



National Plan *of Action for* Reducing *the* Incidental Catch *of* Seabirds *in* Longline Fisheries

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1. INTRODUCTION

1.1 Purpose

The purpose of this document is to present Canada's national plan for reducing the incidental catch of seabirds within Canadian longline fisheries. Globally, the impact of Canada's longline fisheries on global incidental catch of seabirds tends to be low. Nevertheless, measures have been and continue to be implemented to reduce seabird bycatch in longline fisheries.

Canada's *National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries* (NPOA-Seabirds) was developed in accordance with the principles and provisions of the *International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries* (IPOA-Seabirds), as developed by United Nations Food and Agriculture Organization (FAO).

This document provides an assessment of bycatch levels of seabirds within Canada's longline fisheries, identifies priorities for the NPOA, highlights Canada's current legislative framework and international commitments, reviews Canada's integrated fisheries management framework, and presents a series of actions for better identifying bycatch levels and further enhancing efforts to reduce the incidental capture of seabirds.

1.2 Overview of Longline Fishing and the Incidental Catch of Seabirds

Growing international concerns about the incidental catch of seabirds have given rise to regional and global actions to reduce the problem. During setting and retrieval of longline gear, foraging seabirds may feed on bait deployed on hooks and become hooked either on the body or bill, and thereby drown when the gear goes underwater. Variations in gear configuration and operation affect the rate of incidental catch, including the time of day or time of year that gear is set, the use of bird scaring lines and strategic discharge of offal. For at least 15 years, the impact of the incidental catch of seabirds has raised international concerns and mitigative actions have been initiated regionally and globally to reduce the problem, particularly in the Southern Ocean and Northeast Pacific.

Longline gear is composed of baited hooks attached to a mainline with snoods (i.e., short lengths of line that lead out from the mainline). A longline fishing vessel can operate from a few hundred up to 40,000 hooks per day. The gear may be set at the seabed (demersal longlining), float off the bottom at variable depth (semi-pelagic longlining) or be suspended from a line drifting freely at the surface (pelagic longlining). For pelagic longlines, there are about 3,000 baited hooks per set on mainlines that can be over 100 kilometres in length. In contrast, demersal longlines deploy up to 20,000 hooks per set on a mainline that is approximately 15 km in length, although these configurations vary greatly depending on the directed fishery.

It should be noted, however, that there is no direct correlation between the numbers of hooks in the water and the rate of incidental capture. The type of gear used (pelagic gears tend to capture birds more readily), the time of day for setting, and the season and area fished all affect seabird catch rate. Therefore, the effectiveness of a mitigation measure in reducing incidental bycatch may vary depending upon the context.

Incidental mortality of seabirds by pelagic and demersal longline fishing has been well documented around the world. While data on the incidental catch of seabirds are lacking for a number of longline fisheries, of the 61 seabirds species known to be affected by the global longline fishery, 23 are considered

threatened by the World Conservation Union (IUCN). Species most commonly taken are the albatrosses, petrels, shearwaters, gulls and skuas. Of the 53 albatross populations for which the current conservation status is known, all are now known to be at risk. Incidental capture of seabirds by longlining remains an important factor contributing to these declines.

1.3 Origin and Purpose of IPOA-Seabirds

The IPOA-Seabirds was developed by the FAO in accordance with its 1995 Code of Conduct for Responsible Fisheries. The objective of the IPOA-Seabirds is to reduce the incidental catch of seabirds in longline fisheries where it occurs.

The IPOA-Seabirds applies to States in the waters of which longline fisheries are being conducted by their own or foreign vessels and States that conduct longline fisheries on the high seas and in the exclusive economic zones (EEZ) of other States. The IPOA-Seabirds provides the framework for the development of voluntary National Plans of Action for Reducing the Incidental Catch of Seabirds.

The IPOA-Seabirds indicates that “States with longline fisheries should conduct an assessment of these fisheries to determine if a problem exists with respect to incidental catch of seabirds.” If a problem does exist, then the State should adopt and maintain an NPOA-Seabirds.

1.4 Canadian Legislative and Regulatory Framework

There are a number of legislative measures, enacted by the Government of Canada, that are relevant to reducing the incidental capture of seabirds. Canada’s approach to managing its fisheries and oceans resources is based on a commitment to ecological sustainability, integrated fisheries management, and the precautionary approach. The legislative instruments related to fisheries management include:

- *Department of Fisheries and Oceans Act*;
- *Oceans Act*; and
- *Fisheries Act*.

These instruments are used broadly to manage fishing in Canada, which can contribute to the incidental take of seabirds depending on the time, location or conditions of fishing activities.

With respect to the protection of migratory bird species in Canada, including seabirds, the following legislative instruments apply:

- *Department of Environment Act*;
- *Migratory Bird Convention Act*;
- *Canada Wildlife Act*; and
- *Species at Risk Act*.

These legislative instruments, along with the policies and programs that support them, are consistent with the principles of the IPOA-Seabirds and the FAO Code of Conduct for Responsible Fisheries. They are informed by the precautionary approach in which it is realized that uncertainties exist within the fishery and state of knowledge, and that risk management measures must be followed to reduce the risks to the sustainability of the fish stocks, related fisheries and their ecosystems.

1.4.1 Department of Fisheries and Oceans Act

The *Department of Fisheries and Oceans Act* establishes the powers, duties, and functions of the Minister of Fisheries and Oceans Canada (DFO), which extend to and include all matters over which Parliament has jurisdiction relating to:

- seacoast and inland fisheries;
- fishing and marine sciences; and
- the coordination of the policies and programs of the Government of Canada respecting oceans.

1.4.2 Oceans Act

The *Oceans Act* gives the Minister of DFO the legal authority to bring together all of Canada's oceans stakeholders to develop an oceans management strategy based on the sustainable development and integrated management of activities and resources in estuarine, coastal, and marine waters. Marine protected areas can also be designated through regulations under this legislation.

This *Act* also defines Canada's maritime zones, including its territorial sea and contiguous zone, its EEZ and its continental shelf. The *Act* affirms the sovereign rights and jurisdiction of Canada over its EEZ and the sovereign rights of Canada over its continental shelf consistent with the 1982 United Nations Convention on the Law of the Sea. Finally, the *Act* holds that conservation based on an ecosystems approach is of fundamental importance to maintaining biological diversity and productivity in the marine environment.

1.4.3 Fisheries Act

The *Fisheries Act* is the cornerstone of Canada's fisheries management policy, providing broad powers to the Minister for the management, conservation, and protection of fish resources. These powers include discretion to:

- issue licenses or leases for fisheries or fishing;
- allocate harvests among user groups; and
- protect fish habitat and prevent pollution.

While the regulation of commercial fishing is the most visible of DFO regulatory programs, the *Act* also applies to tidal and recreational fishing, freshwater fisheries, and Aboriginal fisheries.

Three sections of the *Fisheries Act* form the basis for fisheries management in Canada:

- Section 7 provides the Minister with the absolute discretion to issue licenses and leases, wherever the exclusive right of fishing does not already exist by law;
- Section 9 provides the power to cancel or suspend licenses and leases for cause; and
- Section 43 provides regulation-making power by the Governor General in Council for the conservation and protection of fish and the proper management and control of fisheries. This section allows DFO to include mitigation measures related to bycatch of seabirds in fishing licenses.

The *Foreign Vessel Fishing Regulations*, that were promulgated under the *Fisheries Act*, also contain the detailed management provisions governing foreign fishing, including close times, size limits, incidental catch limits, mesh size, closed areas and seasons.

1.4.4 Department of the Environment Act

The *Department of the Environment Act* establishes the Minister of Environment's responsibilities for all matters relating to the preservation and enhancement of the quality of the natural environment, including water, air and soil quality; renewable resources, including migratory birds and other non-domestic flora and fauna; water; and meteorology, among other responsibilities.

1.4.5 Migratory Birds Convention Act

Most migrating birds found in Canada, including seabirds, are protected under the *Migratory Birds Convention Act* (MBCA) of 1917. The *Act* fulfilled the terms of the Migratory Birds Convention of 1916 between Canada and the United States. The Canadian government has the authority to pass and enforce regulations to protect those species of migratory birds which are included in the Convention. Similar legislation in the United States protects species found in that country.

In Canada, the MBCA is administered by the Canadian Wildlife Service. Enforcement of the *Act* and its *Regulations* is the responsibility of the Wildlife Enforcement Directorate of Environment Canada in cooperation with the Royal Canadian Mounted Police and provincial or territorial law enforcement authorities. The *Migratory Birds Regulations* prohibit the incidental take of birds through fishing, among other activities (s. 6).

1.4.6 Bill C-15: An Act to Amend the Migratory Bird Convention Act, 1994 and the Canadian Environmental Protection Act, 1999

In June 2005, Bill C-15 came into force. It amends the *Migratory Birds Convention Act*, 1994 and the *Canadian Environmental Protection Act*, 1999 to more effectively protect migratory birds and the marine environment from the negative effects caused by the discharge of harmful substances, such as oil, into marine waters. The enactment of Bill C-15 also extends enforcement and judicial powers of the MBCA to the EEZ of Canada and refines the tools required to enforce and prosecute violations that occur in this zone.

Bill C-15 clarifies the purpose of the MBCA by referring to both the protection and conservation of migratory birds explicitly as individuals and as populations. The amendments also provide authorities to the Environment Minister to define the conditions and circumstances under which migratory birds may be killed, captured, injured, taken or disturbed with additional similar provisions for nests. These amendments serve to correct technical problems with respect to the issuance of capture or kill permits, and all matters of direct relevance to the issues of birds oiled at sea. They also provide also the legal authority to allow a controlled amount of incidental take of migratory birds or their nests.

1.4.7 Canada Wildlife Act

The *Canada Wildlife Act* was passed in 1973, giving the Canadian Wildlife Service the mandate for the creation, management and protection of wildlife areas; for wildlife research activities; and for the conservation or interpretation of wildlife. The *Act* expanded the species scope of CWS beyond migratory birds and allowed for the designation of protected areas with more stringent regulatory authority than was possible for migratory birds in Migratory Bird Sanctuaries under the MBCA. The *Act* was amended in 1994 to allow for the establishment of protected marine areas in Canadian waters.

1.4.8 Species at Risk Act

The *Species at Risk Act* was created to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened. The *Act* protects species at risk, their residence and their critical habitats. In the marine environment, the *Act* prohibits the taking of individual animals of species at risk (whether fish, birds or other species), as well as their residences and critical habitat, but also does provide for permits related to the incidental take of species at risk.

1.5 International Commitments

The Government of Canada recognizes that sustainability is an international as well as a national challenge.

Canada has made a number of international commitments related to the principles of sustainable development and others more specifically related to the management of the shared ocean resources, including species at conservation risk. Canada has made further international commitments related to the specific management of migratory bird species, including seabirds, which frequently migrate across international boundaries and, as a shared natural asset in their own right, need careful stewardship and management.

Canada has ratified and implemented the following international agreements that are, *inter alia*, key elements for reducing the incidental catch of seabirds:

- 1982 United Nations Convention on the Law of the Sea;
- 1995 United Nations Fish Stocks Agreement;
- FAO Code of Conduct for Responsible Fisheries;
- Convention on the Protection of Migratory Birds in Canada and the United States; and
- Convention on Biological Diversity.

1.5.1 United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea is the comprehensive regime of law and order covering the world's oceans and seas. Within UNCLOS are rules governing all uses of the oceans and their resources. It enshrines the notion that all challenges related to ocean space are closely interrelated and need to be addressed as a whole. Canada ratified UNCLOS in November 2003.

The Convention establishes the requirements for signatories to conserve and manage targeted and associated species within EEZ waters and to cooperate with other States in the conservation and management of living resources in the areas of the high seas. Canada encourages broader participation in this Convention.

1.5.2 United Nations Fish Stocks Agreement

The United Nations Fish Stocks Agreement is an implementing agreement for provisions of UNCLOS regarding the conservation and management of straddling fish stocks and highly migratory fish stocks. Canada ratified UNFSA in August 1999 and is a strong supporter of the Agreement. Canada encourages its broader ratification and implementation.

UNFSA carries an obligation to apply the precautionary approach and ecosystem-based management when managing fisheries on the high seas and in waters under the jurisdiction of coastal States. It also obliges States to minimize pollution, waste, and discards of fish, and to exercise effective control over their fishing vessels on the high seas.

One of the most innovative aspects of UNFSA is the right of States to board and inspect vessels of other State parties in order to verify compliance with internationally agreed fishing rules of regional fisheries management organizations (RFMOs). Finally, UNFSA provides a compulsory and binding dispute settlement mechanism to resolve conflicts in a peaceful manner.

1.5.3 Regional Fisheries Management Organizations and Other Bodies

Canada participates in several RFMOs and other regional fisheries bodies in various capacities. The following bodies are currently the most relevant for the purposes of this NPOA-Seabirds.

International Commission for the Conservation of Atlantic Tunas

Canada is a member of International Commission for the Conservation of Atlantic Tunas which is an RFMO responsible for the conservation and management of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. As part of its mandate, ICCAT coordinates research, including stock assessment, develops scientific-based management advice, and provides a mechanism for Contracting Parties to agree on management measures. In late February 2007, an intercessional meeting of ICCAT's Sub-Committee on Ecosystems conducted an assessment of the mortality of seabirds in ICCAT fisheries.

Northwest Atlantic Fisheries Organization

Given that seabirds commonly cross international boundaries, cooperation regionally will be essential to managing many issues related to incidental catch. As a coastal state, Canada actively participates in the Northwest Atlantic Fisheries Organization. However, as the majority of fishing activity in this organization is primarily conducted by trawl fisheries, bycatch of seabirds in longline fisheries is not seen as posing a problem in the NAFO Regulatory Area.

International Pacific Halibut Commission

Established in 1923 by a Convention between the governments of Canada and the United States of America, the International Pacific Halibut Commission has a mandate to research and manage stocks of Pacific halibut (*Hippoglossus stenolepis*) within the Convention waters of both countries. The IPHC consists of three government-appointed commissioners for each country. The IPHC has been instrumental in conducting research on the incidental capture of seabirds and in applying mitigation measures in this fishery.

1.5.4 FAO Code of Conduct for Responsible Fisheries

The FAO Code of Conduct for Responsible Fisheries is based on the principle that all States and users of fishery resources have an obligation to act responsibly so as to ensure the effective conservation and management of aquatic resources and ecosystems. The IPOA-Seabirds expands upon the Code in its specific application to seabirds.

1.5.5 Convention on the Protection of Migratory Birds in Canada and the United States

In the early part of the 20th century, many species of migratory birds were at risk of extinction. Seeking to protect and provide for the preservation of migratory birds that traverse Canada and the United States, and recognizing that the conservation of these birds is a joint responsibility of the two countries, the Convention was adopted in 1916.

The Convention creates a uniform system of protection by establishing a Canada-United States closed season on the hunting of migratory game birds such as ducks and geese. Hunting of non-game migratory species is effectively banned throughout the year. A protocol amending and supplementing this early Convention was signed by the two countries in 1995 and came into effect in May 2000.

1.5.6 Convention on Biological Diversity

The Government of Canada, with support from provincial and territorial governments, signed and ratified the United Nations Convention on Biological Diversity in 1992, believing it to be a very important global and national instrument for promoting and guiding efforts to conserve biodiversity and to use biological resources sustainability.

2. CURRENT MITIGATION OF INCIDENTAL CATCH OF SEABIRDS

2.1 Overview

For some time, many fishing countries and multilateral organizations have recognized that existing practices in fisheries management and science were not without their limitations, and that uncertainty needed to be recognized and considered in how fisheries were managed. As a result, work began at the international level on the application of the precautionary approach in fisheries management. Such a risk management approach was incorporated into a series of new international agreements and plans, including the United Nations Fish Stock Agreement and the IPOA-Seabirds.

Canada strongly supports these international instruments and the principles that underline them. Canada's *Oceans Act* encourages "the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment." In 2001, the Government of Canada released a policy paper to provide a common structure for the application of the precautionary approach across all federal government departments.

The precautionary approach is based on sound risk management, which requires one to exercise caution and recognize uncertainty in decision making. This is of particular importance where action or inaction could cause serious and potentially irreversible damage. Risk avoidance is essential where there is great risk and great uncertainty. Such risk and uncertainty exist to varying degrees within fisheries.

For several years, DFO has been proactively engaged in the elaboration and discussion of the precautionary approach and its application to fisheries in Canada. The precautionary approach and elements of it have already been applied in some fisheries. DFO is now implementing a fishery decision framework that incorporates the precautionary approach in more marine fisheries in Canada.

Successful delivery of a fishery harvest strategy that incorporates the precautionary approach will require a number of activities including information gathering, catch reporting, data analysis, consultation and involvement of resources users, and the evaluation and amendment of regulations. Canada undertakes these activities and manages its fisheries through:

- Integrated Fisheries Management Plans;
- Fisheries Monitoring Programs; and
- Pelagic Seabird Monitoring Programs.

All of these measures are applied throughout Canada on a relatively consistent basis. However, the detailed development, application and enforcement of these measures often occur at the regional level within Canada (i.e., Atlantic, Pacific and Arctic areas). Consequently, for the purpose of this NPOA, a general national overview is presented, with specific details and exceptions given in the sections dealing with Atlantic, Pacific and Arctic fisheries with regard to seabirds.

2.2 Integrated Fisheries Management Plans

Integrated Fisheries Management Plans (IFMPs) are developed by DFO to identify goals and measures relating to conservation, management and science for a particular fishery. IFMPs also control licensing and TACs for users and areas.

When establishing an IFMP, DFO consults the fishing industry (representatives and associations), provincial and territorial governments, advisory bodies, as well as other stakeholders and interests.

Some IFMPs already address the issue of incidental bycatch of seabirds, including the 2004-2006 IFMP for Canadian Atlantic Swordfish and Tunas, which makes direct reference to the IPOA-Seabirds.

In 2006, Canada implemented an *Integrated Pacific Commercial Fishery Groundfish Pilot*. The pilot provides a comprehensive framework for the management of more than 50 groundfish species taken by six major fleets, including the longline fishery. All commercial groundfish fisheries now operate under integrated quotas and there is now electronic monitoring, where all bycatch must be accounted for, including seabirds. Though seabird bycatch is not directly assessed, the new approach has established clearer accountabilities and incentives for the reporting of all bycatch, including for seabirds in logbooks. This integrated approach emerged in part out of conservation concerns, as more than 21 species associated with the fishery were under review for listing under the *Species at Risk Act*. To date, results of the pilot suggest that fish bycatch accounting has substantially improved, fish bycatch harvests have been reduced, and conservation targets for stocks of concern have been respected.

Though the pilot focused on the bycatch of aquatic fish and other marine species, Canada will explore the integration of seabirds in the future. As improved seabird data become available, the management approach can be adapted and improved. A key challenge for integrated management is having sufficient data on the population levels and distribution of all species. Consistent with the permitting requirements of its *Species at Risk Act*, Canada will work to establish thresholds for priority seabird species along the Pacific coast that do not jeopardize the survival or recovery of the species as appropriate, including the Short-tailed Albatross (*Phoebastria albatrus*), Black footed Albatross (*P. nigripes*) and the Pink-footed Shearwater (*Puffinus creatopus*). Canada will also enhance mitigation measures where such thresholds are being approached.

DFO also continues to identify and assess new fishing techniques and technologies that may mitigate the impact of fisheries practices on habitat and other species. In 2000, the British Columbia halibut industry recommended that all harvesters use tori lines in longline fishing. Coloured streamers that flap in the wind to scare birds away from longlines are attached to lines mounted on poles at the stern of the vessel and are connected to a floating buoy. In 2002, this became a mandatory condition of licence in the commercial halibut, sablefish, and rockfish longline fisheries in Canada.

2.3 Fisheries Monitoring Programs

Canada has various programs in place for monitoring and reporting catch and landing information. Such third-party data are collected through dockside monitoring, at-sea observer coverage, electronic vessel monitoring systems and hail requirements. The only relevant programs for seabirds are at-sea observers and electronic monitoring.

At-sea observers provide independent data on the fishing activities of fishing vessels. By being on board, these observers can collect information on fishing efforts, catches and discards at sea. Such information could not be otherwise collected and presents a more accurate picture of the impact of fishing efforts on stocks and habitat, including the impact on seabirds. The cost of the at-sea observer program is shared between DFO (1/3) and industry (2/3).

Having observers on board also serves to raise awareness about conservation issues and protection measures, including identification and protection of vulnerable bycatch, and may also serve as a general deterrent. These observers are not DFO fishery officers, however, and cannot enforce regulations or laws, although they may be called on later to testify in court.

Coverage for at-sea observers varies depending on the fishery and fishing area. In the past, when foreign vessels fished in Canadian fisheries waters, observers provided 100 per cent coverage of international vessels. This coverage provided a good indication of interactions with seabirds at that time and can be

assessed against current trends.

In Canada's Atlantic fisheries waters, observer coverage of domestic pelagic and demersal longline fleets can range between five and 10 per cent. These observers have been collecting information on seabird mortality since the mid-1980s. Seabirds have been recorded in the Scotia Fundy observer program since 1980, with enhanced identification since 1998. Seabirds have been identified and recorded in the Newfoundland area since 1989 where manuals were enhanced in 2000. In addition, training courses have been given to observers by DFO and CWS in recent years to improve seabird data collection

As for the Pacific, between 2002 and 2006, fisheries observers monitored about 20 per cent of longline fishing trips in the province of British Columbia, collecting data on seabird catches. In 2006, a new electronic monitoring system was implemented. This program utilizes logbooks that are later audited using at-sea camera footage. In the pilot program, both at-sea observers and electronic monitoring were used. When compared, the catch estimates were within two per cent.

2.4 Pelagic Seabird Monitoring Program

In 2005, Canada developed and began implementing the Pelagic Seabird Monitoring Program in Atlantic Canada, in part to address the requirements of the *Migratory Birds Convention Act*. While data on seabirds were collected in Atlantic Canada between 1966 and 1992, there has been no systematic monitoring of birds at sea done since the mid-1980s. On the Pacific coast, pelagic seabird monitoring started in the early 1980s, but systematic surveys did not begin until 1996. The primary objective of the two programs is to map the relative abundance and distribution of pelagic seabirds on Canada's Atlantic and Pacific coasts using a sampling strategy that is based on seasonal survey routes, as well as opportunistic sampling as appropriate.

Long-term objectives for the program include:

- Identifying high risk areas where there is considerable overlap between high bird densities and marine traffic;
- Identifying critical foraging, moulting and roosting areas, as well as the timing and location of major migrations;
- Identifying colony-specific foraging areas;
- Identifying important marine areas for breeding species during the non-breeding season;
- Identifying important areas for species and populations at risk;
- Identifying links between birds and their physical and biological marine habitat;
- Using these links to predict critical marine habitat; and
- Monitoring trends in abundance and distribution of marine birds.

2.5 Canadian Overview and Priorities for the NPOA-Seabirds

In general, the Atlantic longline fishery is the largest in Canada, representing roughly 90 per cent of Canada's longline effort, and includes both pelagic and demersal fisheries. The Pacific longline fishery is primarily a demersal fishery, and represents nearly 10 per cent of Canada's longline effort. The Arctic longline fishery is mixed and relatively small, with little or no effort in some years.

In 2003, Canada developed a technical report entitled *Status Report and Future Directions Towards the Development of a National Plan of Action for the Reduction of Incidental Catch of Seabirds in Domestic and Foreign Longline Fisheries in Canadian Waters*. The report was a joint effort of DFO and the Canadian Wildlife Service and outlined mitigation efforts to reduce the incidental take of seabirds. The report provided the basis for this NPOA-Seabirds by assessing the impacts of bycatch on seabirds within the Canadian longline fishery, some of which has been summarized and updated in Annex 1. With respect to seabirds, effort is measured in relation to the number of hooks deployed each year.

Based on the limited data available to the 2003 assessment, the report indicated that the number of seabirds caught in the Atlantic and Arctic coast longline fisheries was low, but it called for ongoing

monitoring of incidental capture. On the Pacific coast, data suggested that overall bycatch rates are low though recent modelling of black-footed albatross bycatch mortality has been significant enough to warrant mitigation. Mitigation efforts were introduced through voluntary measures in 2002 and new regulations the following year.

Canada will continue to examine levels of incidental catch mortality in longline fisheries throughout the country.

2.5.1 The Canadian Atlantic Longline Fishery

Based on information collected by observers and compared to landing data, it is estimated that since the 1980s about 75 million individual fishing hooks have been deployed annually in the demersal and pelagic longline fisheries of Atlantic Canada. This estimate does not include the Gulf of St. Lawrence where seabird bycatch has not previously been recorded by observers.

The fisheries have changed greatly over the years thereby likely affecting the incidental capture of seabirds over time. There are no recorded scientific data on the effect of the historical longline fishery on seabirds, especially prior to the 1992 groundfish moratorium. The tuna, swordfish and the Atlantic halibut fisheries have been exploited over the entire time period, whereas fishing for Greenland halibut off northern Labrador has been reduced since the mid-1980s. Table 1 shows directed species in the longline fisheries in Atlantic Canada.

Table 1: Directed Longline Fishery Species in Atlantic Canada

DIRECTED FISHERY	SPECIES NAME	PELAGIC OR DEMERSAL
Greenland halibut	<i>Reinhardtius hippoglossoides</i>	Demersal
Atlantic cod	<i>Gadus morhua</i>	Demersal
White hake	<i>Urophycis tenuis</i>	Demersal
Atlantic halibut	<i>Hippoglossus hippoglossus</i>	Demersal
Skate	<i>Raja spp.</i>	Demersal
Yellowfin tuna	<i>Thunnus albacares</i>	Pelagic
Bigeye tuna	<i>Thunnus obesus</i>	Pelagic
Bluefin tuna	<i>Thunnus thynnus</i>	Pelagic
Swordfish	<i>Xiphias gladius</i>	Pelagic
Porbeagle shark	<i>Lamna nasus</i>	Pelagic

2.5.2 Canadian Pacific Longline Fishery

Demersal longlines are deployed in Canada's Pacific fisheries waters with most effort directed at Pacific halibut (five to eight million individual hooks set annually), rockfish (at least 500,000 hooks), sablefish or black cod (500,000 hooks) and spiny dogfish. In 1998, there were about 570 vessels licensed to use longline gear off the west coast of British Columbia. The International Pacific Halibut Commission conducts research and stock assessments of halibut. Catch quotas for halibut are set by the IPHC, but DFO is responsible for regulating the fishery, enforcing quotas, logbook entry and bycatch monitoring.

The rockfish fishery occurs year-round, although the highest effort occurs from June to August. There are approximately 160 licensed vessels which average 4,000 sets annually. Onboard observer coverage was almost 20 per cent in 2001 in the commercial fishery.

The sablefish longline fishery occurs year round, with up to 20 vessels participating. In 1998, 12 vessels fished about 629 sets. Longline gear, as well as trap gear, is used to harvest sablefish. Fishing for sablefish occurs along the continental shelf break, with most effort since the early 1990s focused on the shallow seamounts, though this has since been much reduced.

Table 2 shows the species of fish that are targeted by demersal longlining off the Pacific coast of Canada; there are no pelagic longline fisheries in these waters.

Table 2: Directed Longline Fishery Species in Pacific Canada

DIRECTED FISHERY	SPECIES NAME	PELAGIC OR DEMERSAL
Pacific halibut	<i>Hippoglossus stenolepis</i>	Demersal
Spiny dogfish	<i>Squalus acanthias</i>	Demersal
Rockfish	<i>Sebastes spp.</i>	Demersal
Sablefish	<i>Anoplopoma fimbria</i>	Demersal

2.5.3 Canadian Arctic Longline Fishery

Effort with longlines in the Canadian Arctic Ocean is very low compared to other areas. There is a limited inshore Greenland halibut fishery in winter through the land-fast sea ice in Cumberland Sound, but there have been no reports in fishers' logbooks or any anecdotal evidence of seabirds being captured while the baited lines are sitting out on the ice, prior to being set.

Longline vessels do not currently operate in the offshore Greenland halibut fishery in Baffin Bay, but they have been used in the past and may again be used in the future. There is a low level of effort by longline vessels in the Greenland halibut fishery in the Davis Strait and observer coverage has been limited to one or two trips a year. At-sea observers onboard vessels operating in these fisheries are from companies located in southern Canada and data are included in the analysis for the Canadian Atlantic longline fishery. As such, a separate assessment for the relatively small Arctic fisheries has not been conducted.

3. ACTIONS

The purpose of this section of the NPOA-Seabirds is to identify existing gaps and propose remedial steps that can be implemented to reduce the incidental catch of seabirds in longline fisheries. This includes implementation of an ecosystem approach and the precautionary approach.

3.1 Enhance Coordination of Canada's Approach

3.1.1 Objective

To enhance cooperation among government agencies responsible for seabirds and marine fisheries management in Canada, as well as with the longline fishing industry, in order to ensure that efficient, effective and economically viable measures are taken to reduce the incidental mortality of seabirds.

3.1.2 Means

The management of migratory birds is the responsibility of Environment Canada through the Canadian Wildlife Service (CWS), while responsibility for fisheries and oceans management rests with DFO. The successful implementation of programs to reduce bycatch will ultimately rest with the Canadian longline industry. To ensure that Canada is able to address strategic aspects of its NPOA-Seabirds, current cooperative practices and processes will be enhanced.

The National Seabird Bycatch Working Group was first established to oversee the preparation of the 2003 *Status Report and Future Directions Towards the Development of a National Plan of Action for the Reduction of Incidental Catch of Seabirds in Domestic and Foreign Longline Fisheries in Canadian Waters*. Drawing on staff from DFO and CWS, this group was effective in developing the initial assessment, improving overall coordination efforts of government agencies and industry, and sharing information about the incidental mortality of seabirds. The Working Group has overseen the preparation of the NPOA-Seabirds and will oversee its implementation.

To accomplish this task, the working group will continue to work with industry and non-governmental organizations as appropriate. Given the need to improve data and information sharing regarding seabird bycatch, the National Seabird Bycatch Working Group can facilitate the development of agreements to allow sharing of data among federal agencies, recognizing the potentially sensitive nature of this information to the competitiveness of fishers within the industry.

3.2 Adoption of an Ecosystem Approach and the Precautionary Approach as Key Elements of Fisheries Management Renewal

3.2.1 Objective

To incorporate management tools that reflects the modern conservation objectives of DFO, in particular, through the delivery of Fisheries Management Renewal and the adoption of an ecosystem approach and the precautionary approach to the management of Canada's fisheries.

3.2.2 Means

Over the last several years, DFO has engaged resource users, Aboriginal groups, provinces and territories, and others with an interest in the fisheries resource in extensive policy and program reviews to modernize the way fisheries are managed. The results of these reviews have been consolidated into Fisheries Management Renewal (FMR) – a package of program renewal undertakings that promote predictability, stability and transparency, and a strong and healthy fisheries resource. The FMR's overarching goal is to

develop a new fisheries management governance model that will enable DFO and resource users to meet conservation objectives, and that will enable resource users to respond to the economic forces that affect their industries.

Adopting an ecosystem approach and the precautionary approach to the management of fisheries is fundamental to achieving the conservation objectives envisioned by FMR. Adopting an ecosystem approach to fisheries management involves better understanding and managing the cumulative impacts of fishing. A comprehensive ecosystem-based approach would involve taking account of, among other things:

- all the interactions the target fish stock has with predators, competitors and prey species;
- the effects of weather and climate (including climate change);
- the interactions between fish and habitat; and
- the effects of fishing on species and habitat.

DFO is developing the necessary building blocks to take an ecosystem approach in fisheries management. The emerging approach includes data collection and ecosystem assessment, setting clear ecosystem and management objectives and the development of decision models. It will be supported by policies on forage species, bycatch, and sensitive benthic areas, emerging fisheries and others and delivered through Integrated Fisheries Management Plans.

Adopting the precautionary approach to fisheries management involves setting biologically-based reference points and establishing pre-agreed risk-based actions to be taken at those reference points well in advance of a fishery in order to avoid the stock being reduced to a state of serious harm. For each stock in question, these systems are established in consultation with stakeholders and other interests.

As an example of the progress being made in applying the precautionary approach to fisheries, reference points have been identified for at least 17 fisheries, and these are used to guide management actions. Reference points are used in the management of Berkeley Sound sockeye salmon on the west coast and Gulf herring and harp seals on the east coast.

IFMPs are the fundamental tool for identifying goals relating to conservation, management, science, as well as resource management protection and conservation measures for a particular fishery. IFMPs will continue to evolve along with Canada's approach to managing fisheries.

3.3 Review and Enhance Observer Programs

3.3.1 Objective

To conduct periodic reviews and assessments of the effectiveness of Canada's observer program with respect to the monitoring of seabird bycatch and, in particular, reviewing and developing means to enhance the accuracy of data collected through existing programs.

3.3.2 Means

Canada's observer program targets a broad variety of bycatch species, including seabirds. Efforts to integrate seabird monitoring more strongly into the observer program will be considered in a manner that is commensurate with level of bycatch and with risk to seabird species. These efforts can be undertaken by the National Seabird Bycatch Working Group.

Other factors to be considered in the review of the observer program are:

- Level and frequency of training of both new and existing observers, as part of efforts to maintain and enhance information about seabird bycatch and adapt the program in a timely way as Canada's understanding of the issue grows; and
- Program data standards, including ways of tracking details about the time of day, time of year and the geospatial location of seabird bycatch, both through the observer program and through other sources (e.g., fishing logs and vessel-reported catch systems).

Enhanced monitoring of both bycatch and seabird populations where there are conservation concerns will help to inform integrated management and allow for targeted mitigation. For example the spatial and temporal specific analysis of the Pacific longline fisheries data from 2000-2002 identified a high degree of overlap between the licensed rockfish fishery and Black-footed Albatross. The data suggested that mitigation to reduce bycatch and research to quantify the effectiveness of such measures should be focused in specific areas at specific times (i.e., such as along the continental shelf between Cape St. James and Cape Scott (British Columbia) during the summer months from June to August).

3.4 Promote Mitigation Measures to Reduce Seabird Bycatch in Longline Fisheries

3.4.1 Objective

To address seabird bycatch through the implementation of mitigating measures where information indicates unacceptable levels of incidental take of seabirds in longline fisheries.

3.4.2 Means

Using the best information available and in a precautionary context, actions will be targeted to mitigate seabird bycatch in all Canadian longline fisheries. Outreach programs will further inform fishers of the issue and some of the simple and cost effective ways that they may voluntarily reduce their impact on seabird populations. Included in this list would be the use of tori lines, and mechanisms to remove bait from the surface more quickly such as using thawed bait and weighted hooks.

In fisheries where significant numbers of birds are affected, DFO and CWS will explore the use of targeted quota systems that may be implemented in order to limit the number of birds taken in any given year by specific fisheries.

Environment Canada has begun the process of developing policy and regulations to manage incidental take of migratory birds under the revised *Migratory Birds Convention Act* to ensure broad consistency across industries, including the forestry, mining, oil and gas, agricultural and fisheries sectors. For the fishing industry, it is intended that the regulations of the *Act* would be harmonized wherever possible with the policies and programs of DFO to ensure reduced and sustainable incidental capture. New approaches may include fishery permit conditions that support the conservation of migratory birds.

Where mitigation is deemed necessary and implemented, research and regular assessment will be employed to ensure that the most effective methods are put in use and that they produce desired results.

3.5 Improve Knowledge of Seabird Distributions in Canadian Waters

3.5.1 Objective

To increase the data available on the offshore distribution and abundance of marine seabirds in order to identify and minimize the impact of human activities on birds at sea, including the impact of the Canadian longline fishery.

3.5.2 Means

Although there is relatively good information on the seasonal spatial distribution of seabirds along Canada's Pacific coast, abundance data are far more difficult to quantify, and are thus limited. Data on the abundance of marine birds off Canada's coastlines are required in order to accurately assess the impacts of human activities on all seabirds. Many of these species do not breed within Canada, though they are known to

be frequent visitors to Canadian waters. For resident species, there is almost a complete absence of colony-specific information on marine areas used during the nesting season, or where the birds disperse during the non-breeding season.

Data on colony-specific at-sea distributions, as well as better knowledge about the abundance of non-breeding visitors, will provide critical information to assist with integrated management of the ocean environment. These will also help to identify areas where birds are at the highest risks from a range of human activities, including longlining.

Improved monitoring will assist in developing a better picture of the extent of occurrence of seabird species known to be at risk either globally or in Canadian waters, and help target mitigation efforts.

Canada will work towards increasing its capacity to conduct at-sea inventories of seabirds. Staff from various government departments and agencies that frequent Canadian marine waters (e.g., Canadian Coast Guard, Department of National Defence), interested fishers, Aboriginal groups and academics might be asked to gather and submit systematically collected observational data on seabirds at sea.

Globally-listed species known to occur (or to have occurred) in Atlantic Canada's waters include Black-footed Albatross (*Phoebastria nigripes*), Black-browed Albatross (*Thalassarche melanophris*), Black-capped Petrel (*Pterodroma hasitata*), Fea's Petrel (*P. feae*), and Sooty Shearwater (*Puffinus griseus*). The globally-listed species that occur or have occurred off Canada's Pacific coast are identified in Annex 1 of this document. Once a more complete inventory is in place, and monitoring priorities established, identification sheets can be developed for each coast, and distributed as appropriate (e.g., to fisheries observers, fishing crews, officers and crew of federal ships, and so on).

Additionally, Canada will work to develop (geospatial, seasonal, and temporal) avoidance strategies where appropriate. Canada will also assess the risk and impacts of bycatch and explore the most effective mitigation for species as required. Further, Canada will build on other structures, such as the Pelagic Seabird Monitoring Program, to improve its understanding of the distribution of seabird species in Canadian waters. Opportunistic monitoring will be an important component to the long-term efforts, and Canada will work to develop cooperative relationships wherever possible, to enhance its capacity to collect seabird observational data.

The increased understanding of the spatial/temporal distribution and abundance of seabirds will enhance integrated approaches to the management of fisheries and will aid in the conservation of seabird populations.

3.6 Enhance Outreach and Education Efforts in Canada

3.6.1 Objective

To inform Canadians, especially fishers, as to why Canada has developed an NPOA-Seabirds, and to raise awareness of the importance of taking action to reduce seabird bycatch and mortality.

3.6.2 Means

Canada's 2003 assessment and the development of Canada's NPOA-Seabirds, has highlighted the need to increase understanding about how seabird bycatch occurs and the importance of reducing bycatch.

Many individuals continue to believe that the incidental capture of seabirds only occurs when baited hooks are at the surface; however, this is not the case. While most species are limited to grabbing the bait at or as far below the surface as they can reach with their necks (e.g., albatrosses and Northern Fulmars (*Fulmarus glacialis*)), some species (e.g., Sooty Shearwaters) may dive as deep as 60 meters

below the surface to grasp the bait. Although tori lines on their own are effective and important deterrents to seabird bycatch, the use of weighted (rapidly sinking) demersal longlines in concert with the tori lines, is an effective way to reduce or eliminate bycatch.

Given the perception that bycatch in any single fishery is a rare and inconsequential event, it can be extremely difficult to convince fishers that even low levels of incidental capture can have significant, negative impacts on overall populations. An example is the Black-footed Albatross. This species is known for its habit of taking extraordinarily long foraging trips to provide for its single chick (i.e., from its breeding colonies in Hawaii north to the Aleutians or to the west coast of North America). It is also a species that is known for being attracted to fishing vessels. Typical of many seabird species, Black-footed Albatrosses have delayed sexual maturity such that first breeding may be at age eight or later, and they raise only one chick each year. Even when bycatch reducing methods are adopted by fishers in one or more of the species range states, Black-footed Albatrosses through their ocean-basin wanderings, will still find and attempt to scavenge from fishing vessels in other jurisdictions where there may be no mitigation rules or other forms of bycatch.

Canada will work with stakeholders and other interests to design, develop and implement seabird bycatch programs to provide information on Canada's NPOA. Canada will also raise awareness among government staff, fishers, fishing industry associations and other groups about the causes of bycatch, the need to reduce seabird bycatch in longline fisheries, and the importance of using appropriate mitigation measures.

Outreach and education programs may include materials and guidelines that will be disseminated as appropriate through workshops, videos, handbooks, brochures, and posters. Award programs, like Canada's *National Awards for Responsible Fishing* and the *Roméo Leblanc Medal For Responsible Fishing*, may also be used to promote awareness of seabird bycatch in the longline fishery. Potential outcomes of this program could include improved support for the increased monitoring of seabirds, further adoption of mitigation measures where needed and tools to improve the identification of seabirds, especially for priority species.

3.7 Conduct a Reassessment of Incidental Take at the National Level

3.7.1 Objective

To conduct a reassessment of the incidental bycatch of seabirds in the Canadian longline fishery based on new data and the implementation of key actions in Canada's NPOA, including specific risk assessments to populations known to be threatened.

3.7.2 Means

Canada plans to complete a reassessment of bycatch in the longline fishery by 2010. The reassessment will be based on data collected from Canada's fishery observer programs with input from commercial fishers.

To help inform the assessment, Canada will examine the following:

- Comparative rates of bycatch in fisheries in other States as set out in their national plans of action; and
- Conducting research on how to improve incidental bycatch estimates.

The importance of the longline fishery to Canada ensures that an accurate estimate of the incidental bycatch of seabirds will be undertaken and efforts to improve the current accuracy will be reported.

3.8 National Plan of Action Review

3.8.1 Objective

To report progress on Canada's NPOA-Seabirds as required under the IPOA-Seabirds, and to ensure that the NPOA remains a living document that can be updated as new measures are developed and endorsed.

3.8.2 Means

Under the IPOA-Seabirds, Canada will monitor progress in implementing its NPOA-Seabirds and report to the FAO, every four years, on progress made, lessons learned, and effective strategies implemented. Additionally, Canada will provide updates on the current status of mitigation efforts, new initiatives in research, and any substantial changes to existing management measures and mitigation practices.

Canada will review the NPOA-Seabirds and report on the effectiveness of this plan of action and provide an updated assessment of the incidental catch of seabirds in longline fisheries, as well as any other relevant fisheries, such as the gillnet fishery. Measures for improving the NPOA and current mitigation efforts will also be identified and considered.

4. REGIONAL AND INTERNATIONAL CONSIDERATIONS

4.1 Cooperate within RFMOs to Reduce Seabird Bycatch

4.1.1 Objective

To work within regional fisheries management organizations to develop and enhance seabird bycatch policy and programs, as appropriate.

4.1.2 Means

Canada will continue to cooperate on seabird bycatch issues with the International Pacific Halibut Commission. Through IPHC, Canada will share experience to date on the effectiveness of current mitigation measures in the halibut fishery and share best practices with respect to the incidental take of seabirds. In the Atlantic, Canada will work with its NAFO and ICCAT partners to support targeted research programs related to bycatch, to share data as appropriate on bycatch in the Canadian fishery, and to coordinate any outreach or education programs that are needed to assist with the management of seabird bycatch. These programs might include enhanced international cooperation on best practices to avoid the incidental capture of seabirds.

4.2 Explore Opportunities for Partnerships with Other States

4.2.1 Objective

To explore opportunities to share information and expertise as well as provide guidance or technical assistance, where practical, in conducting assessments of the incidental catch of seabirds or developing *National Plans of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries*.

4.2.2 Means

On a continental level, Environment Canada, including the Canadian Wildlife Service, works with federal agencies in the United States and Mexico through the Trilateral Committee for Wildlife and Ecosystem Conservation and Management to exchange information and develop joint efforts in matters of mutual jurisdiction. CWS will work to foster a harmonized approach to completing and implementing the individual NPOA-Seabirds with trilateral partners where possible.

A broad constituency is involved in bird conservation on a continental level via partnerships of governments and non-governmental organizations through the Trilateral Committee of the North American Bird Conservation Initiative. CWS will support efforts to share information and work on a broader seascape level to implement conservation measures for seabirds through this initiative.

On a hemispheric scale, CWS works with a broad spectrum of conservation partners from across the Americas through the Waterbird Conservation Council. As with the Trilateral Committee and the North American Bird Conservation Initiative, CWS will seek opportunities to share information and expertise to promote seabird conservation through this group.

Other international instruments, such as the Agreement for the Conservation of Albatrosses and Petrels, and the Convention on Migratory Species are involved in efforts to reduce seabird bycatch in fisheries but are currently not relevant in the Canadian context. As a result, Environment Canada has indicated its intention to work with these groups if overlapping objectives are determined but will not become a signatory. For those species that migrate to Europe and Africa, work with the African-Eurasian Waterbird Agreement may become necessary to link Canadian efforts with those across the Atlantic Ocean.

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(Note: All document links were accessed as of February 2007.)

ANNEX 1: SUMMARY AND PARTIAL UPDATE OF THE 2003 ASSESSMENT OF THE INCIDENTAL CAPTURE OF SEABIRDS IN THE CANADIAN LONGLINE FISHERY

1. Introduction

This Annex is based on data presented in an assessment report related to the preparation of Canada's NPOA-Seabirds entitled *Status Report and Future Directions Towards the Development of a National Plan of Action for the Reduction of Incidental Catch of Seabirds in Domestic and Foreign Longline Fisheries in Canadian Waters, 2003*. Only the section outlining the assessment of the longline industry is presented in this Annex.

Canada intends to repeat this assessment for its three coasts by 2010, as outlined in the actions section of this NPOA.

2. Incidental Capture of Seabirds in Canada's Atlantic Longline Fishery

2.1 Gulf of St. Lawrence

For the 976 longline fishery sets observed on Canadian vessels in the Gulf of St. Lawrence in 2001, seabird bycatch consisted of eight kilograms of the unidentified gull and three kilograms of Herring Gull (*Larus argentatus*), or an estimated 0.0036 to 0.0108 birds per thousand hooks (based on 1000 to 3100 hooks per set). Observed fishing effort of the longline fisheries in this region is approximately five to 10 per cent.

2.2 Maritimes Region

The number of seabirds and the corresponding fishing effort (number of sets) on observed vessels in the Scotian Shelf and Bay of Fundy regions are reported in Table 3. The total number of seabirds caught was not estimated due to the low percentage of observer coverage and sporadic nature of the fishing effort. It should be noted that longline fishing effort varies greatly in terms of season, duration of trip, location, number of sets per trip and the number of hooks per set. Due to a requirement for 100 per cent observer coverage of foreign vessels, it can be estimated that the total number of birds caught for the 5,839 sets that were observed on Japanese vessels in Canadian waters between 1986 and 2001 was 394. Most of these were unidentified birds and all the fishing effort occurred between October and December. Out of 848 sets from Faroese vessels and 15 sets from Greenland big vessels with 100 per cent of observer coverage, no seabirds were caught between 1986 and 2001.

Table 3: Observed Fishing Effort (number of sets) and estimated numbers of seabirds caught in the Scotian Shelf and Bay of Fundy waters during longline trips observed 1986-2001 on Canadian and foreign vessels

VESSELS IN CANADIAN WATERS FROM:	CANADA	CANADA	JAPAN	JAPAN	GREENLAND AND FAROES	FAROES	TOTAL
Longline fishery species	Demersal	Pelagic	Demersal	Pelagic	Demersal	Pelagic	
Observed effort (number of sets)	15,762	1,528	1,595	4,244	11	838	23,978
BIRD SPECIES							
Double-crested Cormorant	0	1	0	0	0	0	1
Great black-backed Gull	6	16	0	3	0	0	25
Greater Shearwater	6	37	0	0	0	0	43
Lesser Black-backed Gull	1	0	0	0	0	0	1
Herring Gull	0	15	0	0	0	0	15
Northern Fulmar	53	1	0	0	0	0	54
Northern Gannet	0	0	0	9	0	0	9
Sooty Shearwater	4	0	0	0	0	0	4
Not specified	5	0	0	382	0	0	387
Total	75	70	0	394	0	0	539

*Observer coverage is approximately 100 per cent on foreign vessels and was found to be between five and 53 per cent in the cod/haddock/pollock fishery for Canadian vessels in the Scotia-Fundy region.

**Number of birds has been calculated using estimated bird weights (kg) from Birds of the World.

***Number of hooks used per longline set can vary greatly from one hook to 1500 per set; number of longline sets released per fishing trip may vary from one to 10.

2.3 Newfoundland and Labrador Region

The number of seabirds caught on observed vessels and the corresponding fishing effort (number of sets) in Newfoundland and Labrador Region are reported in Table 4. As the data suggest, the relationship between fishing effort and the number of birds, is highly variable and difficult to predict.

Between 1989 and 2001, between five and 10 per cent of the Canadian vessels had observers on board; during that period, 120 birds were caught in this region. The majority of birds (115) were caught in the Canadian demersal longline fishery, of which 1,044 sets were observed. Out of 59 sets that constituted this pelagic longline fishery, only five birds were caught between 1989 and 1990 (approximately five to 10 per cent observer coverage on Canadian vessels in Newfoundland waters). With 100 per cent observer coverage of foreign vessels in Canadian waters, the picture is more complete. Of the 313 sets fished (mostly for Greenland halibut) by Norwegian vessels, 146 Northern Fulmars were killed. In contrast, Faroese vessels fished 848 longline sets between 1989 and 1992 and only four gulls were observed caught.

Table 4: Observed Fishing Effort (number of sets) and estimated numbers of seabirds caught in Newfoundland waters during longline trips observed 1989-2001 on Canadian and foreign vessels

VESSELS IN FROM:	CANADA	CANADA	FAROES & JAPAN & NORWAY	FAROES	GREENLAND	JAPAN	NORWAY	TOTAL
Fishery species	Demersal	Pelagic	Demersal	Pelagic	Demersal	Pelagic	Pelagic	
Observed effort (number of sets)	1,044	59	21	4,455	67	53	312	6,011
BIRD SPECIES								
Great black-backed Gull	0	0	0	4	0	1	0	5
Herring Gull	8	0	0	0	0	0	0	8
Northern Fulmar	70	0	0	0	0	0	146	216
Sooty Shearwater	19	0	0	0	0	0	0	19
Greater Shearwater	4	5	0	0	0	0	0	9
Not specified	14	0	0	0	0	3	0	17
Total	115	5	0	4	0	4	146	274

*Observer coverage is approximately 100 per cent on foreign vessels and was found to be between five and 10 per cent for Canadian vessels in the Newfoundland region.

**Number of birds has been calculated using estimated bird weights (kg) from Birds of the World.

***Number of hooks released per longline set and number of longline sets per trip can vary greatly.

2.4 General Conclusions about Atlantic Canada

Despite the effort put into monitoring seabird bycatch, much of the recent data have not been analysed. There is still relatively little known about seasonal variability in the numbers and distribution of seabirds off the Atlantic coast (Brown *et al.*, 1975; Lock *et al.*, 1994; Huettmann and Lock, 1997; Huettmann and Diamond, 2000; 2001). Northern Fulmars, Herring Gulls and Great Black-backed Gulls (*Larus marinus*), Sooty Shearwaters (*Puffinus griseus*), Greater Shearwaters (*Puffinus gravis*) and Northern Gannets (*Morvus bassanus*) are the species most often caught in longline fisheries. With the exception of Herring Gulls, breeding populations of some of these species in the Canadian Arctic and Europe have expanded and are now stabilizing (Hatch and Nettleship, 1998); within Newfoundland and Labrador, small breeding populations have increased and are probably now stable (Stenhouse and Montevecchi, 1999; CWS unpublished data). Herring Gull populations are declining throughout their Atlantic range, (Chapdelaine and Rail, 1997; Robertson *et al.*, 2001; Boyne and Hudson, 2002) probably due to reductions of food made available through fishing activities and in landfills. Great Black-backed Gull populations have shown a mix of trends, declining in Labrador, stable in Newfoundland, and increasing or stable in parts of the Maritimes (Mawhinney *et al.*, 1999; Boyne and Hudson, 2002; Robertson *et al.*, 2002). Northern gannet populations are increasing at all colonies in North America. There is no information on population trends of shearwaters, though the Small Manx Shearwater (*Puffinus puffinus*) breeding population in southern Newfoundland is known to have declined (Robertson, 2002).

Demersal longline fisheries in Canadian Atlantic waters had an associated observed bycatch rate of 0.016 birds/1,000 hooks over the 14-year period between 1986 and 1999 (Cooper, *et al* 2000). For those years, it was estimated that about 500 birds were killed annually by demersal longliners, although the number has varied greatly from year to year depending on fishing effort. For the 27 demersal sets observed with seabird bycatch, on average 1.3 birds were taken on 3,100 hooks per set. A high majority of the sets contained no seabirds. The longline fishery for Greenland halibut, taking place prior to the 1990s in an area along the shelf edge between Canada and Greenland, had been the primary source of mortality of seabirds by demersal longliners in Canadian Atlantic waters. Observers reported mortality of Northern Fulmars and Great Black-backed Gulls at a rate of about 0.02 birds per thousand hooks in the turbot fishery. Observations on bird bycatch have been kept since 1999 but not yet analysed.

The catch rate for pelagic longline fisheries in the Canadian Atlantic between 1986 and 1999 was estimated at 0.032 birds per 1,000 hooks, double that observed for demersal fisheries (Cooper, *et al*. 2000). Between these years, all of the fishing effort took place along the outer slope of the Scotian shelf and the southwest slope of the Grand Banks. It is estimated that approximately 1,400 birds were killed annually by pelagic longliners. Bird mortality was recorded when fishing was directed at tuna and swordfish but not for the small porbeagle shark fishery. On average, four birds were taken on the 1,700 hooks (per set) from the 55 pelagic sets observed with seabirds between 1986 and 1999. The species recorded were northern gannet, Herring Gull and Great Black-backed Gull. Until the late 1990s, most bird mortalities in this fishery were not classified by the species level but it is assumed that some of the catch may actually have been composed of an unknown number of shearwaters, since Sooty Shearwaters and Greater Shearwaters had been captured in gillnets in the same and adjacent areas. One double-crested cormorant (*Phalacrocorax auritus*) was caught in August, 1998 in NAFO Division 5ZM (Georges Bank) during a swordfish (pelagic) longline trip. None of the affected species is considered to be at conservation risk.

Four trips of pelagic longline vessels targeting tuna and swordfish were observed on the Scotian shelf between June and December, 2000 (Smith, 2000). In addition, 12 interviews were held using a questionnaire with longline skippers and crew. Only one bird, a Greater Shearwater, was reported caught. The catch per thousand hooks overall for four trips was 0.03. Typical of most bycatch events, the birds ingested the bait during the setting of the gear. The number of seabirds taken by this fishery appears to be very low, possibly because the gear is most often set and hauled in low light conditions and baits are heavy enough to sink quickly. Results obtained from questionnaires suggested that there is not a substantial seabird bycatch problem in this fishery.

It should be stressed that the observations above are based on relatively low observation rates (three to 10 per cent of the sets observed), and inadequate identification of species in historical data. Although these data indicate low catch rates, better data on catch rates and species identification are required.

3. Incidental Capture of Seabirds in Canada's Pacific Longline Fishery

The International Pacific Halibut Commission's standardized stock assessment survey reported one Black-footed Albatross from 80,000 hooks hauled in 1998. No birds were caught when 100,000 hooks were hauled in 1999 and all survey vessels used a seabird deterrent device. A summary of IPHC port interview data indicated that 24 birds were caught in 1998 (out of 4.6 million hooks hauled) and 23 birds were caught in 1999 out of 8.3 million hooks hauled (Gilroy *et al.*, 2000). Albatrosses were the most commonly reported species although not all birds caught were identified.

Table 5: Number of seabirds reported caught in the Pacific region for commercial longline trips observed between 1999 and 2004 on Canadian vessels

DIRECTED LONGLINE FISHERY SPECIES		HALIBUT	DOGFISH AND LINGCOD	ROCKFISH NEARSHORE	ROCKFISH SEAMOUNT CHARTER
Bird Species	Year				
Black-footed Albatross	1999	1		0	3
	2000	1		0	4
	2001	2		0	no fishery
	2002	1		9	no fishery
	2003	5		4	no fishery
	2004	1		0	no fishery
Northern Fulmar	2002	1		0	no fishery
Herring Gull	1999	0		0	0
	2001	0		0	no fishery
	2002	0		0	no fishery
	2003	4		0	no fishery
	2004	0		0	no fishery
Glaucous-winged Gull	2001	1		0	no fishery
	2004	4	4	4	no fishery
Gulls	2001		0	1	no fishery
	2002		1	1	no fishery
	2003		1	1	no fishery
Pigeon	2001	1		0	no fishery
Total		22	6	20	7
Observer Coverage (% of hooks hauled)	1999	1.6		0.2	42.3
	2000	2.5		0.7	100
	2001	9.8		1.7	no fishery
	2002	18.6		10.6	no fishery

(Note: for an update of the incidental capture of seabirds in the Canadian Pacific Longline fishery, please see Smith et al., 2005. Based on this report, an average of 7.5 million hooks were hauled in the commercial halibut fishery in Canadian waters from 1999-2002 (range 6.4-8.3 million) in 1999. A total of nine albatrosses were captured. The results of this work have helped to support the adoption of tori lines in this fishery. The IPHC port interviews, 1998-1999, reported 16 albatrosses as bycatch in BC, more than all other IPHC areas combined. The high bycatch rates in BC were partly due to higher interview rates and more accurate reporting results (Gilroy et al., 2000).)

As shown in Table 5, the majority of the seabird species caught in all Pacific longline fisheries between 1999 and 2001 were Black-footed Albatrosses or unidentified albatross species. Observer coverage increased in all fisheries from 1999-2002, with up to 18 per cent coverage in the British Columbia commercial halibut fleet

Uncertainty exists concerning the seasonal variability in the numbers and distribution of seabirds along the Pacific and Atlantic coasts. However, a 20+ year data set of seabird abundance and distribution at-sea within the Pacific Canadian EEZ was used to examine spatio-temporal overlap between the commercial fisheries and the Black-footed Albatrosses (Wiese and Smith, 2003).

The global distribution of the breeding colonies for most of the above species of seabirds is well known (i.e., most field guides accurately present that information). However their at-sea movement is poorly understood because of the prohibitive cost and challenges that monitoring would involve.

All of the species listed above breed outside Canada, and migrate into or through Canadian waters either during their breeding and non-breeding seasons, or both. The constant passage of birds into and out of Canadian waters makes it virtually impossible to come up with a precise estimate of the total or maximum number of birds present. Additionally, because the abundance and distribution of their preferred prey are influenced by a complex interaction of physical, chemical and biological processes, the distribution of seabirds varies to a large degree with prey.

During the summer, many of these species, especially Black-footed Albatross and Short-tailed Albatross, occur not only offshore but on the continental shelf and along the edge of the shelf break. The shelf is roughly the outer boundary of where most rockfish longlining occurs; however, new technology now allows fishing on the deeper, rockier shelf break slope.

3.1 Detailed Modelling Assessment of Black-footed Albatrosses

In early 2003, a detailed modelling assessment of mortality was conducted to estimate the population effects of Pacific longline fisheries on Black-footed Albatrosses. The results showed that though bycatch of this species in Canadian waters was relatively low, it was still considered significant.

Black-footed Albatrosses are the species most commonly reported caught in the demersal longline fisheries in British Columbia. According to BirdLife International, the Black-footed Albatross population has a projected 20 per cent decline over 60 years (three generations). In the modelling assessment, the total annual mortality of Black-footed Albatross from the demersal halibut and rockfish longline fishery in British Columbia was estimated based on fishing and observer effort (2000-2002), and the occurrence of Black-footed Albatross in waters less than 500 metres deep (1982-2001). To assess population effects, a stochastic, density-independent matrix population projection model was used based on published demographic parameters from three main colonies in the northern Hawaiian Islands. The annual estimate of the incidental capture of Black-footed Albatross off the coast of British Columbia was compared with the estimated mortality from the United States and international demersal and pelagic longline fisheries in the North Pacific.

The combined halibut and rockfish annual fishing effort in British Columbia, between 2000 and 2002, ranged between nine and 11 million hooks. Albatross bycatch rates ranged from 0 to 0.0524 birds per thousand hooks observed. Bycatch was highest in those areas along the shelf break, where albatross were found and during the spring and summer. Based on the most spatially and temporally explicit model possible given the available data, it was estimated conservatively that between 67 and 162 Black-footed Albatrosses were killed yearly in the rockfish and halibut demersal longline fishery off the coast of British Columbia, although mortality could be as low as 22 or as high as 253 (Wiese and Smith, 2003). In a study that spanned four years (1999-2002), but did not adjust for variation in the distribution of observer effort (in space or time), Smith and Morgan (2005) estimated between 20 and 178 Black-footed Albatross mortalities per year. Currently, Black-footed Albatross populations on the Hawaiian Islands appear stable with a stochastic intrinsic growth rate of 1.005 (0.990-1.018). Projecting the estimated bycatch mortality inflicted on these birds in Canadian fisheries waters onto the population had minimal effect on survival rates and potential population growth rates. In comparison, modelling the combined effects of eliminating the bycatch mortality estimates produced for the United States (Alaska and Hawaii), Japan and Chinese Taipei, increased juvenile and adult survival rates by 3.9 per cent of its current rates, and predicted a potential population growth rate of 1.04 (1.03 – 1.06). Eliminating the Canadian bycatch of albatrosses would add another 0.1 per cent to the current survival rates.

Effectively, this means that Black-footed Albatross populations in the northern Hawaiian Islands have the potential to grow up to four per cent per year in the absence of bycatch mortality from longline fisheries in Canada, the United States, Japan and Chinese Taipei, though this calculation does not consider the known, but non-quantified bycatch in international high-seas fisheries as well as in other parts of the

Black-footed Albatrosses oceanic range. Mortality estimates and bycatch rates presented for Canada should be considered conservative because of the lack of complete spatial and temporal fishing data, incomplete observer coverage, and limited knowledge of the spatial and temporal abundance of albatross off the coast of British Columbia. Given the current trend in Black-footed Albatross populations, this species should be considered vulnerable to any increases in anthropogenic mortality and stresses the need to reduce bycatch throughout its entire range wherever possible (Wiese and Smith, 2003).

4. Incidental Capture of Seabirds in Canada's Arctic Longline Fishery

Although fishery effort with longlines in the Canadian part of the Arctic Ocean is very low compared to other areas, there is a limited Greenland halibut fishery; which uses both longlines and gill nets.