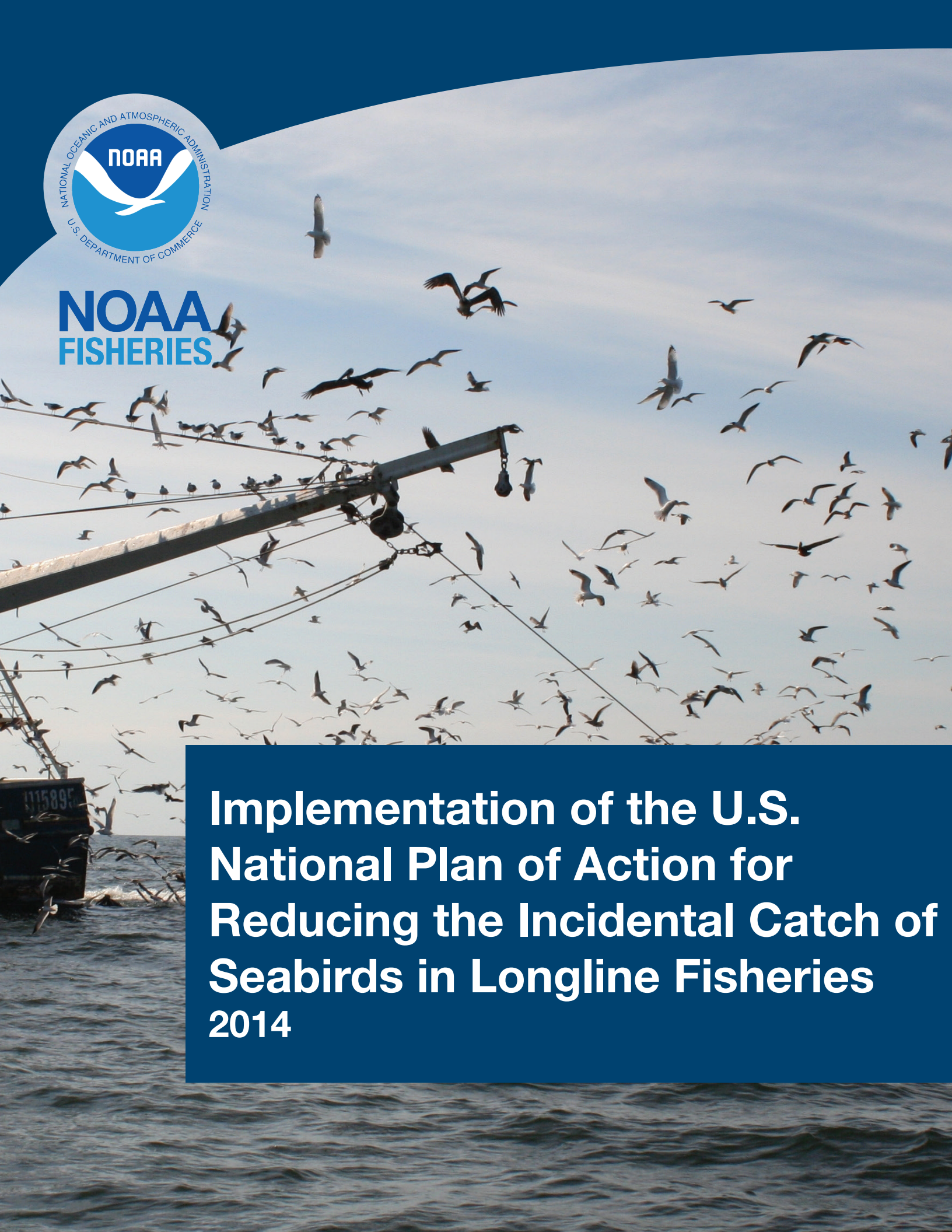

NOAA FISHERIES

Implementation of the U.S. National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries

2014

Implementation of the United States National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries

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Executive Summary

Implementation of the United States National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries highlights advancements made by the United States toward the objectives of the 2001 U.S. *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (NPOA-Seabirds). Since 2001, the United States has improved research, outreach and education on, and domestic management of incidental seabird catch, resulting in a significant decrease in seabird incidental catch in its domestic fisheries.

Interagency collaboration has been a large part of U.S. success in reducing the incidental catch of seabirds. Three different agencies – the National Marine Fisheries Service, the Fish and Wildlife Service, and the Department of State – play roles in implementing the NPOA-Seabirds by seeking to reduce incidental catch through policy development and research, as well as a variety of domestic and international measures. These agencies have made great efforts to coordinate research and action on seabird incidental catch mitigation.

Management measures taken by the United States include the introduction of comprehensive regulations for avoiding the incidental catch of seabirds in a number of domestic fisheries. Such regulations have resulted in a halving of or even tenfold decrease in incidental catch numbers in

certain fisheries. Additionally, the United States actively supports the adoption of seabird management measures in international forums, and is pursuing accession of the Agreement to on the Conservation of Albatrosses and Petrels (ACAP). Finally, the United States has implemented a number of outreach and educational tools to combat seabird bycatch by developing easy reference guides and manuals for fishermen and fisheries observers.

Despite the strides it has made in reducing incidental seabird catch in longline fisheries, the United States recognizes that there are further steps and initiatives it can take. Among these include the recognition that while incidental catch may have decreased in longline fisheries, it is still an issue in gillnet and trawl fisheries. In addition to further research and interagency collaboration, the United States will strive to emphasize the importance of seabird populations in ecosystem-based management systems and continue to promote global seabird conservation through the adoption of international measures.

Introduction

The United States developed the U.S. *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries*[1] (NPOA-Seabirds) in 2001, fulfilling a national responsibility to address incidental seabird catch in longline fisheries as called for in the *International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (IPOA-Seabirds). The NPOA-Seabirds was a multi-agency collaborative effort, involving the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), and the Department of State (DOS). The 2001 NPOA-Seabirds provided an action plan that provides national-level policy guidance on reducing seabird bycatch in U.S. longline fisheries. This action plan included seven elements:

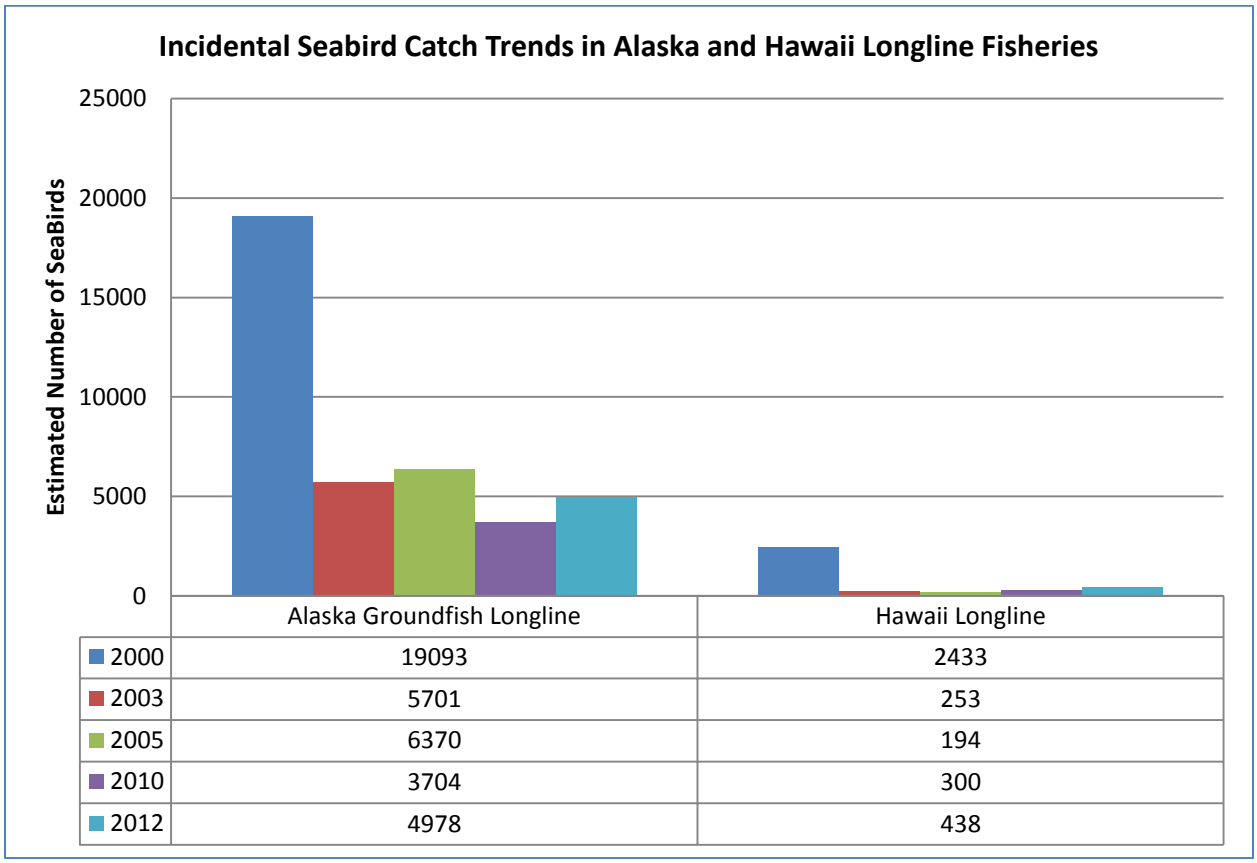
1. Collecting seabird bycatch data
2. Developing proposed time frames for implementing seabird bycatch mitigation measures
3. Developing and evaluating mitigation measures
4. Conducting research on mitigation measures
5. Conducting outreach, education, and training programs to help fishermen avoid and minimize seabird bycatch, and reduce mortality of seabird bycatch that cannot be avoided
6. Developing national and international reporting requirements, and
7. Continued collaboration between NMFS and FWS.

It also requires that NMFS, in cooperation with FWS, conduct an assessment of all U.S. longline fisheries to determine whether a seabird incidental catch problem exists and implement mitigation measures in those fisheries that have an issue. Regional assessments of incidental catch in longline fisheries carried out in the wake of the NPOA's publication led some regions to identify incidental catch issues in their fisheries.[2]

The United States has made a great deal of progress to reduce incidental catch of seabirds since 2001. This report highlights the achievements of the United States in the implementation of the NPOA-Seabirds action plan in the areas of research, U.S. management measures, international

[1] Available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/npoa/npoa.pdf
[2] NMFS regional assessments of seabird bycatch are available in Appendix II at http://alaskafisheries.noaa.gov/protectedresources/seabirds/npoa/npoa.pdf.

agreements, and outreach and education efforts. It also summarizes trends in incidental seabird catch numbers in longline fisheries since 2001 for those fishery regions that have observer coverage and reported fleet-wide estimates. Alaska and Hawaii – regions which identified incidental catch issues in 2001 – have made many advances in reducing the incidental catch of seabirds in longline fisheries.



	Alaska Groundfish Longline	Hawaii Longline
2000	19093	2433
2003	5701	253
2005	6370	194
2010	3704	300
2012	4978	438

Figure 1 Incidental Seabird Catch Trends in the Alaska and Hawaii Longline Fisheries (2000-2012, selected)

The implementation of the NPOA-Seabirds is cross-cutting, involving a number of different agencies. As collaborators on the development of the NPOA, NMFS, FWS, and DOS have the largest roles in implementation. FWS implements aspects of the NPOA-Seabirds through its authority under the Endangered Species Act and Migratory Bird Treaty Act, while DOS has promoted the implementation of the IPOA-Seabirds by encouraging other nations to develop NPOAs and to adopt seabird incidental catch reduction measures in Regional Fishery Management Organizations. NMFS has role in implementing the IPOA due to its authority in managing U.S. fisheries under the Magnuson-Stevens Fishery Conservation and Management Act. The work of these various agencies comes together in a promising course for reduction of incidental catch of seabirds in the United States.

National Seabird Program

In 2001, the same year that the NPOA-Seabirds was published, NMFS established its National Seabird Program (NSP).[3] The NSP is responsible for ensuring that milestones associated with the

[3] Available at http://www.alaskafisheries.noaa.gov/protectedresources/seabirds/national.htm

NPOA-Seabirds, as well as with Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, are accomplished. Its mission is to maintain seabirds as integral components of healthy and resilient ocean ecosystems by conducting research on and mitigating threats to seabirds in the ocean and near-shore environment, and by raising awareness of NMFS seabird-related activities and responsibilities. In doing so, the NSP addresses an array of activities, including monitoring and reducing incidental seabird catch in U.S. marine fisheries, working to reduce seabird interactions in international fisheries, and promoting the importance of seabirds as ecosystem indicators and components of healthy ocean ecosystems. The NSP is also part of an inter-agency team that actively works to support possible accession to the Agreement on the Conservation of Albatrosses and Petrels (ACAP), an international treaty.

The NSP is led by a National Seabird Coordinator who works with seabird points of contact in the NMFS Regional Offices, Science Centers, and headquarters offices, and coordinates with other NOAA offices and Federal agencies. Some examples of NMFS regional programs include:

- Seabird Bycatch Reduction Program[4] in the Alaska Regional Office
- Seabird Fishery Interaction Research[5] at the Alaska Fisheries Science Center (AFSC)
- Seabird Interactions in Hawaii-based Longline Fisheries[6] in the Pacific Island Regional Office (PIRO)
- West Coast Regional Office: California Pelagic Longline Fishery[7] and West Coast Groundfish Fishery[8]

While the NSP monitors agency activities related to seabird conservation and research, there was no formal mechanism in place to fund priority projects in a cohesive and comprehensive manner. NMFS hosted a National Seabird Workshop[9] in September 2009 to initiate the development of a National Seabird Strategic Plan that could serve as such a mechanism. A Strategic Plan could be used to describe NMFS seabird activities and important partnerships with other management agencies; guide NMFS seabird management and science; and provide seabird-related input to NOAA's strategic planning and budgeting process. Workshop participants discussed anthropogenic impacts on seabird populations, possible mitigation measures, interagency coordination with stakeholders on various projects, and the integration of seabirds as indicators of marine health into an ecosystem approach to management.

[4] Available at http://www.alaskafisheries.noaa.gov/protectedresources/seabirds.htm
[5] Available at http://www.afsc.noaa.gov/REFM/REEM/Seabirds/Default.php
[6] Available at http://www.fpir.noaa.gov/SFD/SFD_seabirds.html
[7] Available at http://swr.nmfs.noaa.gov/fmd/longline/Default.htm
[8] Available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/westcoast.htm
[9] Available at http://www.alaskafisheries.noaa.gov/protectedresources/seabirds/presentations/workshop/092009.htm

Workshop[10] participants developed a mission and goals statement for the National Seabird Program:

National Seabird Program Mission:

- Maintain seabirds as integral components of healthy and resilient ocean ecosystems by conducting research on and mitigating threats to seabirds in the ocean and near-shore environment, and by raising awareness of NMFS seabird-related activities and responsibilities.

National Seabird Program Goals:

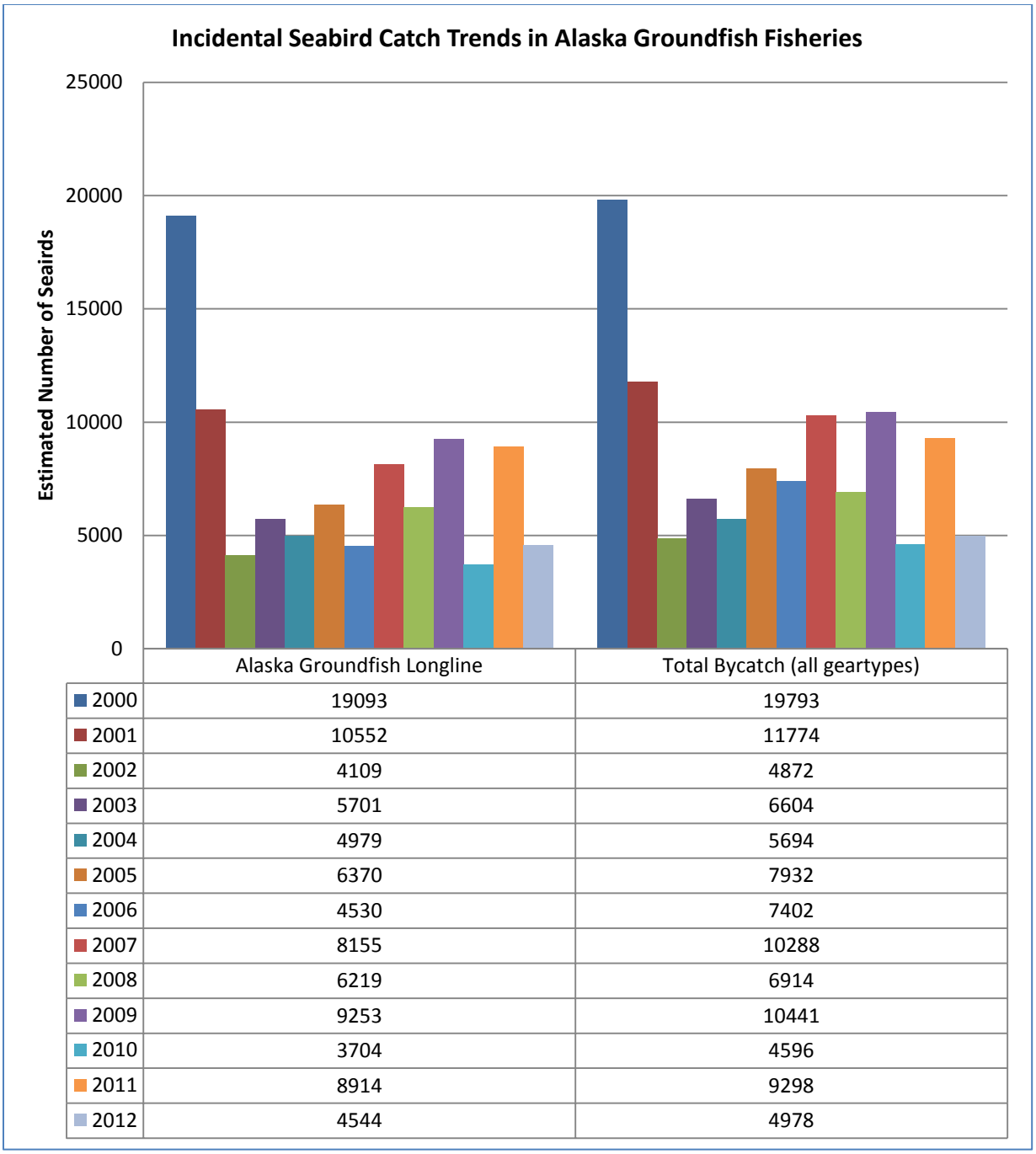
- Quantify, reduce, and mitigate impacts on seabirds due to fisheries.
- Incorporate seabird ecology into NMFS Ecosystem Approach to Management by using seabirds as indicators of ecosystem state, and understanding variation in seabird distribution, abundance, and other biological parameters over space and through time.
- Raise awareness of NMFS seabird research, management, and responsibilities with our partners, constituents, and the general public.
- Develop, implement, and maintain a National Seabird Program strategic plan.
- Support NMFS regional seabird activities through obtaining funding and other resources.
- Facilitate communication among NMFS regional seabird programs to identify issues of common interest and opportunities for collaboration.

Due to efforts by the NSP, commercial fishermen using longline gear in NMFS-managed fisheries off Alaska and off Hawaii employ mandatory seabird avoidance measures to keep seabirds such as albatrosses, shearwaters, and northern fulmars from taking baited hooks or becoming entangled in the fishing gear.

Alaska Incidental Seabird Catch Reduction

NMFS Alaska Region revised existing seabird avoidance gear regulations to include best practices for longline fisheries in 2004. Longline vessels over 26 feet in length are required to use single or paired streamer lines of a specified standard, based on the vessel length, fishing gear used, and area fished. NMFS estimates of seabirds incidentally caught in Alaskan commercial groundfish longline fisheries from 2000-2012 indicate a substantial drop in incidental seabird catch since the longline regulations were put into place. From an estimated incidental catch of over 19,000 individual seabirds in 2000, numbers have since remained below 10,000 individuals in the Alaska's longline fisheries.[11]

[10] The Workshop Report is available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/reports/seabirdworkshoptechmemo.pdf.
[11] Available at http://www.afsc.noaa.gov/REFM/docs/2012/ecosystem.pdf, 171-174.



	Alaska Groundfish Longline	Total Bycatch (all geartypes)
2000	19093	19793
2001	10552	11774
2002	4109	4872
2003	5701	6604
2004	4979	5694
2005	6370	7932
2006	4530	7402
2007	8155	10288
2008	6219	6914
2009	9253	10441
2010	3704	4596
2011	8914	9298
2012	4544	4978

Figure 2 Incidental Seabird Catch Trends in Alaska Groundfish Fisheries (2000-2012)

Additionally, NMFS partners collaboratively on research on seabird-fishery interaction in the Alaska region. Over the years, research has included the development of successful bycatch reduction devices such as streamer lines, establishing a necropsy program to analyze incidentally caught seabirds, and numerous observation surveys. These and other research topics are summarized in the AFSC's quarterly research reports.[12]

[12] Available at http://www.afsc.noaa.gov/Quarterly/quarterly_index6.htm#seabird.

Hawaii Incidental Seabird Catch Reduction

NMFS and the Western Pacific Fishery Management Council manage the two Hawaii longline fisheries under the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region. Since 2001, PIRO has produced an annual report on Seabird Interactions and Mitigation Efforts in Hawaii Longline Fisheries,[13] which summarizes the operations of these fisheries, the mitigation measures used to prevent and reduce seabird interactions, and the observed and estimated seabird interactions. Mandatory seabird mitigation measures became effective in 2002. From a high of 2,433 seabird-fishery interactions in 2000, the mitigation measures have led to a significant decrease in incidental seabird catch.

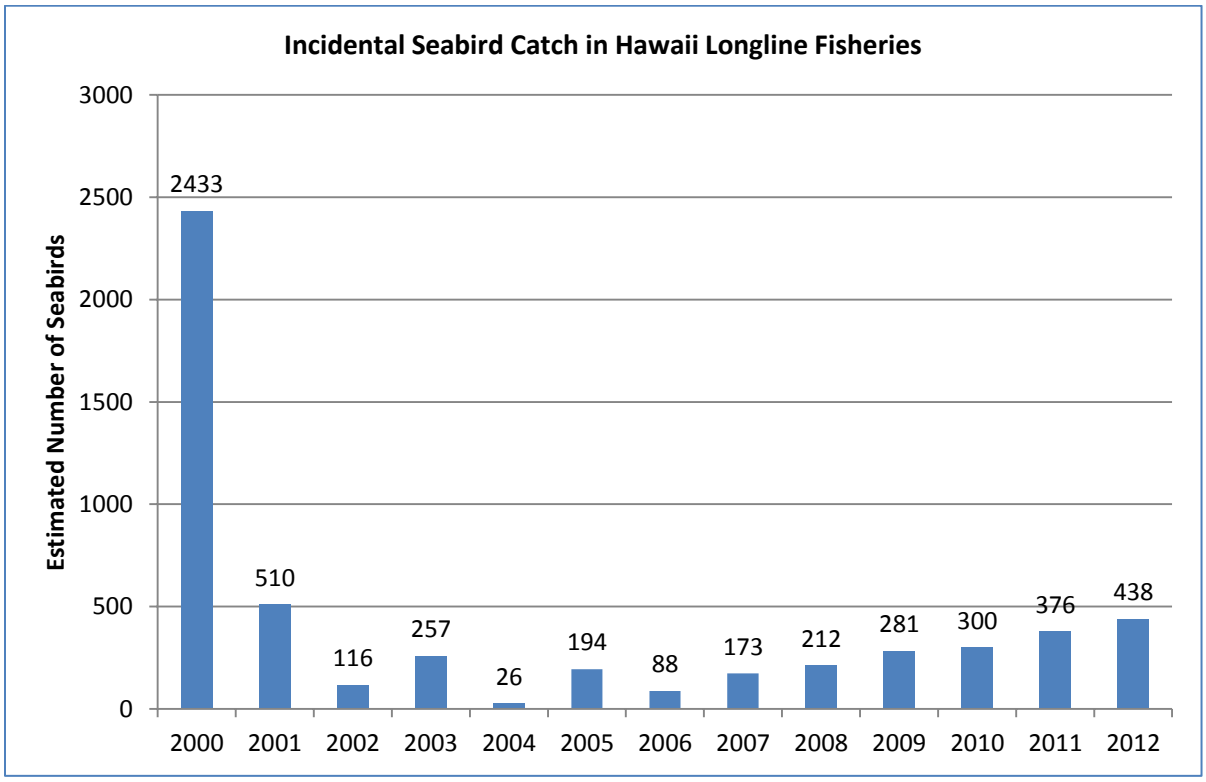


Figure 3 Incidental Seabird Catch Trends in Hawaii Longline Fisheries (2000-2012)

Research Programs and Activities

Research programs carried out by NMFS headquarters, its regional Fisheries Science Centers, and partner organizations have produced valuable information on seabird ecology, habitat, migration patterns, and feeding habits. Additional research and training aims to identify fishing methods that minimize the incidental catch of seabirds and build observer capacity for seabird reporting. This information could then be incorporated into effective seabird incidental catch reductions.

Bycatch Reduction Engineering Program

In 2008, NMFS established the Bycatch Reduction Engineering Program (BREP) as required under Section 316 of the Magnuson-Stevens Fishery Conservation and Management Act. BREP

[13] Available at http://www.fpir.noaa.gov/SFD/SFD_seabirds.html

provides funding for projects that develop technological solutions and investigate changes in fishing practices to minimize bycatch of fish and protected species (including marine mammals, seabirds, and sea turtles), as well as minimize bycatch injury and mortality.[14] Projects are often leveraged with funds from sources outside NMFS and involve partners from other Federal agencies, state governments, nongovernmental organizations, universities, and the fishing industry. From 2004-2007, NMFS used funds from a Reducing Bycatch initiative to fund the NSP. Similar funds have been used from 2012 to present, along with funds from the NMFS National Observer Program. From 2008-2011, BREP provided funding to the NSP and a number of projects examining incidental catch of seabirds and ways to address the incidental catch in a variety of fisheries. Some of the projects are highlighted below.

The **Alaska Fisheries Science Center's** (AFSC) Coordinated Seabird Studies Program (CSSP) addresses seabird interactions with fisheries through a seabird necropsy program, analysis of observer data on seabird mortalities on trawl vessels, analysis of point-count seabird surveys, analysis of longline vessel-specific incidental catch rates[15], documentation of seabird interactions with Alaskan groundfish fisheries, investigation of seabird food habits and attraction to fishery offal, use of stable-isotope analysis of feathers to examine the impact of fisheries on albatross foraging strategies and demographics, and representation of NOAA's seabird work at the First World Seabird Conference in 2010. In 2011, CCSP reported that incidental seabird catch mitigation activities led to 80% and greater reductions in incidental catch in the Alaskan demersal longline fleets.

The Seabirds on the Western North Atlantic and Interactions with Fisheries project was carried out at the **Southeast Fisheries Science Center (SEFSC)**. This project aimed to improve the identification of incidental seabird catch on the Western North Atlantic U.S. pelagic longline fishery where, beginning in 2004, all birds observed caught were identified at least to genus and most to species. The project also worked to improve the estimation of incidental catch of the pelagic longline fleet based on observer reports[16] of seabird interactions and allowed for preparation of the U.S. National Report on Seabird Bycatch of the Western North Atlantic U.S. Pelagic Longline Fishery for the International Commission on the Conservation of Atlantic Tunas (ICCAT).

Below are improved estimates of incidental seabird catch in U.S. Atlantic longline fisheries, which includes the Gulf of Mexico and Western North Atlantic fisheries.

[14] Available at http://www.nmfs.noaa.gov/by_catch/bycatch_BREP.htm
[15] Available at http://docs.lib.noaa.gov/noaa_documents/NMFS/AFSC/AFSC_PR/PR2010-04.pdf
[16] Available at http://www.bioone.org/doi/abs/10.1675/063.034.0304

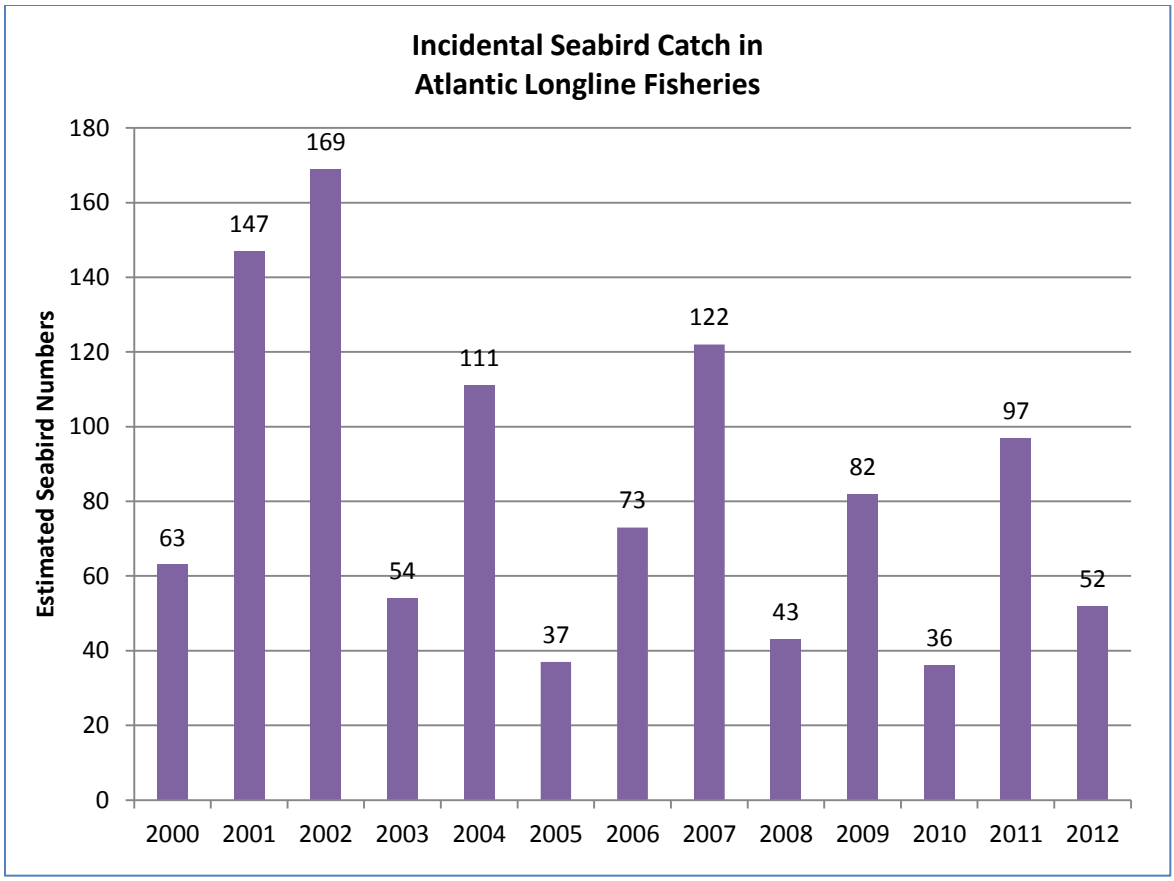


Figure 4 Incidental Seabird Catch in Atlantic Fisheries (2000-2012)[17]

The **Northeast Fisheries Science Center (NEFSC)** undertook a project on estimation of incidental seabird catch in northeast commercial fisheries, which developed methodologies for expansion of observed takes to total takes by fishery and species, looking at fixed and mobile gear fisheries, beginning with the gillnet fishery[18]. The analyses identified fishing practices, gear configurations, and environmental factors associated with high incidental catch rates. During 2012, data from several sources (observer datasets, and Vessel Trip Report and Commercial Landings effort datasets) were collated and synthesized to provide a cohesive dataset that can be used to estimate incidental seabird catch. Efforts to date have documented incidental catch estimates of common and red-throated loons in gillnet fisheries off the U.S. Atlantic coast. Similar efforts are being undertaken to assess the incidental catch of greater shearwaters and northern gannets in gillnet and trawl fisheries.

[17] Li, Y. and Y. Jiao. 2014. Term 2 Progress Report on the Project: Spatial and Temporal Analysis and Prediction of Seabird Bycatch of US Atlantic Pelagic Longline Fleet. Report submitted by Virginia Polytechnic Institute and State University, Blacksburg, Virginia, to the Southeast Fisheries Science Center, NOAA National Marine Fisheries Service, Miami, Florida.

[18] Available at http://www.nefsc.noaa.gov/publications/crd/crd0817/crd0817.pdf and http://www.nmfs.noaa.gov/by_catch/docs/Northeast_region_seabird_gillnets.pdf

The Coastal Observation and Seabird Survey Team (COASST)[19] at the **University of Washington** trains volunteers to collect data on beached birds across over 500 km of coastline in the Pacific Northwest and Alaska at more than 400 sites. The data is used as a baseline against which fishery-associated mortality events can be contrasted and to assess patterns of species-specific entanglement mortality.[20] Additionally, COASST works directly with AFSC to provide seabird identification training for NMFS-certified fishery observers.

The **Northwest Fisheries Science Center (NWFSC)** began a project to develop fisheries-independent marine bird surveys and develop fishery observer capacity to collect such data at sea. In collaboration with Washington Sea Grant, data on seabird distribution has been used to generate maps of overlap between West Coast fisheries and seabirds. These efforts have supported work currently underway by NMFS's West Coast Region and the Pacific Fishery Management Council to propose regulations to minimize the take of the short-tailed albatross and similar species in groundfish fisheries off of the U.S. West Coast.

A study on temporal variations in seabird distribution and density in the Eastern Tropical Pacific was completed in the Hawaiian Archipelago in 2010[21] by the **Southwest Fisheries Science Center (SWFSC)**. In 2011 data was collected in the main Hawaiian Islands and Palmyra Atoll.[22] The project's objective was to collect data on distribution, abundance, and behavior of seabirds in Exclusive Economic Zone waters.

In 2011, **World Wildlife Fund's Smart Gear Initiative** (partially funded by NOAA) awarded the Grand Prize and the Special Tuna Prize to an entry called the Yamazaki double-weight branchline,[23] which is designed to reduce incidental seabird catch in pelagic longline fisheries when used in combination with tori lines and in some cases night-setting. The double-weight configuration is designed to (1) sink pelagic longline hooks beyond the range of seabird attacks within the aerial extent of a tori line during line setting and (2) reduce injuries to crew should a hook come free while under tension in the landing process and recoil back at the vessel.

Development of Best Practices

In 2007, NMFS compiled *Best Practices for the Collection of Longline Data to Facilitate Research and Analysis to Reduce Bycatch of Protected Species*,[24] the report of a workshop at the International Fisheries Observer Conference in 2004. The report concludes with recommended minimum variables to be collected in all longline fisheries. For incidental catch, variables include species identification, number of each species captured, type of interaction (hooking/entanglement), disposition (dead/alive), and description of condition/viability of the animal upon release. For seabirds, the critical variables listed by data users were interaction rate

[19] Available at http://depts.washington.edu/coasst/
[20] Available at http://www.marinemammalcenter.org/assets/pdfs/vetsci-stranding/scientific-contributions/2009/moore-2009-marine-mammal.pdf and http://www.marineornithology.org/PDF/37_1/37_1_41-60.pdf
[21] Available at http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=637&id=16506#
[22] Available at http://www.pifsc.noaa.gov/library/pubs/cruise/Sette/CR1108-AB.pdf
[23] Available at http://assets.worldwildlife.org/publications/613/files/original/winner_tuna_prizes_double_branchline_factsheet_final.pdf?1375482454
[24] Available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/llreport0307.pdf

during deployment, number of seabirds caught by species, location of the hook on the animal, viability of the animal, use of species identification form and/or taking of photographs, whether there was a tag or band on the animal, and gender and age. The results of the workshop were disseminated to observer programs, data users, and regional fisheries management organizations.

Washington Sea Grant Research

Researchers at the Washington Sea Grant have explored various incidental seabird catch mitigation methods in longline as well as gillnet and trawl fisheries – with particular focus paid to Alaska's demersal longline fisheries and now the U.S. West Coast demersal longline fisheries. The Washington Sea Grant has also conducted research in CCAMLR convention area waters and the pelagic longline fisheries of South Africa. Collaborative partners over the years have included Japanese researchers, the South Africa Department of Environmental Affairs and Tourism, and the New Zealand Ministry of Fisheries. Sea Grant researchers developed and tested combined mitigation techniques such as integrated weight longlines with paired streamer lines – determining the combination to be a best practice for avoiding incidental seabird catch in demersal longline fisheries.[25]

U.S. Management Policies and Laws

Another driver for U.S. success since the release of the NPOA in 2001 is the adoption and use of different management policies and laws. In addition to executive orders and formal collaborations at the agency level, Federal agencies have also utilized provisions of preexisting domestic law to address incidental seabird catch to promulgate regulations putting management measures in places.

Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186,[26] signed in 2001, directs executive departments and agencies to take actions to promote the conservation of migratory bird populations. The Executive Order calls on Federal agencies to, among other things, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts and guidance from sources including the IPOA-Seabirds, Partners-in-Flight, U.S. National Shorebird Plan, North American Waterfowl Management Plan, and North American Colonial Waterbird Plan.

The Council for the Conservation of Migratory Birds[27] is an interagency group established in 2009 by the Secretary of the Interior, and chaired by the Director of FWS, that oversees implementation of Executive Order 13186. The Council released a report in 2011,[28] which describes agencies' accomplishments related to migratory bird conservation, including seabird conservation work by NMFS.

[25] All research available at http://www.wsg.washington.edu/mas/resources/seabird.html
[26] Available at http://www.fws.gov/migratorybirds/Partnerships/migbrdeo.pdf
[27] Available at http://www.fws.gov/migratorybirds/CCMB.htm
[28] Available at http://www.fws.gov/migratorybirds/pdfs/Council%20reportfinal2011.pdf

Memorandum of Understanding between NMFS and FWS to Protect Migratory Birds

An example of interagency cooperation on seabird conservation in the United States is the signing by NMFS and FWS of a Memorandum of Understanding (MOU)[29] on July 17, 2012 to promote the conservation of migratory birds, as required by Executive Order 13186. This NMFS–FWS MOU encompasses all relevant seabird-related NMFS activities and identifies specific areas of collaboration and cooperation with FWS, including incidental seabird catch reduction, habitat conservation, information sharing and coordination, and international policy. The MOU also aims to strengthen conservation of migratory birds and their habitat and reduce adverse impacts on migratory birds through enhanced collaboration between NMFS and the FWS. These activities are intended to complement and support existing efforts and to facilitate new collaborative conservation efforts for seabirds and other migratory birds.

Endangered Species Act (ESA)

The Endangered Species Act[30] requires the Federal government to protect and recover imperiled species, as well as the habitats upon which they depend. The statute requires species to be listed as "threatened" or "endangered" on the basis of their biological status and threats to their existence. It also requires that Federal agencies conduct "consultations" (ESA Section 7) to ensure that the effects of the projects they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species. FWS develops Biological Opinions under Section 7 of the ESA to assess the impact of proposed activities on ESA-listed migratory bird species. FWS also develops "recovery plans" that describe necessary steps for restoring a species to ecological health.

Migratory bird species that come under the purview of the Endangered Species Act include seabirds that may interact with U.S. fisheries. In 2003, FWS made available a recovery plan for the Alaska-breeding population of the threatened Steller's eider.[31] In 2009, FWS released a final recovery plan and initiated a 5-year status review for the endangered short-tailed albatross.[32] FWS listed the Chatham petrel, Fiji petrel, and magenta petrel in 2009[33] and Galapagos petrel and Heinroth's shearwater in 2010[34] as endangered throughout their ranges. Biological Opinions related to bird species have been completed for short-tailed albatross, Steller's and spectacled eider, marbled murrelet, and California least tern in Alaska, Hawaii, and West Coast fisheries.[35]

Federal Fishing Regulations

Under the Magnuson-Stevens Fishery Conservation and Management Act, the principal law governing marine fisheries in the United States, regional Fishery Management Councils work in partnership with Federal fisheries managers to prepare Fishery Management Plans (FMPs) for the management of marine fish stocks in their respective geographic areas. NMFS then issues

[29] Available at http://www.alaskafisheries.noaa.gov/notice/77fr60381.pdf and http://alaskafisheries.noaa.gov/protectedresources/seabirds/mou/eo13186_nmfs_fws_mou2012.pdf
[30] Available at http://www.fws.gov/endangered/laws-policies/
[31] Available at http://ecos.fws.gov/docs/federal_register/fr4083.pdf
[32] Available at http://www.fws.gov/policy/library/2009/E9-11700.pdf
[33] Available at http://www.fws.gov/policy/library/2009/E9-22033.pdf
[34] Available at http://www.fws.gov/policy/library/2010/E9-31308.pdf
[35] Available at http://www.alaskafisheries.noaa.gov/protectedresources/seabirds/national.htm

regulations to implement the Plans.[36] In accordance with these FMPs, NMFS has promulgated regulations requiring incidental seabird catch mitigation measures for a number of regions. Any person who is found after notice and a hearing to have violated fishery management regulatory measures are liable for civil penalties up to $100,000 (16 U.S.C. 1848(a)).

Alaska Fisheries

Regulations promulgated for the North Pacific Fishery Management Council region (Fisheries of the Exclusive Economic Zone off Alaska, 50 CFR 679[37]) include relevant sections on seabirds such as: definition of avoidance gear and seabirds (§679.2); seabird avoidance program for vessels fishing with hook-and-line gear (§679.24); seabird avoidance requirements for Community Development Quota (§679.32); seabird avoidance gear and methods for Individual Fishing Quota (§679.42); vessel responsibilities for collecting all seabirds that are incidentally taken (§679.51); seabird avoidance gear requirements for vessels, based on area, gear, and vessel type (Table 20). Most vessels using hook-and-line gear (i.e. longline) are required to use single or paired streamer lines of a specified design.

Western Pacific Fisheries

Regulations for the Western Pacific Fishery Management Council region (50 CFR 665)[38] include detailed incidental seabird catch mitigation measures in pelagic longline fisheries (§665.815). Accordingly, Hawaii longline fishermen must utilize a suite of mitigation methods depending on whether they use shallow or deep setting methods (for swordfish or tuna) and whether they set gear off the stern or the vessel side. Required mitigation measures include weighted branchlines, blue-dyed baits, strategic offal discard, night-setting, and specific baits for operations with swordfish as the target species.[39] Fishermen must also follow safe handling guidelines if a seabird is incidentally caught.

West Coast Fisheries

The Pacific Fishery Management Council's proposed regulations (50 CFR 660)[40] to include seabird mitigation measures for longline fisheries. In 2004, the regulations implementing the Fishery Management Plan for U.S. West Coast fisheries for Highly Migratory Species were revised to require fishermen using longline gear to employ mitigation techniques such as weighted branchlines, blue-dyed baits, and strategic offal discard to reduce their interactions with seabirds (660.712). In addition, the Pacific Fishery Management Council adopted measures to require groundfish fishermen in vessels over 55 feet in length to deploy streamer lines. Those measures are expected to be in effect during the 2014 calendar year.

National Bycatch Strategy

First developed in 2003, the NMFS National Bycatch Strategy[41] aims to:

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[36] More information on and the full text of the Magnuson-Stevens Act is available at http://www.nmfs.noaa.gov/msa2007/

[37] Available at http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title50/50cfr679_main_02.tpl

[38] Available at http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title50/50cfr665_main_02.tpl

[39] A quick guide to mitigation measure requirements for fishermen is available at http://www.fpir.noaa.gov/SFD/pdfs/HI%20LL%20Seabird%20Regulations%20Quick%20Guide%20-%20July%202010.pdf.

[40] Available at http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title50/50cfr660_main_02.tpl

[41] Available at http://www.nmfs.noaa.gov/by_catch/docs/National_Bycatch_Strategy2003.pdf

1) Assess progress toward meeting the national bycatch goal, which includes meeting the bycatch reduction requirements under the Magnuson-Stevens, Marine Mammal Protection, and Endangered Species Acts;
2) Develop a national approach to a standardized bycatch reporting methodology;
3) Implement the national bycatch goal through regional implementation plans;
4) Undertake education and outreach involving cooperative efforts to develop effective and efficient methods for reducing bycatch;
5) 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; and
6) Identify new funding requirements to effectively support the Strategy on an ongoing basis.

The Strategy specifically calls for regional reports that suggest ways to reduce takes of migratory seabirds. Several papers have been published analyzing the U.S. approach to addressing bycatch.[42] Action items and progress updates are available from each region for 2010-2011[43] and include work on reducing incidental catch of seabirds.

The 2011 National Bycatch Report[44] provides the first national compilation of bycatch estimates for living marine resources managed by NMFS. NMFS prepared the report to evaluate the extent to which reliable quantitative bycatch information exists for Federally managed commercial fisheries and fisheries with relevant Federal data-collection programs- The report also documents bycatch estimates for all fisheries for which this information was available in 2005. In addition, this report establishes a baseline for tracking changes in bycatch over time and is designed to assist NMFS in meeting legislative mandates for bycatch reduction, guiding policy, and setting priorities.

The 2008 FWS Birds of Conservation Concern[45] (BCC) lists seabird species of management importance and are used in the National Bycatch Report to evaluate potential incidental catch problems and stock/population status for key stocks. The report names seabird populations listed by the Endangered Species Act, as well as key populations noted in the BCC, along with population status and whether they are an incidental catch concern. Finally, the National Bycatch Report includes a national overview of incidental seabird catch for 25 fisheries, with data presented by region. A final draft update of the report was released with data through 2010.[46] This update contains incidental seabird catch data by fishery for each region.

International Fishery Management Measures

The United States continues to promote global seabird conservation by supporting the development and implementation of incidental seabird catch mitigation measures in regional

[42] Available at http://www.nmfs.noaa.gov/by_catch/SPO_final_rev_12204.pdf and http://spo.nmfs.noaa.gov/mfr662/mfr6621.pdf
[43] Available at http://www.nmfs.noaa.gov/by_catch/bycatch_strategy.htm
[44] Available at http://www.nmfs.noaa.gov/by_catch/bycatch_nationalreport.htm
[45] Available at http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf
[46] Available at http://www.st.nmfs.noaa.gov/observer-home/finaldraftnbr

fisheries management organizations and bodies. The United States also works bilaterally to develop and promote conservation and management measures addressing incidental catch of seabirds. The United States has engaged on seabird issues bilaterally with Chile, Japan, Mexico, Norway, and Russia.

The United States has played a key role in the adoption of binding and nonbinding conservation measures related to seabirds in a number of regional fisheries management organizations[47] to which the United States is Party, as well as in other international fora, including the following:

- Agreement on the Conservation of Albatrosses and Petrels (ACAP)
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- Inter-American Tropical Tuna Commission (IATTC)
- International Commission for the Conservation of Atlantic Tunas (ICCAT)
- Western and Central Pacific Fisheries Commission (WCPFC)
- South Pacific Regional Fisheries Management Organization (SPRFMO)
- FAO Committee on Fisheries (COFI)
- United Nations General Assembly (UNGA)
- International Council for the Exploration of the Sea (ICES)
- Arctic Council Program for the Conservation of Arctic Flora and Fauna (CAFF)

Agreement on the Conservation of Albatrosses and Petrels (ACAP)

Formed under the auspices of the Convention on Migratory Species, ACAP came into force in February 2004 and currently has 13 member countries, covering 30 species of albatrosses, petrels and shearwaters. The ACAP Secretariat is active within RFMOs, providing technical assistance and expert advice regarding minimization of incidental catch of albatrosses and petrels in high seas longline and trawl fisheries. In 2009, ACAP added the three North Pacific albatross species to Annex 1 of the Agreement, which lists all the albatross and petrel species to which ACAP applies. In 2011, the Seabird Bycatch Working Group and the Advisory Committee undertook a major revision of ACAP's pelagic longline mitigation advice. Best practice measures in the updated advice include using a combination of branchline weighting, night setting, and streamer lines. The advice for streamer lines is now split between vessels less than 35m and those greater than 35m to reflect operational differences. The Working Group also recommended technical specifications for each measure. In 2012, the Balearic Shearwater was added to Annex 1 of the Agreement.

The United States, via NOAA, the U.S. Department of State, and the U.S. Fish and Wildlife Service, has participated in ACAP meetings as an Observer due to its interest in seabird conservation, its status as a Range State under ACAP, and as a result of the inclusion of the three North Pacific albatross species as ACAP species. NMFS participates on the established Seabird Bycatch Working Groups as an invited expert and has been attending since this group's first meeting in 2007. This participation has granted the United States influence over some ACAP proceedings, although only full Parties have voting rights and the ability to Chair any of ACAP's

[47] A full list of seabird conservation and management measure in RFMOs can be found at http://www.nmfs.noaa.gov/ia/species/seabirds/RFMO/seabirds_rfmos.html

working groups or propose amendments to the Agreement. The United States is pursuing accession to the Agreement.

Food and Agriculture Organization of the United Nations Committee on Fisheries (COFI)

The FAO's COFI developed the International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries in1998 that pushed the creation of the corresponding U.S. NPOA in 1998. Since then, the COFI also developed Best Practice Technical Guidelines[48] to reduce the incidental catch of seabirds in other fisheries besides longline. The Guidelines represent a baseline that all NPOAs should strive to meet for longline, trawl, and gillnet fisheries.

Program for the Conservation of Arctic Flora and Fauna (CAFF)

FWS scientists are a part of the CAFF Circumpolar Seabird Expert Group (CBird),[49] which facilitates seabird conservation, management and research activities between circumpolar countries, and works to improve communication between seabird scientists and managers. Conservation issues include exotic predators, habitat alteration, oil and contaminants pollution, incidental seabird catch, subsistence harvesting, unregulated harvesting, and climate change. Further, CBird promotes conservation of seabirds outside the Arctic, coordinates research efforts with other seabird groups, and coordinates the circumpolar seabird monitoring network, in addition to developing seabird initiatives for CAFF. CBird has four products coming out in the near future: (1) Circumpolar Seabird Monitoring Framework, (2) Circumpolar Seabird Monitoring Plan, (3) International Ivory Gull Conservation Strategy and (4) Harvest of Seabirds in the Arctic.

FWS is also a partner of the Seabird Information Network, a group of circumpolar seabird researchers that focuses on the development of an online data entry and analysis system on seabird populations. The Network aims for scientists and monitoring systems in Arctic countries to contribute, map, and share information to help assess circumpolar seabird populations.[50]

Outreach, Education, Scientific Papers, and Manuals

Throughout the United States, NMFS and partner institutions have developed tools to aid fishermen and observers with seabird identification, understanding seabird regulations, and reporting seabird sightings as observers. A number of guides, videos, research papers and manuals are available that are regionally specific and address best practices for incidental catch mitigation.

Guides and educational tools

- Seabird Bycatch Reduction Program Guide for Alaska Fishermen[51]
- Off the Hook: an informational video for longline fishermen in Alaska[52]
- Hawaii Longline Seabird Regulations Quick Guide[53]

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[48] Available at http://www.fao.org/docrep/015/i1145e/i1145e00.htm.
[49] Available at http://caff.arcticportal.org/expert-groups
[50] More information on the Seabird Information Network available at http://www.caff.is/seabirds-cbird/seabird-information-network
[51] Available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/guide.htm
[52] Available at http://www.wsg.washington.edu/mas/resources/seabirdvideo.html

- A Fisherman's Guide to Hawaii's Seabirds[54]
- Seabird Compliance Guide for Hawaii fishermen[55]
- Side Setting Brochure for Hawaii[56]
- Pacific Islands Region Seabird Guide[57]
- Hooked Seabird Handling Guidelines for the Southwest[58]
- Seabirds factsheet for the Southeast[59] including guidelines for accidentally hooked seabirds
- Bycatch Mitigation Fact Sheet- Pelagic Longline: Streamer lines[60]
- Identification, Handling, and Release of Protected Species[61]

These resources act as quick references for fishermen and members of the public and are especially useful for those who are not familiar with seabird regulations or biology. As they are freely available on NMFS websites, fishermen may print out copies to use as references on their vessels.

Scientific Papers

In the nearly 13 years since the development of the NPOA-Seabirds, there has been a marked increase in the amount of research and publications on incidental seabird catch. NMFS has been involved with much of this research in some capacity – whether through authorship by NMFS scientists, direct funding, or incorporating the research in its own work. An incomplete list of scientific publications that have a clear nexus to U.S. fisheries and NMFS activities is detailed in the Appendix.

Observer manuals and data collection

Observer manuals from each region provide information on collecting seabird data:

- NEFSC- Marine mammal, sea turtle, and seabird incidental take log[62]
- NWFSC- Seabird data collection[63]
- SWR- Seabird information collected throughout[64]
- SEFSC- Seabird incidental take form[65]
- AFSC- Bird sightings and interactions[66]

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[53] Available at http://www.fpir.noaa.gov/SFD/pdfs/HI%20LL%20Seabird%20Regulations%20Quick%20Guide%20-%20July%202010.pdf
[54] Available at http://www.fpir.noaa.gov/SFD/pdfs/NOAA%20Seabird%20Brochure.pdf
[55] Available at http://www.fpir.noaa.gov/SFD/pdfs/Compliance%20Guide%20Seabird%20(rev.%207-23-10).pdf
[56] Available at http://www.fpir.noaa.gov/SFD/pdfs/seabird/Side-Setting%20Brochure%20(2005-02).pdf
[57] Available at http://www.fpir.noaa.gov/SFD/SFD_seabird_guide.html
[58] Available at http://swr.nmfs.noaa.gov/hshg.htm
[59] Available at http://www.alaskafisheries.noaa.gov/protectedresources/seabirds/SEFSC04seabirds_rev1mm.pdf
[60] Available at http://www.wsg.washington.edu/mas/pdfs/PelagicStreamerLines.pdf
[61] Available at http://www.fpir.noaa.gov/SFD/pdfs/Placards%20English%20Sept%202010%20FNL.pdf
[62] Available at http://www.nefsc.noaa.gov/fsb/manuals/2013/NEFSC_Observer_Program_Manual.pdf
[63] Available at http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_collection/manuals/cs_manual_2013/CS_2013_Chapter_8.pdf
[64] Available at http://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/SWR_Observer_Field_Manual_2006_Withou_%20Appendices1.pdf
[65] Available at http://www.sefsc.noaa.gov/docs/bird_bycatch_form.pdf
[66] Available at http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2013.pdf

- PIRO- Seabird mitigation techniques, Seabird biological data form[67]
- Short-tailed albatross encounter reporting form, FWS[68]
- Short-tailed albatross recovery data form, NMFS[69]

Regional Fisheries Science Centers release observer field manuals for those working in their regional waters. The manuals contain detailed instructions on what information observers should record when encountering incidentally caught seabirds as well notes on the priorities for observers recording data. In general manuals task observers with recording information on endangered and threatened seabird species, with taking information on non-threatened species as time allows.

Reflecting comparative numbers of seabird-fishery interactions, the Alaska, Pacific Islands, Northwest, and Southwest Fisheries Science Centers release detailed observer manuals – with Alaska's manual containing the most information and requiring the most amount of data recording. By contrast, the Southeast Fisheries Science Center provides a seabird incidental take form, but no further details or information on the prevalence of incidental seabird catch for observers.

Future Initiatives to Further Reduce Incidental Catch of Seabirds

Since the development of the NPOA-Seabirds in 2001, the United States has made great progress in reducing incidental catch of seabirds and continues to strive for better management and bycatch avoidance. It is U.S. policy to reduce all bycatch to the lowest levels practicable. While a comprehensive Seabird Strategic Plan has not yet been finalized, several themes emerged from the National Seabird Workshop in 2009 which reflect agency goals and future initiatives for continuing to implement the NPOA and further reduce incidental catch of seabirds.

First and foremost, the United States continues to work on incidental seabird catch issues by conducting regular seabird incidental catch assessments and developing further measures to reduce incidental catch. The National Seabird Program plans to maintain current and form new collaborative networks between various Federal agencies. As part of interagency collaboration, the NSP aims to create a multi-agency inventory of spatial/temporal coverage of existing seabird data and data collection methods. Such a database would include information on geographic region, species, years, incidental catch data, and seasons for which seabird data were available and a listing of the general types of data. In addition to providing an inventory of available data, this database would be valuable in identifying data gaps.

Additionally, NMFS scientists will continue to integrate seabird data into ecosystem-based approaches to management. Integrated national and international partnerships can advance ecosystem modeling and further incidental catch reduction efforts – which in turn could be used

[67] Available at http://www.fpir.noaa.gov/Library/PUBDOCs/observer_manual_forms/obs_hawaii/obs_hi_manual_feb_2013.pdf
[68] Available at http://alaskafisheries.noaa.gov/protectedresources/seabirds/repform.pdf
[69] Available at http://www.fpir.noaa.gov/SFD/pdfs/0456%20Short-tailed%20Albatross%20Recovery%20Data%20Form.pdf

in predictive climate and ecological models, stock assessments, off-site mitigation efforts, and global marine assessments. NMFS will also continue to release annual national and regional data and progress reports. NMFS scientists also hope to incorporate seabirds into NMFS's annual national and regional strategic plans.

Moving forward, it is also important to recognize the impact of gear types other than longlines on seabirds. Though incidental catch by longlines has decreased dramatically in the years since the NPOA was developed, incidental catch issues in trawl and gillnet fisheries have also come to light. Additionally, there is also incidental seabird catch during haulback of the longline, an issue on which current regulations do not focus. These are issues which the National Seabird Program will continue to focus on through research and management in future years.

Finally, the United States continues to play an active role in promoting global seabird conservation and reduction of incidental catch. For example, the United States proposes and supports seabird measures in various RFMOs. Additionally, accession to ACAP is a priority for the current administration. Federal agencies prepared for the potential future ratification of ACAP by drafting implementing legislation. The draft legislation would implement ACAP obligations and authorizes a suite of enforcement tools.

Appendix

Scientific Papers and Reports Related to NPOA-Seabirds

Arata J. A., P. R. Sievert, and M. B. Naughton. 2009. Status Assessment of Laysan and Black-footed Albatrosses, 1923-2005. U.S. Geological Survey, Reston, Virginia. Available: http://pubs.usgs.gov/sir/2009/5131/pdf/sir20095131.pdf.

Brothers N. and E. Gilman. 2006. Technical Assistance for Hawaii Pelagic Longline Vessels to Change Deck Design and Fishing Practices to Side Set. Available: http://alaskafisheries.noaa.gov/protectedresources/seabirds/sidesetassistancefinal.pdf.

Dietrich K. S., E. F. Melvin, and L. Conquest. 2008. Integrated weight longlines with paired streamer lines – Best practice to prevent seabird bycatch in demersal longline fisheries. Biological Conservation 141:1793-1805.

Fischer K.N., R.M. Suryan, D.D. Roby, and G.R. Balogh. 2009. Post-breeding season distribution of black-footed and Laysan albatrosses satellite-tagged in Alaska: Inter-specific differences in spatial overlap with North Pacific fisheries. Biological Conservation 142:751-760.

Gilman E., M. Chaloupka, B. Wiedoff, and J. Willson. 2014. Mitigating Seabird Bycatch during Hauling by Pelagic Longline Vessels. PLoS (Public Library of Science) One 9(1). DOI: 10.1371/journal.pone.0084499.

Gilman, E., N. Brothers, and D. R. Kobayashi. 2007. Comparison of three seabird bycatch avoidance methods in Hawaii-based pelagic longline fisheries. Fisheries Science 73:208-210.

Guy T.J., S.L. Jennings,1, R.M. Suryan, E.F. Melvin, M.A. Bellman, L.T. Balance, B.A. Blackie, D.A. Croll, T. Deguchi, T.O. Geernaert, R.W. Henry, M. Hester, K.D. Hyrenbach, J. Jahncke, M.A. Kappes, K. Ozaki, J. Roletto, F. Sato, W.J. Sydeman, and J.E. Zamon. 2013. Overlap of North Pacific albatrosses with the U.S. west coast groundfish and shrimp fisheries. Fisheries Research 147:222-234.

Hall M., H. Nakano, S. Clarke, S. Thomas, J. Molloy, S.H. Peckham, J. Laudino-Santillán, W.J. Nichols, E. Gilman, J. Cook, S. Martin, J.P. Croxall, K. Rivera, C.A. Moreno, and S.J. Hall, editors. Chapter 8 – Working with Fishers to Reduce by-catches; 8.7 case study 6—working with Hawaii-based longline fishers to abate fisheries by-catch by Gilman E., J. Cook, and S. Martin; 8.8 case study 7—seabird by-catch mitigation: the Southern Ocean (CCAMLR) experience by Croxall J. P., K. Rivera, and C. A. Moreno. Pages 235-288 *in* S. J. Kennedy, editor. 2007. By-catch reduction in the world's fisheries. Springer, New York.

Lokkeborg S. 2011. Best practices to mitigate seabird bycatch in longline, trawl and gillnet fisheries – efficiency and practical applicability. Marine Ecology Progress Series 435:285-303.

McElderry, H., J. Schrader, D. McCullough, J. Illingworth, S. Fitzgerald, and S. Davis. 2004. Electronic Monitoring of Seabird Interactions with Trawl Third-wire Cables on Trawl Vessels – A Pilot Study; NOAA Technical Memorandum NMFS-AFSC-147. Available: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-147.pdf.

Melvin E.F., T.J. Guy, and L.B. Read. 2014. Best practice seabird bycatch mitigation for pelagic longline fisheries targeting tuna and related species. Fisheries Research 149:5-18.

Melvin, E.F., and J.K. Parrish, K.S. Dietrich, and O.S. Hamel, 2001. Solutions to seabird bycatch in Alaska's demersal longline fisheries. Washington Sea Grant Program. Project A/FP-7. Available: http://wsg.washington.edu/communications/online/seabirds/seabirdpaper.html.

Piatt J.F. et al. 2006. Predictable hotspots and foraging habitat of the endangered short-tailed albatross (*Phoebastria albatrus*) in the North Pacific: Implications for conservation. Deep-Sea Research II 53:387-398.

Warden, M. 2010. Bycatch of wintering common and red-throated loons in gillnets off the USA Atlantic coast, 1996–2007. Aquatic Biology 10:167-180. Available: http://alaskafisheries.noaa.gov/protectedresources/seabirds/papers/warden_2010_bycatch_loons.pdf.

Zador S.G., A.E. Punt, and J.K. Parrish. 2008. Population impacts of endangered short-tailed albatross bycatch in the Alaskan trawl fishery. Biological Conservation 141:872-882.