2011-2015 Integrated Fisheries Management Plan for Atlantic Seals

Cover Page

HARP
(*PAGOPHILUS GROENLANDICUS*)

HOODED
(*CYSTOPHORA CRISTATA*)

GREY
(*HALICHOERUS GRYPUS*)

RINGED
(*PHOCA HISPIDA*)

BEARDED
(*ERIGNATHUS BARBATUS*)

HARBOUR
(*PHOCA VITULINA*)

Foreword

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the Atlantic seal fishery, as well as the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to DFO staff, sealers, legislated co-management boards and other stakeholders. This IFMP provides for more informed stakeholder input into management decisions, and promotes a common understanding of the basic "rules" for the sustainable management of the fisheries resource.

This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be

modified at any time and does not fetter the Minister's discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

Where DFO is responsible for implementing obligations under land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

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Signed: Regional Director, Fisheries Management, Maritimes Region

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Optional *- Signature and title of other approval authority (i.e. authority established under land claims agreement.)*

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3.1 Overview

3.1.1 History

There is evidence that Atlantic seal hunting occurred as far back as the early Dorset culture, 3,000 years ago. Thule Inuit harpooned seals about 1,000 years ago, and in 1534, Jacques Cartier found Labrador Innu hunting seals in the Strait of Belle Isle.

By the end of the 16th century, seals were a crucial part of the European fleets' catch on their annual fishing expeditions to the Magdalen Islands. Basque, Breton and Norman fishers caught seals at the end of the 1600s. Settlers from the North Shore of the St. Lawrence and the northeast coast of Newfoundland began hunting seals commercially in the early 1700s, and offshore hunting began in the late 1700s.

Seal oil was the main reason for the early commercial hunt. By the early 1800s, large quantities were being shipped to Britain to be used as fuel for lamps, as lubricating and cooking oil, in the processing of leather and jute, and as a constituent in soap. By the 1860s, the hunt accounted for about one-third of Newfoundland's exports, and the departure of the sealing fleet became a major event every March for people in St. John's, who gathered on the wharf for the occasion.

In the early 1900s large steel steamships that could break through ice replaced lighter wooden steamers that could often become icebound while following the seal herds, strand sealers waiting for pickup, or have their hulls crushed in the pack ice.

In 1914, a crew of sealers from the hunting vessel *Newfoundland* was left on the ice for two days with little food and light clothing during a fierce snowstorm. 78 men froze to death on the ice, and many of the 55 survivors lost limbs and were crippled for life. In addition to this tragedy, another 175 sealers died doing their job that year. Such stories of danger, hardship and loss abound in eastern Canada's folklore and art.

After WWII, smaller diesel ships and longliners were used in the hunt and landings ranged from 250,000 - 300,000/year. The use of safer, more modern and better-equipped vessels increased the safety factors considerably and large harvesting vessels began to seek the seal herds annually.

Through to the late 20th century, sealing facilitated the spread of permanent settlements on the northeast coast of Newfoundland where previously only a summer cod fishery had taken place.

Quota management was introduced in Canada in 1971 amid concern that the herds were being depleted. Harp seal landings dropped to 120,000-200,000/year in 1972-82. In addition to the quota system, landings were affected by the introduction of the *US Marine Mammal Protection Act* of 1972 which continues to severely restrict marine mammal products to the extent that even legal transshipments are vulnerable to seizure in that country.

In 1983, the European Economic Community banned the importation of whitecoats (unweaned harps) and bluebacks (young hooded). From 1983-1995 an annual average of only 52,000 harp seals was taken, far below the quota.

In December 1987, a government decision prohibited the commercial harvest of whitecoats or bluebacks, and

hunting from large vessels. This decision arose from recommendations by the Royal Commission on Seals and Sealing in Canada, which issued its report and recommendation in 1986.

The harp seals total allowable catch (TAC) was raised to 250,000 in 1996 following the release of the 1994 population estimates and 1995 public Seal Fora were held to discuss the situation.

In 2009, amendments to the Marine Mammal Regulations were made which now require the three-step process, a regulated procedure to ensure a humane kill.

The commercial harvest is now carried out using longliners (vessels 35'-65' in length) or small boats (vessels under 35' in length). Where there is solid ice and seals are close to shore, sealers may harvest on foot or using snowmobiles. The harvest provides important seasonal income and food to residents of small coastal communities where there have been fishery closures and employment opportunities are limited.

Currently, DFO encourages the fullest possible commercial use of seals. Seal products consist of leather, handicrafts, and meat for human and animal consumption as well as seal oil, which is rich in three kinds of Omega-3 fatty acid, widely believed to have numerous health benefits . New product development, as in specialized seal food products and research into the use of harp and grey seal heart valves in human heart surgery, is ongoing, and international trade opportunities, especially with China, are active.

Both the Front and Gulf harvests are pursued by small vessels (less than 35') and longliners (35'-65'). Vessels greater than 65' are not allowed to participate in the harvest except as collector vessels.

The small vessel harvest is conducted fairly close to shore and usually involves a crew of 2-5 sealers depending on vessel size. Vessels generally land daily to offload their catches.

The longliner (vessels 35'-65') fleet operates in both the Gulf and on the Front. These vessels carry larger crews and tend to stay out for a few days at a time.

Approved harvesting methods are restricted to the use of regulated rifles and shotguns, clubs and hakapiks.

Rifles are used most often on the Front where ice floe conditions make it difficult to get close enough to the seals to use a hakapik until after they have been shot.

Hakapiks are used more extensively in the Gulf during years when sealers are readily able to access ice pans and get close to the seals.

3.1.2 Types of Fishery

Six species of seals, harp, hooded, grey, ringed, bearded, and harbour, are found off the Atlantic coast of Canada. Of the six, the northwestern Atlantic harp seal is the most abundant of all seal species in Atlantic Canada, and accounts for almost all the seals harvested commercially, with small numbers of greys and very few hooded making up the balance.

Ringed and bearded seals are more typically found in the Arctic and are taken primarily for subsistence purposes. The Marine Mammal Regulations prohibit harvesting of harbour seals, though small numbers are reported taken for subsistence.

All Canadian species have been hunted by humans for thousands of years, for food, fuel, shelter and clothing, and other products.

Although harp seals have been hunted commercially since the 16th Century, the present day Atlantic coast commercial seal harvest took shape in the late 1980s after the collapse of the large vessel harvest for whitecoats.

Harp seals are distributed in three major populations of this abundant species, of which the northwest Atlantic population off Canada is the largest. The others are the White Sea / Barents Sea population and the Greenland Sea population. A 2004 harp seal population survey found the harp seal population to be stable and healthy at approximately 5.8 million animals, nearly triple what it was in the 1970s. Following a survey in 2008, this number was revised upward to approximately 7.2 million. The population in 2010 is estimated to be between 8.5 and 9 million seals.

In addition to the subsistence harvests of the Canadian Arctic and Greenland, harp seals are harvested commercially in the Gulf of St. Lawrence and off the coast of northeast Newfoundland and southern Labrador (called "The Front"). Harp seals are also known to be taken as incidental catch in a number of fisheries.

Hooded seals are divided into two presumed populations in the north Atlantic, one in the Greenland Sea and one in the northwest Atlantic. Recent genetic analysis concluded that hooded seals do in fact form a single panmictic genetic stock, although they are treated separately for management purposes.

In the northwest Atlantic, hooded seals whelp on the pack ice in Davis Strait, off the northeast coast of Newfoundland (Front) and in the Gulf of St. Lawrence (Gulf). Harvesting has never taken place in Davis Strait, while the Gulf herd is very small and no harvesting of this stock has been allowed since the mid-1960s.

Since 1999, less than 400 hooded seals have been taken annually at the Front and the Greenland harvest appears to be stable at around 8,000 animals.

The total hooded seal herd in the northwest Atlantic is estimated to have increased from 478,000 in 1965, to approximately 600,000 today.

Grey seals form a single population in the northwest Atlantic, but for management considerations they are divided into three groups: the first pups on Sable Island, a second pups along coastal Nova Scotia and a third pups in the Gulf of St. Lawrence.

The total population has increased from less than 30,000 animals in the early 1970s to around 350,000 animals in 2010. Grey seals have been harvested commercially in Canada, but harvests have never exceeded 5,000 animals. In 2010 no animals were harvested commercially.

Ringed seals are numerous and have a circumpolar distribution There are thought to be approximately one million of these seals in the eastern Arctic. Ringed seals inhabit the coastal waters of Labrador, but are also observed on a regular basis along the northwest and northeast coasts of Newfoundland, in the northeast Gulf of St. Lawrence, and occasionally in more southern areas of the Province of NL.

An estimated 1,500 ringed seals are thought to be taken annually for subsistence use, but harvest statistics are incomplete.

Bearded seal inhabit the coastal waters of the northern Gulf of St. Lawrence, along the Labrador coast and northeastern Newfoundland. Population size in Atlantic Canada is not known. Harvest statistics are incomplete, but roughly 50-200 bearded seals are taken annually for subsistence use.

Harbour seal population size is not known, but is thought to be in the order of 20,000-30,000 animals. The seals occur in coastal waters along the Newfoundland and Labrador coast, throughout the Gulf of St. Lawrence and around Nova Scotia. They are abundant in the northeastern United States.

3.1.3 Participants

With volatile and declining markets on the heels of record high prices paid for seal pelts in recent years, the number of commercial licenses issued to sealers averaged 16,000 per year. The majority of these licenses are unused, and are renewed annually by the holders simply to maintain eligibility in anticipation of favourable harvesting conditions and prices in future.

At the request of industry, a freeze on the issuance of new commercial sealing licenses was implemented in 2004, and was extended until such time as professionalization, including the mandatory training and certification of sealers, is established. Temporary sealing permits are issued as required, to respond to the need for crew, but these have a lesser range of permissible activity (which might vary from a Region to a another), based on assisting a commercially licensed sealer.

Groundfish fishery closures have increased the relative importance of sealing as a source of livelihood. Residents of Labrador north of 53°N latitude do not need a license to hunt seals for subsistence purposes.

In addition to the individual commercial fishery licenses, personal use licenses are issued. Since 1995, residents adjacent to sealing areas throughout Newfoundland and Labrador and Quebec have been allowed to harvest up to six seals for their own use. The freeze on issuance of new personal use sealing licenses was implemented in 2004 but was lifted in 2009. Aboriginal peoples and non-Aboriginal coastal residents who reside north of 53°N latitude can continue to harvest seals for subsistence purposes without a license, or as determined by specific treaty rights.

3.1.4 Location of the fishery

Canada's seal management areas are shown in the maps at Appendix 1 (Maps). The distribution of commercially harvested seals (harps, hoods, and greys) are described here.

The northwest Atlantic population of harp seals summers in the Canadian Arctic and Greenland. They begin their southward migration in early fall and by late November, reach the southern Labrador coast. From here, about a third of the mature seals enter the Gulf of St. Lawrence and the rest migrate southwards along the east coast of Newfoundland.

Movement of ice floes and ice conditions often determines the degree of effort in any given area. Approximately 70% of the seal harvest occurs on the Front, an area off the north and east coasts of Newfoundland and southern Labrador.

Although variable ice conditions have been observed historically, there has been a dramatic decline in harp seal-

friendly ice cover in recent years. 2010 saw the lowest ice cover ever observed in the Gulf, and suitable ice occurred much further north than is normal at the Front.

Hooded seals follow a similar migratory pattern as harp seals, though whelping typically occurs further north (including the Davis Strait) and a smaller proportion of the population congregates in the Gulf. Commercial harvesting of hoods is limited, and restricted to the Front due to the small size of the Gulf herd.

Grey seals remain present in Atlantic Canada throughout the year, with seasonal movements occurring within the region.

3.1.5 Fishery characteristics

Management

In 1987, following the report of the *Royal Commission on Seals and Sealing in Canada* (the Malouf report), the Minister of Fisheries and Oceans announced prohibitions on:

- the use of vessels over 65' (19.8 metres) in length for harvesting purposes;
- the commercial harvest of whitecoats harp seals that have not begun to moult (which begins at about about age 10 days of age); and,
- the commercial harvest of bluebacks (hooded seals that have not moulted, which occurs at about 15 to 16 months of age).

In February 1993, the Marine Mammal Regulations were established to replace several sets of regulations. These regulations included the current prohibition on the sale, trade, or barter of whitecoats and bluebacks.

In May 2005, the Independent Veterinarians' Working Group on the Canadian Harp Seal Harvest (IVWG) evaluated the harvesting practices in the harp seal harvest. Their report, *Improving Humane Practice in the Canadian Harp Seal Harvest*, was published in August of 2005.

The IVWG recommended, among other things, that a three-step process of striking, checking, and bleeding be followed. After consultation, the *Marine Mammal Regulations (MMR)* were amended in 2008, to prescribe a clear procedure for ensuring a humane kill.

As the seal provides an array of products, (including oil, fur, and meat), any marketing or product development effort is made with as much consideration as possible being given to the full use of the animal in all aspects of its potential for a marketable product. Central to a market and product development strategy is the maximizing of economic opportunities while maintaining long-term sustainability of the resource.

Technological improvements allow both DFO Conservation and Protection (C&P) and animal welfare observers to observe the harvest in great detail. The geographically widespread harvest and the equally wide variety of conditions makes consistent enforcement highly difficult, but as groups of boats often follow herds of seals, solitary harvesters are uncommon, except when weather and ice conditions facilitate land access. C&P annually develops strategies for an Enforcement Plan that accounts for weather and ice conditions.

Three-step process

The three-step process is a science-based approach developed to ensure that seals are harvested quickly and humanely. The amendments to the *Marine Mammal Regulations* prescribe the process.

Step 1 - Striking: This step refers to the shooting or striking of the seal on the top of the cranium with either an approved firearm or a hakapik (or club) in order to render the animal irreversibly unconscious or dead by crushing both halves of its cranium.

Changes to the regulations prohibit the use of the hakapik or club as the primary harvesting instrument for any seal over one year of age. The hakapik or club has been studied by veterinary experts and is considered to be a humane instrument for harvesting young harp seals (up to at least 1 year of age) because the top of their cranium is very thin and can be easily crushed by one or a few strikes. For harp seals over one year of age, sealers must first shoot the seal with an approved firearm to ensure that the cranium is crushed quickly and therefore minimize suffering.

Step 2 - Checking: The process of "checking" refers to confirming, by palpation, that both the left and right halves of the cranium are crushed, which confirms irreversible unconsciousness or death of the seal. Instead of using the "blinking reflex test" which was used in the past to determine the state of the seals, the amendments require the sealer to immediately (or as soon as possible if a firearm is used) palpate the cranium following striking. Where palpation indicates that the seal's cranium is not crushed, the sealer is required to immediately strike the seal again with a hakapik or club on the top of the cranium until it is crushed.

The amendments also include definitions of the terms "crushed" and "palpate", with respect to checking the cranium of the seal.

Step 3 - Bleeding: The "bleeding" step refers to the severing of the two axillary arteries of the seal located beneath its front flippers. Proper bleeding ensures that the seal is dead. The amended regulations also require sealers to allow a minimum of one minute to pass after bleeding the seal before beginning to skin the seal. The one-minute time requirement was arrived at through consultation with Fisheries and Oceans Canada (DFO) scientists, who advised that the average time for a seal to bleed out is forty-five seconds or less.

Together with licence conditions addressing other related aspects of the three-step process, the proposed amendments clearly articulate the requirements for a humane harvest. They provide the basis for a shared understanding of requirements in support of improved sealing practices and better compliance and enforcement.

The amended regulations, together with licence requirements, also provide greater clarity for others monitoring or observing the harvest, to allow them to more easily distinguish good practice from bad practice when it comes to the humane treatment of animals.

The full text of the amendments was published in the *Canada Gazette*, Part II, on March 4, 2009.

3.1.6 Governance

The Government of Canada (GOC) regulates the seal harvest through its Department of Fisheries and Oceans (DFO). Authorities for such regulation are derived through the Minister of Fisheries and Ocean, who is granted such authority through legislation. For example, key legislation such as the *Oceans Act*, *Species at Risk Act* and the

Fisheries Act comprise the core mandate and grant authorities in the area of seal management. On the ground, Fishery Officers at DFO closely monitor the harvest to ensure sealers comply with Canada's *Marine Mammal Regulations*. They monitor catches, ensure humane harvesting practices, and enforce regulations and licence conditions.

Canada has come under international criticism regarding the humaneness of the harvest, to the point where the European Union has instituted a ban on seal products, a position which appears to lack a scientific, legal or other credible basis. The ban was instituted despite significant collaboration between Canadian and European authorities, stakeholders, experts, and others. The Government of Canada has launched a WTO challenge against the ban .

3.1.7 Approval process

Several structured consultation meetings are organized in the regions in late fall, and one large Atlantic-wide Advisory meeting held in early winter.

It is at the Atlantic-wide meeting that issues are resolved and strategies developed, in an atmosphere of discussion and common ground. Recommendations are summarized into a memorandum of decision for the Minister, who then makes final management decisions.

3.2 Stock Assessment, Science and Traditional Knowledge

3.2.1 Biological Synopsis

3.2.1.1 Harp seal

The Northwest Atlantic population of harp seals summers in the Canadian Arctic and Greenland. In the fall most of these seals migrate southward to the area off southern Labrador and northern Newfoundland ("Front"), with about 25-30% of the herd entering the Gulf of St. Lawrence ("Gulf"). Harp seals give birth in both areas during late February or March on medium to thick first year pack ice.

Suitable ice is crucial for birth and successful rearing of the pup and for weaned animals to rest until they are ready to feed. Years when ice is very unstable or absent are associated with high levels of mortality. Male and female harp seals are similar in size with adults averaging 1.6 m in length and weighing 130 -150 kg.

Females nurse a single pup for about twelve days, after which they mate and then disperse. The pup, known as a whitecoat, moults its white fur at approximately three weeks of age after which it is referred to as a beater. Older harp seals form large moulting concentrations on the sea ice off northeastern Newfoundland and in the northern Gulf of St. Lawrence during April and May. Following the moult, seals disperse and eventually migrate northward. Small numbers of harp seals may remain in southern waters throughout the summer while a portion of the population remains in the Arctic.

3.2.1.2 Grey seal

The grey seal is a member of the family Phocidae that was first described by Fabricius (1791). Its name *Halichoerus*

comes from the Greek meaning “sea pig”, and *grypus* from the Latin meaning hook-nosed. In Canada, they are sometimes referred to as horse-head seals owing to the elongated snout of adult males.

The Northwest Atlantic grey seal forms a single population that is distributed on the continental shelf between Cape Chidley on the northern tip of Labrador and the northeastern United States, with the main areas of concentration in Canada being the Gulf of St. Lawrence, Scotian Shelf and Bay of Fundy.

Historically, the population has been divided into two components (Gulf and Sable Island), for management considerations based on the locations of the major pupping concentrations. However, recent increases in colonies along the Nova Scotia eastern and southern shores has led to the designation of a third component referred to as the Coastal Nova Scotia herd. As this herd grows further division may be required.

Grey seals are a coastal or continental shelf species. They haul out on exposed reefs or on beaches of undisturbed islands. Historically grey seals were abundant, and widely distributed along the Canadian east coast, and in the Gulf of St Lawrence where they were first hunted by Amerindians. Extensive hunting by Europeans, particularly after the disappearance of the Walrus (*Odobenus rosmarus*) in the Gulf and on Sable Island, resulted in the depletion of the grey seal population by the mid-1800s.

Males tend to be darker than females, in some cases almost black. They may reach a length of 231 cm, and weigh as much as 350 kg. Females are smaller, reaching 201 cm in length and weigh up to 227 kg. Breeding occurs on islands, isolated beaches or on the pack ice. Pups are born with a white lanugo, which they begin to shed approximately 15 days after birth and is completely replaced with a black spotted, silver coat by the time pups are 25 days old.

3.2.1.3 Hooded seal

The hooded seal is a large phocid inhabiting pelagic waters of the North Atlantic. Traditionally two main populations have been identified for management purposes, one in the northeast Atlantic and the other in the Northwest Atlantic. The Northeast Atlantic population whelps on the pack ice around Jan Mayen Island (West Ice), while Northwest Atlantic animals whelp off the northeast coast of Newfoundland (Front),in the Gulf of St. Lawrence (Gulf) and in Davis Strait. The relationships between the different breeding groups are poorly understood, but recent genetic analysis suggests that hooded seals form a single panmictic genetic stock. Seals from all three whelping areas in the Northwest Atlantic migrate to southeast Greenland to moult in July. Northeast Atlantic seals moult further north off northeast Greenland. Following the moult NW Atlantic hoods disperse to west Greenland and north to Baffin Bay. In the fall seals migrate to the Labrador and northeast Newfoundland coasts with some animals entering the Gulf of St. Lawrence.

Male hooded seals are larger than females and characterized by an enlarged nasal pouch which can be inflated, and is presumably used as a signal during the breeding season. Males may weigh up to 450 kg, while females may weigh up to 330 kg. The pups are born on pack-ice in mid-March and weigh about 22 kg at birth. They are weaned after 4 days by which time they have doubled their weight. Hooded seals moult their white lanugo coat in utero, and are born with a pelage that has long, slate blue-grey fur on their back and white underside, which is why they may also be referred to as bluebacks.

3.2.2 Ecosystem Interactions

3.2.2.1 Grey seal

Although they are located throughout Atlantic Canada for parts of the years, Grey seals are most abundant in the Gulf of St. Lawrence (4RST) and on the Scotian Shelf (NAFO zones 4VWX).

Over this broad geographic range, grey seals encounter different prey assemblages, with differing depth distribution and geographic extent. All of these factors are known to influence grey seal foraging behaviour and diet, and coupled with the different dynamics of the Gulf, Sable Island, and coastal Nova Scotia herds and their prey species, suggest that the influence of grey seals varies by ecosystem.

There is ongoing debate about the possible negative impacts of seal predation on fish populations particularly groundfish. One factor contributing to this debate is the growth in grey seal populations in eastern Canadian waters over the past five decades and the concurrent decline, or in some cases collapse, of several fish populations in the 1990s to the point where fishing has been stopped and there has been little sign of recovery. Natural mortality of adult fish has been estimated to be unusually high in these collapsed and non-recovering fish populations.

In 2010, DFO reviewed the impacts of grey seals on cod in the southern gulf of St. Lawrence (4T) and on the Scotian Shelf (4VsW)(for complete details, see Canadian Science Advisory Secretariat, Science Advisory Report 2010/071). Some of the main results indicate that:

- Predation by grey seals was the greatest contributor to increased mortality in large southern Gulf (4T) cod. Depending on model assumptions significant numbers of grey seals may have to be removed to favour cod recovery. Preliminary modelling suggests that removals would be beneficial to cod, but the full range of simulations to examine indirect ecosystem effects has not been completed.
- In 4VsW cod, seal predation was noteworthy but its magnitude compared to other sources of mortality varied with model assumptions. Currently, the high natural mortality among adult cod remains unexplained.

3.2.2.2 Harp seal

The harp seal is the most abundant pinniped in the Northwest Atlantic. They feed on prey at several different trophic levels and may play an important role in contributing to maintaining ecosystem structure. In some areas, such as the northern Gulf of St. Lawrence, they can have an important impact on recruitment of some species such as cod although they do not feed heavily on large cod and oceanographic conditions affecting larval and young fish survival have a more significant impact than harp seal predation. Off the Labrador coast and in Davis Strait they are an important component in the diet of polar bears and improvements in polar bear survival in Labrador and Davis Strait have been attributed to increases in the harp seal population. Off Newfoundland, harp seals have been estimated to consume significant quantities of groundfish, but they consume primarily smaller pre-recruits. Cod recovery in 2J3KL is thought to be affected more by availability of key prey species such as capelin than by seal predation.

3.2.3 Aboriginal Traditional Knowledge

3.2.3.1 Harp seal:

Bones from harp seal skeletal remains have been found in Archaeological digs along the Quebec north shore, Newfoundland and Labrador. Harp seals are also harvested by Inuit in the Canadian Arctic for food and trade. Considerable numbers of harp seals are harvested in Greenland. In recent years, the Greenland harvest has surpassed the Canadian commercial harvest. Inuit harvesters tend to harvest older animals than are taken in the Canadian commercial harvest.

3.2.3.2 Grey seal:

Grey seal remains have been found at Amerindian sites around the Gulf of St. Lawrence, coastal Nova Scotia and the north-eastern United States indicating that subsistence removals occurred when they were more abundant.

3.2.3.3 Hooded seal:

Hooded seals are an important to subsistence harvesters in Greenland, particularly Inuit along the east coast.

3.2.3.4 Ringed seal:

Distributed across the arctic region, the ringed seal is the primary seal species harvested by the Inuit.

3.2.4 Stock Assessment

Harp, hood and grey seals cannot be counted directly because they are dispersed for much of the year and when at sea spend much of their time below the surface. Assessments are based upon surveys that are completed during the breeding season when animals are concentrated at the breeding sites which may occur on land (grey seals) or on the ice (harp, hood, and grey seals). The pups are born on a solid platform and pass several days on the ice, before entering the water. The objective of the assessment is to count the pups while they are hauled out on the ice or on land. The assessments for these species consist of aerial surveys to detect all concentrations of pups, a survey to count the pups using visual / photographic methods and a survey to determine the timing of births, so that counts can be corrected for births occurring after the surveys were flown.

3.2.4.1 Harp seal

An aerial survey, flown every 4-5 years, to count the number of pups born on the pack-ice in the Gulf of St. Lawrence and off the east coast of Newfoundland and Labrador is the main tool used to evaluate the status of the population.

Additional information is collected annually. This includes data on age-specific reproductive rates, harvest levels in Canadian and Greenland harvests, and mortality estimates of young of the year on the ice.

A detailed assessment is completed approximately every five years, with annual updates to provide harvest advice to fisheries managers.

See Appendix 1 for survey results.

3.2.4.2 Grey seal

An aerial survey is flown every 3-4 years to count pups born on the ice, or on land, in the Gulf of St Lawrence, on Sable Island and along coastal Nova Scotia. Reproductive rate data are collected annually from the Gulf as well as harvest data throughout its range.

A detailed assessment is completed approximately every three-four years, with annual updates to provide harvest advice to fisheries managers.

See Appendix 2 for Survey results.

3.2.4.3 Hooded seal

The timing of aerial surveys to assess Northwestern Atlantic hooded seals has been irregular. The last survey to determine pup production in the Gulf of St Lawrence, at the Front and in Davis Strait was completed in 2005. The previous large scale surveys occurred in the early 1990s.

Harvest data are collected annually, while some reproductive data are collected each year. Harvest advice is provided as requested by the regulatory authority.

3.2.5 Precautionary Approach (PA)

While the GOC uses a variety of governance mechanisms such as legislation, management frameworks, policies, regulations and standards to ensure economically prosperous maritime sectors and fisheries, it also maintains an active seal research program to achieve a better scientific understanding of seals. This program is aimed at gaining a better understanding of fluctuations in seal populations and the factors that influence numbers, as well as the role of seals in marine ecosystems.

Areas of research include population dynamics, trends in reproductive performance, survival, migration, diving behaviour and diet analysis. The GOC also carried out research on how seals interact with other components in the marine ecosystem, including the relationship between fish stocks and seals. This research not only promotes a better understanding of seals and marine ecosystems, but will help ensure that appropriate resource management actions are taken following an ecosystem-based approach.

Atlantic Seal Management Strategy

Resource management requires tradeoffs between conservation and economic concerns in establishing harvest levels. In 2003, the Privy Council Office (PCO) developed a framework for the application of the Precautionary Approach (PA) in Science-based Decision Making. The Precautionary Approach (PA) brings scientists, resource managers and stakeholders together to identify clear management objectives and define management actions that are triggered when a population approaches or falls below agreed upon benchmarks.

Adopted in 2003, the Atlantic Seal Management *strategy* was developed in response to the Eminent Panel report on seal management. It provided a *framework* that identifies precautionary and critical reference limits which defined healthy, cautious and critical zones of abundance, along with management actions triggered when zone thresholds are exceeded, to reduce damage to the resource. The framework is consistent with both the PCO framework and the Department's PA framework developed in 2006 .

Within the context of fisheries management, the PA strives to be more cautious when information is less certain, does not accept the absence of information as a reason for the failure to implement conservation measures, and defines, in advance, decision rules for stock management when the resource reaches clearly stated reference points.

These points or levels are referred to as *Critical (Limit)*, *Precautionary* and *Target Reference Points*. One of the basic principles of PA is the need to account for the uncertainty associated with estimates and to develop a basis for taking action in cases with insufficient scientific understanding. Thus, protocols are needed for situations where considerable data are available ('data-rich') as well as for situations where information concerning the resource is more limited ('data-poor').

Scientists provide regular advice to managers based on biological assessments of an exploited resource. These assessments attempt to predict changes in the resource by incorporating information on catches, estimates of recruitment, and indices of abundance into a population model. Because the information is often incomplete and estimated, model parameters are subject to natural variability, and the resulting advice has considerable uncertainty.

In the past, failure to recognize the importance of this uncertainty led managers to require proof that populations or resources were in difficulty before action was taken. Unfortunately, by the time the damage could be determined, populations often had already suffered serious harm. The collapse of northwest Atlantic cod stocks and many large whale populations are examples where traditional management approaches have failed.

The amount of information available for resource management varies between species.

Therefore, it is necessary to define situations where there is considerable information on the population dynamics of a population as 'data-rich' and situations where data are more limited as 'data-poor'.

For Atlantic seal management, data-rich species require three or more abundance estimates over a 15 year period, with the most recent estimate obtained within the last five years. Current information (≤5 years old) on fecundity and/or mortality are also required in order to determine sustainable levels of exploitation. If these data are not available, the species would be considered as 'data-poor' and a more conservative management approach required. Currently harp seals and grey seals are considered as data-rich and are managed under the framework described below. Hooded seals are considered to be data-poor.

Atlantic Seal Reference Points

Under the Precautionary Approach, three types of reference points are identified to manage a population. The first is the Critical Limit or **Limit Reference Point** which is the level below which a population is considered to have likely experienced serious and irreversible harm. Below this level, all human induced removal should be stopped.

Because of uncertainty in our understanding of abundance and management actions, as well as the possibility of natural events that cannot be controlled, we manage populations at a higher level, the Buffer or **Precautionary Reference Point**.

Above this level, the population is considered to be healthy and conservation is not considered to be of greatest concern in relation to other objectives. In some precautionary frameworks, the various thresholds are set using estimates of pristine population size. However, estimates of pristine populations are highly uncertain. Under the

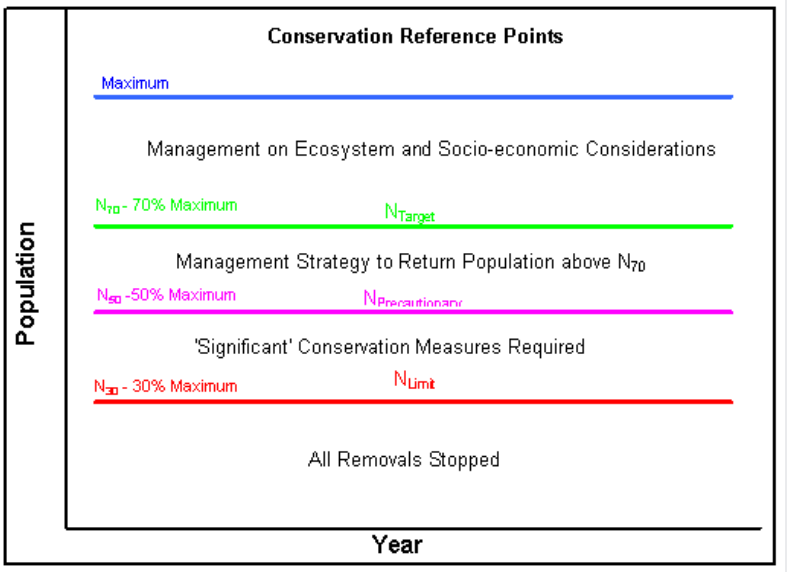
Atlantic Seal Management framework, the Limit Reference Point has been set at 30% of the maximum population estimated or inferred (i.e. N_{30}) while the Precautionary Reference Point has been set at N_{70} (i.e. 70% of the maximum). Futher work will be undertaken by a government-industry working group to examine whether N70 is appropriate as a Precautionary Reference Point for the purposes of the 2011-2015 plan.

When a population is within the healthy zone (i.e. above the Precautionary Reference), a third reference point, referred to as the **Target Reference Point**, can be set.This is the level at which industry and management would like the population to remain.

In the case of a commercially important species such as the harp seal, this may be at a high level (e.g. near the maximum observed population; N_{max}) to maximize quotas. For a species such as the grey seal where there are concerns about their impact on the recovery of prey populations, the target level may be closer to the Precautionary Reference Point.

This framework was implemented in 2003 to replace the high-risk replacement yield approach. Since then, the Northwest Atlantic harp seal population has been at or near the highest levels ever seen, coincident with some periods of intensive harvesting.

This figure identifies three conservation reference points used to manage the Atlantic seal population: the limit reference point, the precautionary reference point and the target reference point. As described in the paragraph above, the target reference point is the optimal level for the seal population to remain.



3.3 Social, Cultural and Economic Context of the Fishery

Sealing is culturally important to coastal communities in Atlantic and Northern Canada. It has been described as a time honoured tradition and a way of life among the Inuit, demonstrating individual harvesting skills and expressing cultural pride and identity. For the Inuit, the seal harvest is integral to maintaining relationships within and among

communities.

Canada's seal harvest is also an economic mainstay for numerous rural communities in Atlantic Canada, Quebec and the North. It supports many coastal families that can derive as much as 35% of their annual income from this practice. The harvest traditionally takes place from late March until mid May, during a period when other income-generating opportunites are limited in many of these communties.

Participants in the industry are widespread and diverse. There are approximately 6,400 active commercial licenses in Atlantic Canada and another 6,000 non-commercial harvesters in Nunavut. The seasonal processing industry employs approximately 500 people.

Harp seals (*Pagophilus groenlandicus*) are the main commercial species. It is the most abundant of all the seal species in Atlantic Canada and accounts for the vast majority of the harvest. Traditionally, seals have been harvested for meat and for pelts, both to use locally and to sell. Pelts have been historically the most commonly-sold commercial product although prices have been highly volatile over the years, resulting in large fluctuations in the economic value of the industry.

Socio-Economic Profile of the Industry

Harvesting

In 2010, approximately 390 people participated in the Atlantic Canada Seal harvest. This number is down significantly from 2009 which reported 1,755 active participants. Similarly, the number of active vessels in 2010 dropped to 106, from 540 active vessels the previous year.

The total value of seal landings has been decreasing since 2006, when it was valued at over $34 million and sealers received over $100 per pelt. Significant drops in both the quantity and value of harvested pelts, punctuated by large fluctuations in pelt prices, mainly accounted for this trend. The value of the harvest remained considerably low in 2010 ($1.3 million) and pelt prices were approximately $20 per pelt.

Many external factors have also contributed to the downward shift in industry. The industry relies heavily on the export market and a strong Canadian dollar drastically dampens export values. Ice cover is also an important consideration. In recent years, ice cover has been significantly reduced making seal harvesting more difficult.

The following table contains four columns. The first column lists the year; the second column lists the landed value of seals in millions which is broken down into sub columns of pelts and other (meat and oils); the fourth column lists the total landed seals value; and the fifth column lists the number of pelts landed by thousand.

Seal Landings 2004-2010

Year	Landed Value (millions)		Total	Landings no.Pelts (‘000)
	Pelts	Other*		
2004	$16.0	$0.6	$16.6	362
2005	$17.3	$0.3	$17.6	316

2006	$33.9	$0.4	$34.3	348
2007	$11.7	$0.5	$12.2	224
2008p	$6.8	$0.1	$6.9	215
2009p	$1.0	$0.1	$1.1	91
2010p	$1.2	$0.06	$1.3	67

* This includes the landed value for meat and oils. p - Preliminary data

Processing

There are four main processing establishments in Atlantic Canada, one in British Columbia, and an auction centre in Ontario. Processing companies undertake primary processing, which entails removing the blubber from the pelts, curing the pelts and rendering the blubber into consumption grade Omega 3 oil.

Generally, some processing of pelts is done at the point of origin whereas the processing of seal oil, collagen, protein powder and meat is done in fish processing plants. For years, most pelts received little processing and were only salted and shipped out to foreign processors. Over the past few years, however, about half of the pelts harvested in Newfoundland and Labrador were fully processed to the tanned stage and ready for secondary processing such as garment production. [1]

The Government of Newfoundland and Labrador (NL) estimates that approximately 500 individuals are employed in seasonal seal processing jobs in the province. Quebec estimates processing employment at 60 participants. These numbers fluctuate depending on the size of the harvest for any given year.

In 2010, seal oil processing was the primary industry driver. Experts also note that moving existing inventory is a key industry consideration.

Trade

Canadian seal exports are made up of three major commodities: seal pelts used largely for clothing, seal oil used in Omega 3 health supplements and seal meat.

Seal pelts are sold on the world market based on grade and colour. Seal pelts/oils may be purchased and dispersed by brokers, before being produced into final products. Final products for seal pelts include garments, hats, boots, mittens, trims, seal leather items, and novelty items. Up to 90% of Canada's exports of seal pelts are destined for Russia, most of which are first exported to Norway. Some products also pass through Finland, Turkey and a number of European ports.

The following table contains four columns. The first column lists the year; the second column lists the export value in millions of seal product which is broken down into sub columns of pelts, oils and meat; the fourth column lists the total export value; and the fifth column lists exports by product in thousands and is divided into sub columns pelts, oils and meat.

Overall, Canada's seal and seal products exports have experienced declines since 2006 when total exports were over $16 million. The most recent 2010 data indicate that the quantity and value of seal exports remain close to the low levels experienced in 2009.

Exports, 2004-2010

Year	Export Value (millions) by Product			Total	Exports by Product ('000)		
	Pelts	Oils	Meat		Pelts (#)	Oils (kg)	Meat (kg)
2004	$11.7	$0.7	$0.4	$12.8	280	672	72
2005	$13.4	$1.8	$0.3	$15.5	203	2,401	91
2006	$16.4	$1.5	$0.1	$18.0	249	1,219	33
2007	$8.6	$4.3	$0.1	$13.0	91	5,310	54
2008	$6.5	$3.3	$0.2	$10.0	123	792	62
2009	$0.18	$2.56	$0.005	$2.75	6.2	740	1.1
2010	$0.8	$1.3	$0.07	$2.17	27.4	309	20

The following lists three tables. The first table has two columns. The first column lists the country, the second column lists the value of seal pelt exports in 2008. The second table has two columns. The first column lists the country, the second column lists the value of seal pelt exports in 2009. The third table has two columns. The first column lists the country, the second column lists the value of seal pelt exports in 2010,

Largest Seal Pelt Exports by Country of Destination, 2008-2010

2008

Country	Value ($)
Norway	3,882,053
Finland	1,887,908
Latvia	510,249
Others	197,720
Total	**6,477,930**

2009

Country	Value ($)
Estonia	149,170
France	15,400
China	13,694
Others	2,973
Total	**181,237**

2010

Country	Value ($)
Germany	666,110
Finland	137,348
Japan	5,994
Others	3,529
Total	**812,981**

The past three years have seen significant changes in the seal pelt export market, particularly the decrease in export values from $6.5 million in 2008 to $813,000 in 2010. The countries of destination have been changing as well: Norway was once a stable market destination for pelts, but has since declined. Recent significant markets such as

France, Germany and Estonia have been closed resulting from the European Union ban on all commercial seal products.

Seal oil is used in Omega 3 health products, oils for use in paints (Finland) and for fuel in Northern/Inuit communities. Over 80% of seal oil products are sold to Asian markets such as China and South Korea. Norway is another key market for seal oil. The EU represents 5% of seal oil exports, which could be reduced by the implementation of the ban on commercial seal products.

The following lists three tables. The first table has two columns. The first column lists the country, the second column lists the value of seal oil exports in 2008. The second table has two columns. The first column lists the country, the second column lists the value of seal oil exports in 2009. The third table has two columns. The first column lists the country, the second column lists the value of seal oil exports in 2010.

Seal Oil Exports by Country of Destination - 2008 and 2009

2008

Country	Value ($)
S.Korea	1,270,304
China	1,103,469
Norway	364,100
Others	610,314
Total	**3,348,187**

2009

Country	Value ($)
China	1,190,318
S.Korea	698,702
Norway	338,000
Others	331,808
Total	**2,558,828**

2010

Country	Value ($)
S.Korea	675,474
Norway	291,200
Taiwan	143,809
Others	196,849
Total	**1,307,332**

Seal meat exports are generally destined for South Korea, Japan, Taiwan and Hong Kong. In order for seal meat to be exported, it must be processed in a Canadian Food Inspection Agency (CFIA)-registered and inspected facility. Seal meat exports may also be regulated by importing states. In 2008, 91% ($141K) of all seal meat exports were destined for Japan. The remainder went to South Korea ($13K) and France ($1K). In 2009, seal meat exports were virtually negligible, because there were no meat exports to Japan and South Korea that year. There are indications of potential markets for seal oil and meat in China.

Imports

Imports of seal pelts into Canada between 2000 and 2008 averaged just over 3,100 pelts per year. These imports were likely to ensure sufficiently available products to meet market demands. In 2009, the number of seal pelts imported into Canada increased to 35,777 (from 2,112 in 2007). This could be explained, in part, by the low landings in 2009, prompting processors to look elsewhere for raw materials to process.

The most recent data for 2010 (January to September) indicates that the quantity and value of seal pelt exports have grown marginally and remain at the low levels experienced in 2009. Additionally, the preliminary 2010 data for seal oil is indicating a sharp decline in value and quantity.

3.4 Management Issues (RM)

3.4.1 Fisheries Issues

IFMPs are required to cover all aspects of a fishery, in particular, those related to the sustainability of target species and by-catches, ecosystem considerations and gear and fleet issues.

Long Term Sustainability

The last decade has seen a decline in overall suitable ice cover in Atlantic Canada. In years with little ice-cover, storm activity further breaks up the ice. This may lead to increased mortality among young animals. Currently increased mortality due to poor ice conditions is considered in the assessment when evaluating the effects of different harvest levels on the population. These parameters are adjusted annually, to account for changes in conditions and estimated mortality. To date, ice conditions have not had a major impact on the herd, but the winter of 2009/10 was characterized by almost no ice in the Gulf, and conditions for 2010/11 appear to be similar. Although mortality among young can be high under these conditions, harp seals may respond through a shift in distribution towards more northerly regions.

There has been a general decline in age-specific reproductive rates suggesting that density-dependent factors are acting to limit the growth of the population. Given that surveys are only completed every five years, it is not possible to estimate what the environmental carrying capacity might be. There is considerable by-catch associated with certain gillnet fisheries e.g., lumpfish. These fisheries are not considered to pose a conservation risk to the herd, but recovery in groundfish fisheries will likely result in more removals. The Greenland subsistence harvest is currently not-regulated and is considerably larger than the Canadian commercial catch (estimated > 85,000 annually). Older animals are taken in the Greenland harvest. In 2008, the Northwest Atlantic harp seal herd was estimated at 8 to 8.7 million animals depending on assumptions used in the assessment model.

While issues around climate change, ice cover and reproductive success need to be monitored, there are no imminent sustainability issues respecting the commercial exploitation of the seal resources in Atlantic Canada and Quebec.

Maintenance of long-term sustainability is promoted through the application of the Precautionary Approach.

The Three-Step Process

The most contentious management issue in recent years has related to animal welfare considerations. The Department responded to these concerns developing and implementing the three-step process for killing seals. The three-step process, which was based on the recommendations of the Independent Veterinarians Working Group, was set in the Marine Mammal Regulations in 2009. It is now an integral part of the commercial seal harvest. A key priority has been ensuring that all sealers receive adequate training in the three-step process and that compliance levels are high.

Regional Shares

There has been long standing disagreement over regional shares in the Gulf of St. Lawrence. In 2008, an Independent Review of Sharing Arrangements for the Commercial Harp Seal Harvest in the Gulf of St. Lawrence was completed

by Pierre-Marcel Desjardins. Mr. Desjardins proposed a number of possible sharing arrangements, none of which were acceptable to industry participants. In 2010 the Minister stabilized regional shares for five years (2010-14 inclusive), maintaining the status quo: 70% Gulf-Newfoundland; 20% Magdalene Islands; 8% Quebec North Shore; and 2% Maritimes.

Remaining at issue are the facts that sharing arrangements are imposed, rather than negotiated, and that strict sharing arrangements do not accommodate seasonal variations: for example, in one year, Gulf ice was plentiful and close to shore, and Magdalen sealers had no difficulty fulfilling their quota. The next year, sealers were idle as seals moved northwards in search of ice on which to pup and wean.

An agreement between participants is more desirable, but status quo is adequate given that in recent years, quotas were rarely achieved.

Developmental Allocations

In 2009, the Minister introduced Developmental Allocations with a view to encouraging new initiatives in the seal industry. Developmental allocations can be provided for special projects outside the developed commercial structure. That same year saw the approval of a five-year developmental allocation of 10,000 seals per year for 2010-2014, to support two value-added projects (heart valve research and meat products), presented by the seal industry in the Magdalene Islands. However, due to poor ice conditions, Minister accepted to postpone the developmental allocation of 10,000 seals per year for 2011-2015.

The 2010 Total Allowable Catch for harp seals included 20,000 animals reserved for developmental allocations, before Regional shares were applied. Also in 2010, an allocation of 5,000 animals was requested by, and granted to, the Nunatsiavut government.

Training and Certification

Canadian commercial seal harvest practices have been under scrutiny for a number of years. The Department is committed to supporting the professionalization of the sealing industry. Since 2009, the Canadian Council of Professional Fish Harvesters (CCPFH) has been spearheading the development of a training regime, with the full support and cooperation of the provinces, industry and associations.

All groups are encouraging the implementation of mandatory training and certification of sealers as soon as possible. As training is not in the mandate of the Department, DFO's role will be initiating a regulatory process to propose that sealer training and certification be established in the regulations for the 2012 season. The establishment of a training program will mean the lifting of the licensing freeze, which has been in place while this program is enabled.

On-going activities in support of professionalization of sealers include the establishment of standards to articulate the required skills and knowledge, a certification system to ensure that existing sealers and new entrants acquire and maintain these competencies, and the development and delivery of training in priority areas. These areas include the three step process for animal welfare, and protocols for harvesting of seals intended to be commercially marketed for human consumption.

Grey seals

There is ongoing debate regarding seals, particularly grey seals, and their interaction with commercial fishing. They are the most important host for the codworm (*Pseudoterranova decipiens*), a nematode worm that also infects groundfish and must be removed during processing. Grey seals are also blamed for gear damage, lack of stock recovery, and interference with migratory and breeding patterns of commercial species.

In June 2009, as part of management measures for Gulf cod, the Minister directed the Department to ensure the targeted removal of grey seals in the Gulf of St. Lawrence that are preying on southern Gulf cod as part of its conservation approach. At that time, the department's most recent peer-reviewed assessment indicated that grey seal predation appeared to be a significant component of the very high mortality rates of cod in the southern Gulf.

A recent Zonal Advisory Process regarding grey seals and their interactions with fish stocks examined several potential reasons for the lack of recovery of cod in the southern gulf and concluded that grey seal predation was the greatest contributor to increased mortality in large southern Gulf (4T) cod and the most likely reason for lack of recovery of cod in this area, while on the Scotian Shelf it was concluded that grey seal predation was not the main reason for the lack of recovery of cod in this area, although they are responsible for a significant component of natural mortality. It remains to be seen whether action against grey seals will be taken in an effort to aid cod recovery.

Industry has been vocal in its protests of DFO inaction, has called for a special Advisory meeting on grey seals, and has boycotted regional advisory meetings on other species in some areas.

Mandatory Vessel Registration

Newfoundland and Labrador region, supported by the other regions, have a long-standing request to improve monitoring and tracking aspects through mandatory registration of sealing vessels. Current regulations and policy do not require sealing vessels to be registered.

Amendments to the *Marine Mammal Regulations* and to the *User Fees Act* are required before vessel registration can be implemented.

Regulatory Amendments

Further amendments could be introduced to ensure that the three-step process is comprehensively reflected in regulations. It has further been proposed that DFO introduce animal welfare principles to the *MMR* in language designed to prevent unnecessary pain, distress or suffering of the animal.

3.4.2 Depleted species concerns

N/A

3.4.3 Oceans and habitat considerations

Canada's 2005 Federal Marine Protected Areas Strategy is establishing a federal network of protected ocean spaces including Marine Protected Areas under the *Oceans Act*, National Marine Conservation Areas administered by Parks Canada, and Marine Wildlife Areas administered by Environment Canada. Migratory Bird Sanctuaries with marine components, such as the one at Sable Island, are also included. A goal of the the Strategy is for protected

areas to be “established and managed within an integrated oceans management framework, that contributes to the health of Canada's oceans and marine environments”, where individual areas serve as “a mechanism to conserve and protect the structure and function of larger marine ecosystems”. The development of management approaches to the dramatically increased grey seal herd on Sable Island should reflect this goal, and should benefit from the science and management efforts that have been invested in understanding and conserving the Sable Island ecosystem.

3.4.4 Gear Impacts

Gear used includes hakapiks, rifles, shotguns and gaffs. None have environmental impact, although it is suggested that further restrictions of ammunition type and shotgun use may be required.

3.4.5 International Issues

European Union Restrictions on the Importation of Seal Products

The European Union (EU) regulation restricting the importation and sale of seal products within its territory entered into force in the Fall of 2009. The ban associated with the regulation came into effect in August 2010.

Exceptions to the ban include products resulting from Inuit/indigenous harvests; products for the sole purpose of sustainable management of marine resources; and, for the personal use of the travelers. In addition, the ban does not apply to seal products trans-shipped through the EU to non- EU destinations.

Canada has initiated a challenge of the EU ban, as well as EU member state bans in Belgium and the Netherlands, at the World Trade Organization. Canada is seeking a ruling that the EU bans are contrary to international trade law obligations.

An Inuit-led group has initiated two separate challenges of the EU seal ban regulation at the European General Court. The Court has agreed to hear the first challenge that alleges that the EU exceeded its legal competency with the introduction of the seal ban regulation. A separate ruling is pending on whether the Court will hear a second case targeting the implementing measures (exceptions to the ban).

Inuit-Led Challenge

On January 13, 2010, the Inuit Tapiriit Kanatami (ITK) announced that the Canadian and Greenland Inuit and stakeholders in Canada, Greece, Norway and Greenland had filed an application for annulment of the EU seal regulation. The application was lodged in Brussels with the General Court of the European Union on January 11, 2010.

On August 18, 2010, the EGC granted a request to the plaintiffs (ITK led group) for an interim injunction, thus temporarily suspending the implementation of the regulation, for the applicants until the Court has considered evidence from the defendants. After reviewing arguments by EU defendants against the suspension, the European Court released a decision on October 28 to rescind the temporary suspension.

Canada-China Cooperative Arrangement on Market Access for Edible Seal Products

In January 2011, Canada and China concluded efforts aimed at opening the Chinese market to Canada's exports of

edible seal products. Canada will be in a position to export these products to China following implementation of new food safety requirements stemming from the cooperative arrangement.

Seals Strategic Business Plan

The Seals Strategic Policy and Priorities (SSPP) group is leading the development of a strategic business plan for the seal products industry as part of the larger Departmental initiative to revitalize the sector. International Affairs Directorate will continue to provide support on the file. The Seals Strategic Business Plan represents a Federal-Provincial-Territorial collaboration on comprehensive market development strategy focused on support for sealer professionalization, support for innovative product development, and coordination among jurisdictions on communications and litigation initiatives.

International Sealing Standards

The Government of Canada is exploring options for advancing efforts aimed at the development of international guidelines for the humane harvesting of seals.

3.5 Objectives long term and short-term (RM)

3.5.1 Long-term objectives – and integral short-term objective

3.5.1.1 Maintain healthy, abundant seal populations and stable Total Allowable Catches

- maintain the Precautionary Approach (PA)
- maintain N30 as a Critical or Limit Reference Point
    - Establish DFO-Industry Working Group to review management options that respect PA, to develop Target Reference Points, and to complete a more thorough evaluation of the management strategy through model simulations
    - Discussion and model simulations may lead to some adjustments in the precautionary threshold, currently at N70 (or 70% of the maximum observed population size)
    - N30 is 30% of the maximum and is a point of fishery closure
- Support market-driven approach to harvest levels which requires professional sealing workforce throughout the Atlantic Region, and management approaches that ensure optimal access (e.g., flexible sealing areas, carry forwards)

3.5.1.2 Explore Application of Ecosystem Approach to Seal Management

- Continue the work of the Grey Seals Working Group to focus sealing, fishing, management, and science expertise on 1) predator-prey interactions and 2) options for expanding the grey seal harvest.
- Broadly disseminate results from Grey Seals work, and promote the development of research agendas and planning objectives for other harvests / fisheries that are mutually supportive.

3.5.1.3 Establish and Implement Standards for Animal Welfare

- Collaborate with sealing industry, provinces, federal agencies, training and certification bodies, veterinarians, and the others as appropriate in the elaboration of the existing science basis supporting the three-step process.
- Collaborate with the sealing industry, enforcement officials, training and certification bodies, and others as appropriate in the identification of compliance checkpoints which articulate how the standards are to be met in practice

3.5.1.4 Industry fully engaged in the Stewardship of the resource

- Ensure engagement of seal harvesters in the development and implementation of plan objectives.
- Work with Provinces and Territories, Federal Agencies and Councils, Certification Boards, and Training Providers in support of Professionalization of Seal Harvesters and associated training and certification. This support includes proposal of federal regulatory requirement for mandatory training. Ensure that federal requirements related to animal welfare and marketing of edible seal products are addressed in the training.
- Support sealing industry efforts to:
    - implement animal welfare provisions in the Marine Mammal Regulations, including collaboration between industry and veterinary experts.
    - adopt protocols for the identification of healthy seals and proper handling of seals intended for the meat and oil market.
    - develop innovative products including the use of seal tissues for application in human medicine.
    - maintain and/or ex PA nd a sealing workforce throughout the Atlantic region to ensure harvesting capacity is available to meet market demand. This support may include lifting of the freeze on new licences.
    - Address safety at sea concerns, including a regulatory requirement for vessel registration
- ensure an orderly, well managed harvest, including a requirement for trip limits

3.5.1.5 Consideration of social, cultural, and economic factors

- Socio-Cultural: increase public awareness of the importance of sealing to Inuit and Atlantic Canadians for community cohesion, nutrition, and well-being.
- Economic: promote the identification and development of economic opportunities related to sealing activity.

3.5.1.6 A high level of compliance with regulations and licence conditions is achieved

- Effective monitoring, control and surveillance of the seal harvest in the Gulf of St. Lawrence and in the Newfoundland & Labrador (Front) areas;
- An orderly, well-managed seal harvest with a high level of compliance with seal fishery management measures, rules and regulations, including the prohibition on the harvest of whitecoat and blueback seals.
- Concerted enforcement efforts to promote strong compliance with regulations and licence conditions related to animal welfare and the three step process. The use of proper harvesting techniques and tools will be strictly enforced;
- Monitoring of, and compliance with, quotas, licences, including hail, log and landings verification.
- Compliance with the regulatory provisions and licence conditions applicable to observation of the seal harvest.

Compliance monitoring for anticipated new regulatory requirements during the period covered by this plan, namely, mandatory training and registration of sealing vessels.

- A coordinated flow of accurate information to support decision-making, including weekly tele-conference between NHQ and regional C&P coordinators during peak seal harvesting times to evaluate the implementation of the operational plans.

3.6 Access and Allocation (RM)

3.6.1 Current sharing arrangements:

In 2010 the Minister stabilized regional shares for five years (2010-14 inclusive), continuing to use the existing allocation formula.

2006 Harp Seal Share Percentages - Gulf of St. Lawrence

Quebec North Shore 8%

Magdalen Islands 20%

Western Newfoundland 70%

Gulf/Maritime Provinces 2%

The 2006 TAC for harp seals was 335,000. Allocations for all sectors are presented in Table 1.

The following table lists the allocation of harp seals. The first column lists the fleet shares; the second column lists their share of the commercial allocation by percentage.

Table 1: Allocation of Harp Seal TAC

Fleet Shares / Allocations	Share of Commercial Allocation
Commercial	
Labrador	3.69 %
Front	
Front 35' to 65'	40.61 %
Front < 35'	27.29 %
Front Total	67.90 %
Gulf	
Gulf Newfoundland	19.89 %
Magdalen Islands	5.68 %

Quebec North Shore	2.27 %
NS / PEI / NB	0.57 %
Gulf Total	28.41 %
Commercial Total	100.00 %

3.6.2 Quotas and allocations

In 2009, the Minister introduced the concept of Developmental Allocations, whereby quota amounts are set aside for special projects outside the developed commercial structure that will encourage novel and unique application in the seal industry.

In 2009, the Minister approved a developmental allocation of 10,000 seals per year for 2010-2014, to support two value-added projects presented by the seal industry in the Magdalen Islands. The first proposal is for seal meat product development and market expansion by the specialized Côte à Côte butcher shop in the Magdalen Islands. The second proposal is for ongoing research into the potential of seal heart valves and other seal tissues in human transplant procedures led by Ta Ma Su Inc., in partnership with experts in the medical field from Canada and abroad. However, due to poor ice conditions, Minister accepted to postpone the developmental allocation of 10,000 seals per year for 2011-2015.

In 2010, an allocation of 5,000 animals was requested by and granted to the Nunatsiavut government. Neither of these allocations were accessed during the 2010 season.

Fisheries and Oceans Canada will consider all proposals for value-added projects that support innovation, sustainability, and market development in the industry and contribute to its long-term economic viability.

The 5-year allocation to the medical- and food-related projects, and the single-year allocation to the Nunatsiavut government, will be extended to the 2011 season upon departmental receipt and review of harvesting plans. For 2011, there remain 5,000 animals unallocated from the 20,000 available.

During consultation on this issue at the 2010 Atlantic Seal Advisory Committee meeting, it was agreed that the allocation must be managed under both a development plan and a harvesting plan presented by the applicants, to be approved by the DFO in advance of the granting of the allocation. Plans should address sealer participation, types of seals required, timing, and areas to be harvested. More details regarding the proposals can be made available if the developmental and harvesting plans are approved and the developmental allocation granted.

Developmental allocations are not subsidies to an industry, nor are they commercial, competitive, company or regional allocations. They are independent of the Regional Shares structure, and are to be implemented **outside** of a competitive fishery or commercial allocation context. It is to be stressed that these allocations are not permanent, but are made available only to encourage development of new products and markets. Furthermore, to the extent that landings data may be used in the determination of future shares, care will be taken to ensure that any landings associated with Developmental Allocations are **not** considered within the sharing formula.

Qualification for access is not to be construed as the right to access. If proposals, plans and approvals are complete and any other necessary requirements are fulfilled, the allocation may be granted, at the discretion of the Minister or the Minister's delegate (e.g., Regional Director General). The plans must be thorough and in compliance with the existing sustainability and Precautionary Approach framework for sealing in Canada, the *Marine Mammal Regulations*, and applicable license conditions. Conclusion or cessation of the project by any cause will conclude access to the allocations, and seals will need to be sourced from the commercial quota.

3.7 Management Measures for the Duration of the Plan

3.7.1 Total Allowable Catch (TAC)

TACs are established, based on advice that considers the long-term impacts of various harvest levels.

Harp Seals - A multiyear TAC will be established for three consecutive seasons, though the Minister may set an annual TAC to account for new information on the status of the population, changing environmental conditions, and changes in harvest levels in Arctic Canada and Greenland.

The overall TAC of harp seals is subdivided into commercial sealing allocations applicable to different areas and fleet sectors, a personal use allocation for all areas, a subsistence allocation for northern communities, and a developmental allocation as described in section 3.6.2

Seals harvested by sealers licensed in an area or sub-area are counted against the allocation for that area or sub-area, regardless of the area in which they are taken.

Local Advisory Stakeholder Groups are consulted on any in-season reallocations or sub-allocations among sectors or areas.

Carry forwards may be available to fleets that did not catch their quota the previous year. The maximum carry forward will be 20% of the initial allocation. This amount is subtracted from the overall TAC prior to sub-allocation. Any overages in any fleets from previous years are subtracted from the carry forward.

Hooded Seals - The TAC is adjusted to account for new information on the status of the population, changing environmental conditions, and changes in harvest levels in Arctic Canada and Greenland. There will be no harvest for hooded seals in the Gulf of St. Lawrence.

Grey Seals - TACs are set for the Gulf of St. Lawrence and the Scotian Shelf. Harvesting remains prohibited on Sable Island and other protected areas.

Ringed and Bearded Seals - There are no TACs or allocations set for these species. Licences and permits are used to control any commercial harvest of these seals.

Harbour Seals - Commercial harvesting for harbour seals is not permitted under this management plan.

Subsistence Catches - Subsistence harvesting takes a small number of harp, hooded, grey, ringed, bearded, and harbour seals.

3.7.2 Fishing Seasons/Areas

Seasons and areas are set by the *MMR*. The season for the commercial harvest of harp and hooded seals is established in consultation with sealing fleets and set out in Variation Orders pursuant to the MMR, taking into account environmental and biological conditions. It can be adjusted by Variation Orders to accommodate changing circumstances.

The majority of sealing occurs between late March and mid-May, beginning around the third week in March in the southern Gulf of St. Lawrence, and about the second week in April off Newfoundland (the Front). The timing of harvest activities in the northern Gulf of St. Lawrence depends largely on the movement of ice floes on which seals are located. The peak commercial harvest in this area is in early April.

The season for the subsistence harvest of ringed seals in Labrador is from April 25 to November 30 as established in the *MMR*.

The grey seal harvest is also set by Variation Order and is based on consultations with participants, taking into account scientific advice.

Residents of Labrador north of 53°N latitude and the Arctic (Sealing Areas 1 to 4 - see map) can harvest seals of any species at any time of the year for subsistence purposes, except as specified for ringed seals below. Aboriginal persons can also harvest seals throughout the year for food, social, and ceremonial purposes and as provided in Land Claim Agreements.

Maps may be found in the Appendix.

3.7.3 Control and Monitoring of Removals

Removals in the seal harvest are closely monitored via observer coverage, dockside monitoring, logbooks, hailing, and VMS.

3.7.4 Opening / Closing

Harp seals

The commercial harvest takes place in traditional sealing areas on the Front (Sealing Areas 5 to 8) and in the Gulf (Sealing Areas 9 to 16, 20, 22, 26, and 27 - see map in Section 15). As per the *MMR*, the season is from November 15 to May 15. Regional Directors General (RDGs) may alter the seasons (close times) by publicly issuing Variation Orders. In Quebec, the season is established under license classes (by publicly issuing Variation Orders). The taking of whitecoat seals is prohibited.

The personal use hunt is allowed off NL south of 53°N latitude and off Quebec's North Shore, the Gaspé Peninsula, and the Magdalen Islands. In NFLD coast, the season is the same as the commercial season and is established by the period of validity on licences. In Quebec, personal use sealing season is established under license classes (by publicly issuing Variation Orders). It is illegal for personal use licence holders to take whitecoats.

Hooded seals

The commercial season is from November 15 to May 15 in Sealing Areas 4 to 7, and 12. RDGs may alter the seasons (close times) by publicly issuing Variation Orders. Sealing Areas 8 to 11 and 13 to 33 (see map in Section 15) are areas where hooded seals have not been harvested and they remain closed. The taking of young hooded seals (bluebacks) is prohibited.

Personal use licences may allow hooded seals to be taken in areas where the commercial season is open. It is illegal for personal use licence holders to harvest bluebacks.

Grey seals

There are no personal use licences issued to harvest grey seals. In an effort to encourage the development of a commercial grey seal harvest, based on the establishment of products and markets, a multiyear TAC for grey seals will be announced. Subject to the National Nuisance Seal Licence Policy and Proceedures, full time fishers may be eligible to be issued a nuisance seal licence for grey seals if it can be satisfactorily shown that their fishing operations are being detrimentally impacted by grey seal predation. The requirements of the MMR, sections 28- 29 inclusive, apply in respect to the harvesting of grey seals.

The timing of the grey seal harvest is controlled by condition of licence. The small commercial harvest near the Magdalen Islands may occur in January and February, and other grey seal harvests may be approved on a case-by-case basis. No harvesting should occur at breeding colonies during the period when females are nursing.

Ringed and other seals

The season for the subsistence harvest of ringed seals in Labrador is from April 25 to November 30. The taking of bearded and harbour seals taken for subsistence purposes is allowed throughout the year.

Control and monitoring of removals

Removals in the seal harvest are closely monitored via observer coverage, dockside monitoring, logbooks, hailing, and VMS.

3.7.5 Decision rules - as prescribed by the PA.

3.7.6 SARA requirements - N/A

3.7.7 Licensing

Notwithstanding the current licence freeze and the issuance of temporary and personal licences, licences are not required by Labrador residents north of 53°N latitude harvesting seals in Sealing Areas 1 to 4 for food purposes. They are also not required by Aboriginal people harvesting for food, social, or ceremonial purposes and who are not the beneficiaries of a claims agreement.

The *Commercial Fisheries Licensing Policy for Eastern Canada (1996)*, made under authority of the *Fisheries Act (FA)*, governs the issuance of sealing licences.

Under the authority of this policy, professional commercial sealing licences may be issued only to full time or bona

fide fishers registered with DFO who:

a. held a professional sealing licence the previous year; or
b. have participated in the seal harvest during the previous two years as the holder of an assistant sealing licence.

Assistant sealing licences may be issued only to persons who are in possession of written confirmation, from a professional sealer, to the effect that the assistant sealer will be harvesting seals under the supervision of the professional sealer during the sealing season.

Personal use sealing licences, allowing the harvest of up to six seals a year for personal consumption, may be issued only to residents who:

a. live adjacent to established sealing areas throughout Newfoundland, in Labrador south of 53°N latitude, on Quebec's North Shore, the Gaspé Peninsula, and the Magdalen Islands; and
b. held a personal use sealing licence in the previous year; or
c. hold a valid provincial harvesting licence for big game or a harvester's capability certificate to demonstrate their proficiency with firearms and have attended a mandatory information session on regulations, safety and the proper handling of harvested seals.

3.7.8 Habitat Protection Measures - N/A

3.7.9 Training and Certification

In 2009 and 2010, the Canadian Council Professional Fish Harvesters (CCPFH) attended by sealing industry representatives and provincial and federal officials. There was unanimous support for implementing a professionalization strategy with a mandatory sealer training and certification requirement.

Under this approach, provinces will deliver training and certification. DFO will set requirements in policy or regulation. The Council, with funding support from Human Resources and Skills Development Canada, will continue to play its facilitation and coordination role working with governments and industry to deliver the training tools and certification requirements.

On-going activities in support of professionalization of sealers include the establishment of standards to articulate the skills and knowledge needed, a certification system to ensure that existing sealers and new entrants acquire and maintain these competencies, and the development and delivery of training in priority areas. These areas include the three step process for animal welfare, and protocols for harvesting of seals intended to be commercially marketed for human consumption. The Department hopes to see a formal regime in place for the 2012 season.

3.7.10 Quota Sharing

In the face of long-standing disagreement between sealing groups in different geographic areas regarding the fairness of Regional shares, the Desjardins report was commissioned, and in late 2008 reported on several mechanisms for resolving the question, none of which were acceptable to participants.

In the 2010 Seal Harvest Decision Memo, the Minister stabilized regional shares for five years (2010-14 inclusive), continuing to use the 2006 allocation formula.

In 2009, the Minister introduced the concept of Developmental Allocations, whereby quota amounts are set aside for special projects outside the developed commercial structure that will encourage novel and unique application in the seal industry.

The 2010 Total Allowable Catch for harps seals included 20,000 animals reserved for developmental allocations, before Regional shares were applied. The approval of a five-year developmental allocation of 10,000 seals per year for 2010-2014, to support two value-added projects (heart valve research and meat products), presented by the seal industry in the Magdalene Islands. However, due to poor ice conditions, Minister accepted to postpone the developmental allocation of 10,000 seals per year for 2011-2015.

Also in 2010, an allocation of 5,000 animals was requested by and granted to the Nunatsiavut government.

3.7.11 Mandatory Vessel Registration

A critical issue is the lack of mandatory registration of sealing vessels. Mandatory registration would lead to more efficient monitoring and control of vessels.

In fisheries which do not require Vessel Monitoring Systems, unregistered vessels are more difficult to track, especially in such a widespread activity as the seal harvest. Knowing that a vessel was leaving port to participate in the harvest simplifies Coast Guard tracking and departmental enforcement monitoring.

There is no current requirement to register a sealing vessel. Many sealing vessels are already registered through activity in other fisheries, but many smaller vessels are not, particularly in Newfoundland and Labrador.

The Working Group determined that a nominal cost recovery fee should be levied, as it is believed that without a charge, many users would register their vessels on simple speculation, as is currently the case regarding unused sealing licences.

The implementation of user fees, triggering the *User Fees Act* (UFA), is a multi-step process that begins with ministerial support and the formulation of a charging rationale, then will proceed to more applied practices that include costing, the establishment of service standards, pricing, and stakeholder consultation.

Mandatory registration will require both an amendment to the *Marine Mammal Regulations* (MMR) and the establishment of a registration fee through the *User Fees Act* (UFA). Preliminary discussions have taken place internally to map the way forward.

3.8 Shared Stewardship Arrangements

Input to management planning and decision making is provided through annual consultation sessions with sealers in each administrative area, followed by an Atlantic-wide Advisory Committee Process. Sealers and others are actively engaged in a number of activities that support the objectives of this management plan (see Stewardship objectives, section 3.5.1.4).

3.9 Compliance Plan (C&P)

3.9.1 Conservation & Protection Program Description

The national Conservation & Protection seal harvest program is specified in the annual "Atlantic Seal Harvest - Monitoring, Control, and Surveillance (MCS) Plan", including provisions for the Gulf of St. Lawrence and Newfoundland and Labrador (Front) based seal harvests. This plan is developed annually by C&P NHQ in consultation with regional C&P operations staff.

The priority for the Department of Fisheries and Oceans (DFO) is to ensure the sustainable management and an orderly and humane seal harvest. This is achieved through the management measures laid out in the seal management plan, including the effective monitoring, control, and surveillance (MCS) functions. See section 3.5.1.6 for MCS Objectives.

3.9.2 Regional Compliance Program

The C&P compliance activities used to achieve these objectives include:

- Dedicated service of a CCG ice-breaker.
- Dedicated service of ship and land based CCG helicopters and charter helicopters.
- Dedicated services of inter-regional Fishery Officer teams.
- Use of remote monitoring (camera) technologies.
- Fixed wing aerial surveillance
- At Sea Observers
- Vessel Monitoring Systems (VMS)
- Mandatory reporting requirements.
- Landings site and buyer station inspections.
- Liaison with RCMP and other provincial police agencies.

The plan outlines sector, division and area responsibilities, and encompasses respective strategies to help achieve the stated objectives of an orderly, well-managed seal fishery. Specific strategic considerations are given priority. These include:

- Maintain compliance through a sustained surveillance and enforcement presence (air, sea and dockside) for the duration of the fishery.
- Effective utilization of surface and aerial platforms capable of direct and sustained responses to emerging conservation concerns. Platforms will be used to determine levels of activity and compliance with management measures.
- Communication of compliance issues in a timely and effective manner.
- Recognition of defined roles and responsibilities to maintain an effective flow of information through the identified channels.
- Receipt, compilation and transmission of catch statistics in a timely and systematic fashion to effectively

manage quotas.
- Timely transmission of public-interest information to Communications.
- Issuance of seal harvest observation licences in a coordinated and effective manner.

3.9.3 Consultation

Annual consultations are held with other monitoring partners/ agencies including the Royal Canadian Mounted Police (RCMP), Department of National Defence (DND), the Maritime Security Operations Center (MSOC), Canadian Coast Guard (CCG) and the Sureté du Québec to ensure coordination of roles and responsibilities during the operation of the harvest.

Information sessions are also conducted annually in advance of the seal harvest with fishing industry representatives, and individual sealers to apprise them of the regulations for the coming harvest and emphasize the proper methods for humane harvesting.

3.9.4 Compliance Performance

The compliance performance may be measured by a number of indicators, including:

- Observations of humane harvesting (three step process)
- Number of seals checked (including skull checks to verify proper striking)
- Number of vessels checked
- Number of sealers checked
- Number of incidents
- Number of violations / warnings.
- Number of resulting charges
- Compliance with overall TAC, quota & allocations
- Compliance with prohibitions
- Compliance with observer permit conditions
- Feedback from sealers, Fishery Officers, public.

3.9.5 Current Compliance Issues

Current compliance issues cover the spectrum of activities under the *Marine Mammal Regulations* and the Fisheries Act however, the major concern and the area of increased MCS effort is associated with humane harvesting (implementation of the three step process).

In addition to increased MCS operations related to humane harvesting there appears to be a greater requirement for communication, education and training (information sessions) regarding the requirements on humane aspects of sealing.

3.9.6 Compliance Strategy

The following table contains three columns. The first column lists the difference compliance issues, the second

column lists the regulations for each and the third column lists the strategies used to monitor compliance.

COMPLIANCE STRATEGIES

ISSUE	*Regulation*	*Strategy*
Monitor harvest and enforce regulations, (inc. three step process)	Sections 8, 28 and 29 of the *MMR*	• aerial surveillance • on-site inspections • observer coverage **& remote camera**
Maintain accurate reporting of landings and quota compliance	Section 22 of the Fishery (General) Regulations (*FGR*)	• in-port inspections • observer coverage • on-site inspections
Monitor by-catches of seals	Section 5 of the *MMR* and Section 33 of the *FGR*	• in-port inspections • observer coverage • on-site inspections
Ensure that no whitecoats or bluebacks are harvested	Licence condition	• aerial surveillance • on-site inspections • in-port inspections • observer coverage & **remote camera**

3.10 Performance Review (RM)

3.10.1 Management Objectives Evaluation Criteria

Performance indicators

Objective: Maintain healthy, abundant seal populations and stable Total Allowable Catches

- Science advice and management measures (e.g., options for harvest levels) discussed at Advisory Committee
- Management measures established, consistent with Government of Canada and Department of Fisheries and Oceans policy on Precautionary Approach, science advice and considering input from sealing industry

Objective: Explore Application of Ecosystem Approach to Seal Management

- Science basis for predator-prey relationship between Grey seals and groundfish communicated to industry and public
- Management approaches to support commercial scale grey seal harvest are underway, informed by focused discussions among managers, industry, science and others

Objective: Establish and Implement Standards for Animal Welfare

- International and / or Interjurisdictional Animal Welfare standards established for the seal harvest

- Concept of Animal welfare is better defined via science / research, development of principles, and guidance is in place to translate principles to practice

Objective: Industry fully engaged in the Stewardship of the resource

- Industry supported by a sealing workforce capable of meeting market demand for seal products
- Industry has had meaningful input in the development of plan objectives
- Industry is supportive of certification and mandatory training, and committed to attend training sessions
- Industry has capacity to contribute to management and science efforts, especially related to animal welfare

Objective: Consideration of social, cultural, and economic factors

- Communications by government or industry representatives include appropriate messages related to the socio-cultural and economic significance of the seal harvest.
- Economic opportunities identified by industry or economic studies are evaluated and pursued where appropriate

Objective: A high level of compliance with regulations and licence conditions is achieved

- Establishment of compliance checklist based on regulations.
- On-going collection of compliance data from various sources
- Comparative enforcement statistics / reports from previous year's enforcement efforts.
- Implementation of new technologies for compliance monitoring
- Identification of areas of suspected non-compliance
- Documentation of follow up actions.

Glossary Terms (General)

Aboriginal Traditional Knowledge (ATK): Knowledge that is held by, and unique to Aboriginal peoples. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs and medicines.

Abundance: Number of individuals in a stock or a population.

Age Composition: Proportion of individuals of different ages in a stock or in the catches.

Biomass: total weight of all individuals in a stock or a population.

By-catch: The unintentional catch of one species when the target is another.

Communal Commercial Licence: Licence issued to Aboriginal organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* for participation in the general commercial fishery.

Conservation Harvesting Plan (CHP): Fishing plans submitted by all gear sectors which identify harvesting methods aimed at minimizing the harvest of small fish and by-catch of groundfish.

Dockside Monitoring Program (DMP): A monitoring program that is conducted by a company that has been

designated by the Department, which verifies the species composition and landed weight of all fish landed from a commercial fishing vessel.

Ecosystem-Based Management: Taking into account of species interactions and the interdependencies between species and their habitats when making resource management decisions.

Fishing Effort: Quantity of effort using a given fishing gear over a given period of time.

Fishing Mortality: Death caused by fishing, often symbolized by the Mathematical symbol F.

Food, Social and Ceremonial (FSC): A fishery conducted by Aboriginal groups for food, social and ceremonial purposes.

Groundfish: Species of fish living near the bottom such as cod, haddock, halibut and flatfish.

Landings: Quantity of a species caught and landed.

Maximum Sustainable Yield (MSY): Largest average catch that can continuously be taken from a stock.

Natural Mortality: Mortality due to natural causes, symbolized by the mathematical symbol M.

Observer Coverage: When a licence holder is required to carry an officially recognized observer onboard their vessel for a specific period of time to verify the amount of fish caught, the area in which it was caught and the method by which it was caught.

Pelagic: A pelagic species, such as herring, lives in midwater or close to the surface.

Population: Group of individuals of the same species, forming a breeding unit, and sharing a habitat.

Precautionary Approach: Set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resource, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.

Quota: Portion of the total allowable catch that a unit such as vessel class, country, etc. is permitted to take from a stock in a given period of time.

Recruitment: Amount of individuals becoming part of the exploitable stock e.g. that can be caught in a fishery.

Research Survey: Survey at sea, on a research vessel, allowing scientists to obtain information on the abundance and distribution of various species and/or collect oceanographic data. Ex: bottom trawl survey, plankton survey, hydroacoustic survey, etc.

Species at Risk Act (SARA): The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.

Stock: Describes a population of individuals of one species found in a particular area, and is used as a unit for fisheries management. Ex: NAFO area 4R herring.

Stock Assessment: Scientific evaluation of the status of a species belonging to a same stock within a particular

area in a given time period.

Total Allowable Catch (TAC): The amount of catch that may be taken from a stock.

Traditional Ecological Knowledge (TEK): A cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.

Tonne: Metric tonne, which is 1000kg or 2204.6lbs.

Validation: The verification, by an observer, of the weight of fish landed.

Vessel Size: Length overall.

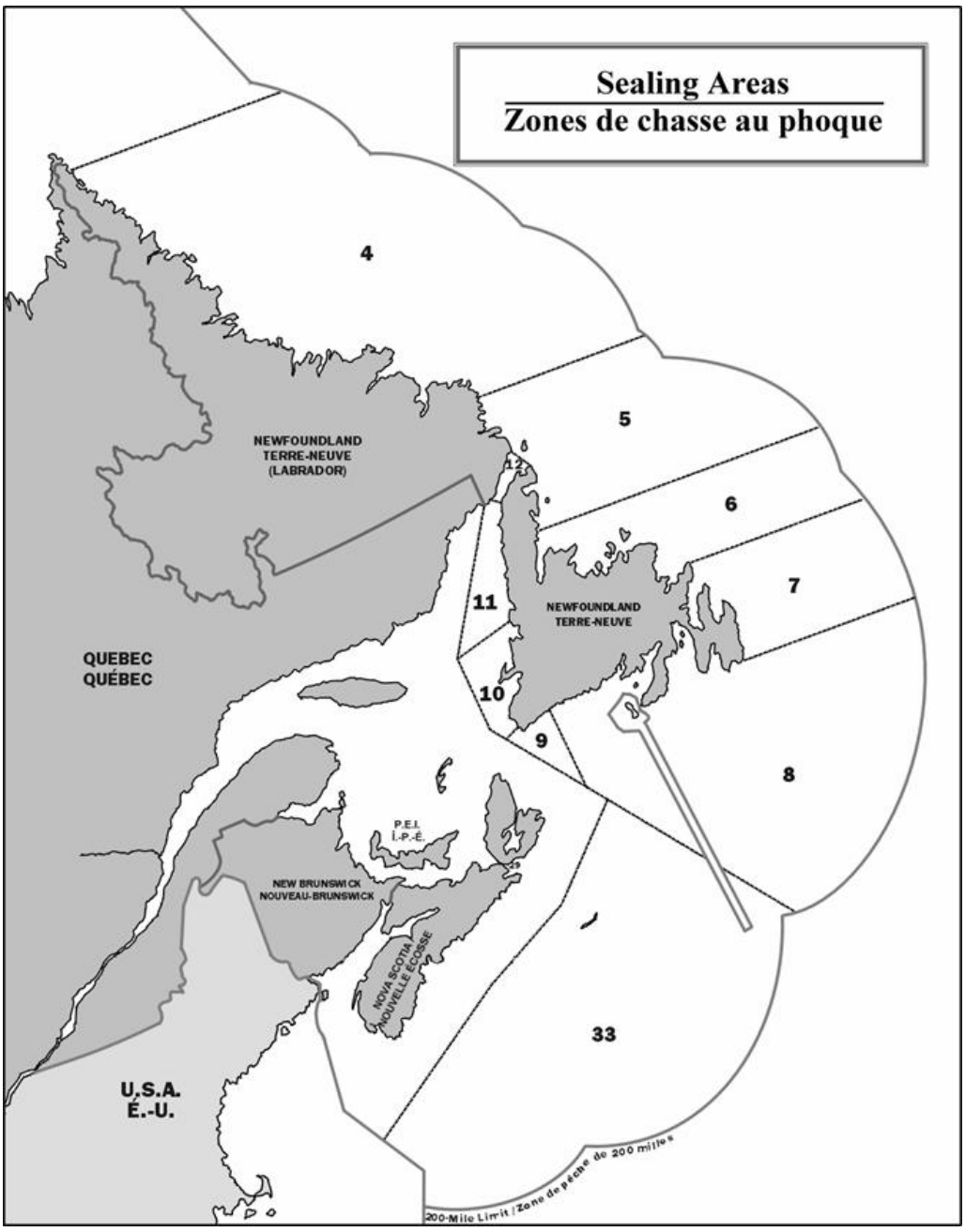
Maps of Sealing Areas

The following map shows sealing areas 1, 2, 3 and 4, which cover the Yukon, the Northwest Territories, Nunavut, and Northern Labrador.

MAPS

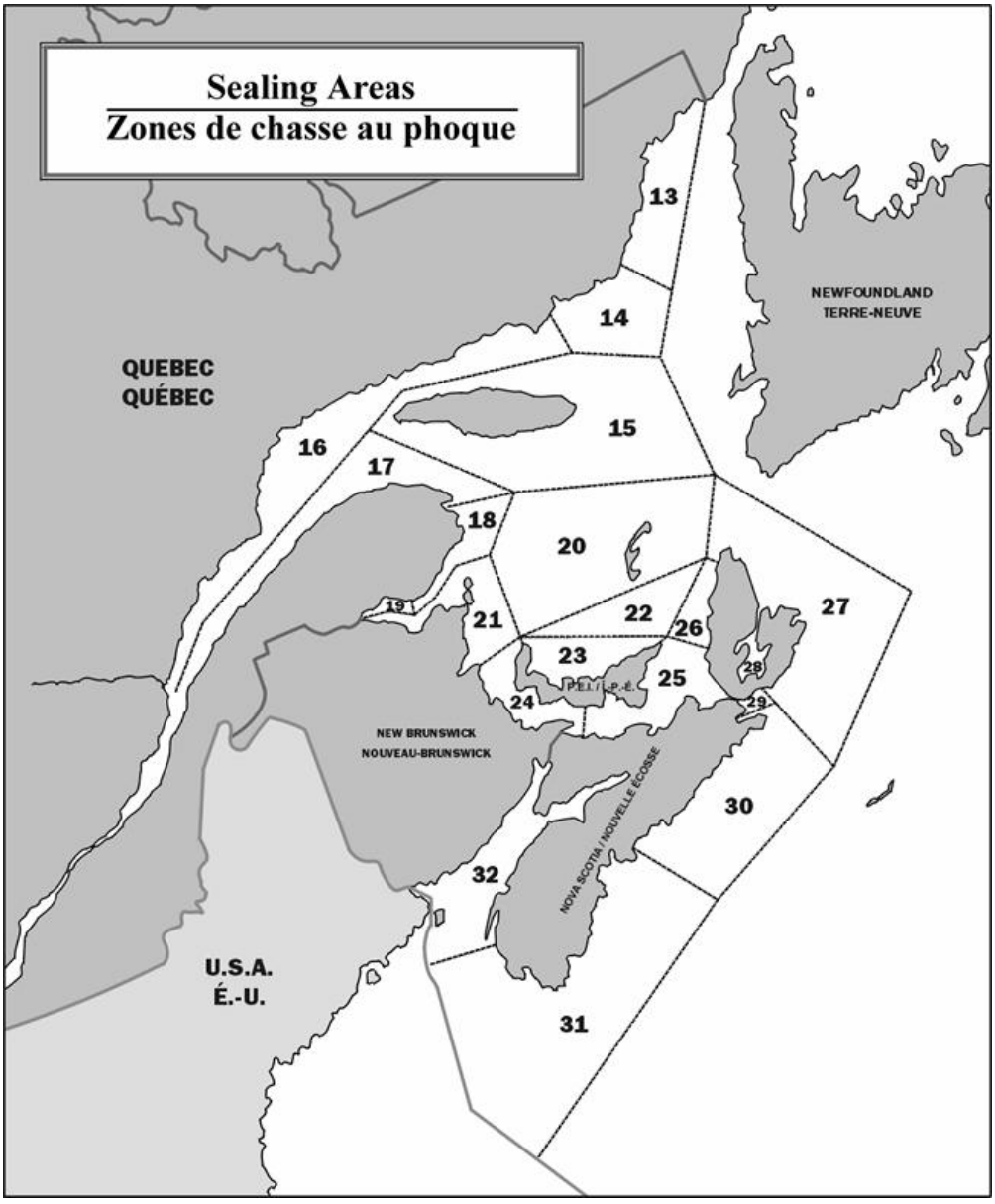
The following map shows sealing areas 4 to 11 and 33 which cover Newfoundland and Labrador, the area known as the Front.

FRONT SEALING AREAS



The following map shows sealing areas 13-27 and 30-32, in the area known as the Gulf of St. Lawrence. This covers Quebec, New Brunswick, Prince Edward Island and Nova Scotia.

GULF SEAL FISHING AREAS



APPENDIX 1: 2008 Harp seal population assessment

The Northwest Atlantic harp seal population is assessed using a population model that incorporates information on removals, environmental conditions, age-specific reproductive rates and aerial surveys to estimate pup production. The surveys are flown every 4-5 years to estimate the number of pups born, while information on age specific reproductive rates is obtained annually via a collector network in Labrador and Newfoundland. Information on environmental conditions and removals from the various harvests are available annually, although there is a delay in obtaining information on the Greenland subsistence harvest of about 2 years.

Pup production has been estimate from mark-recapture experiments and aerial surveys (Table harp 1). A survey flown in 2008, resulted in a pup production estimate of 1,630,300 (95% CI: 1,414,000 to 1,846,000; SE=110,400) animals.

The following table contains three columns. The first column lists the year, the second column lists the estimated pup production numbers, and the third column lists the Standard Error which represents how well the mean value of a

sample estimates the mean value of a population.

Table 1: Pup production surveys used as input into the population model.

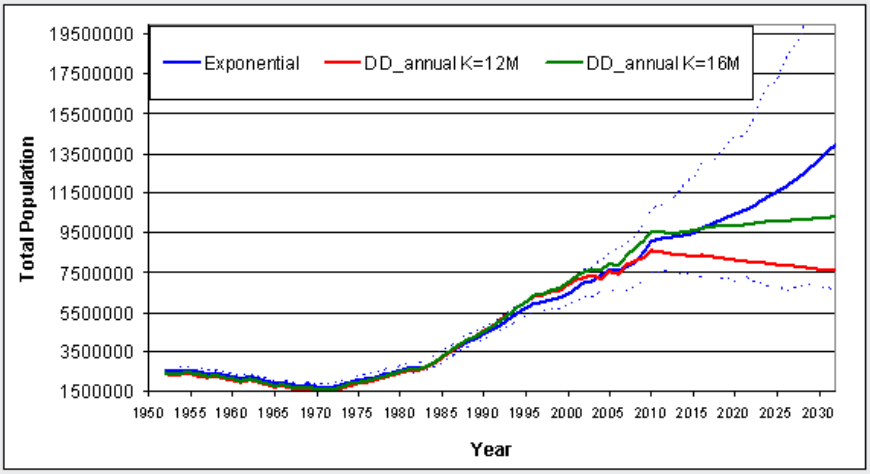
Year	Estimate	Standard Error
1951	645,000	322,500 [1]
1960	235,000	117,500 [1]
1978	497,000	34,000
1979	478,000	35,000
1980	475,000	47,000
1983	534,000	33,000
1990	577,900	38,800
1994	702,900	63,600
1999	997,900	102,100
2004	991,400	58,200
2008	1,630,000	110,400

[1] Assumed a coefficient of variation of 40%.

Reproductive rates have shown a declining trend since the 1970s, with the reproductive rates among adults declining from approximately 0.9 to 0.63 in the 2000's.This decline has also been associated by a marked increase in the variability between years in reproductive rates, with rates for adults of as low as 0.4 in 2004 to as high as 0.75 in 2007. These changes along with declines in size at age suggest that the population is no longer growing exponentially, but is instead showing signs of density-dependent regulation through reproductive rates. Changes may also be occurring in juvenile and adult mortality rates, but it is not possible to obtain independent estimates of these parameters. Furthermore, because the population is only survey every 4-5 years it is extremely difficult to determine what the upper limit of the carrying capacity for the population might be. Under the assumption that the population has been growing exponentially (traditional approach), the 2008 population is estimated to be 8.0 million (95% CI =6.8-9.3 million) animals, increasing to 9.1 million (95% CI=7.5 to 10.7 million) animals in 2010. Under the assumption that density-dependent population growth is occurring and the population is nearing a carrying capacity (K) of 12 million, then the 2008 estimate of the population is 8.1 million (95% CI=7.3 to 8.9 million), increasing to 8.6 million (95% CI 7.8 million to 9.4 million) in 2010. Increasing K to 16 million, then the population in 2008 was 8.7 million (95% CI=7.8-9.8 million animals) increasing to 9.6 million (95% CI=8.5 to 10.8 million) animals in 2010. Under these model formulations a harvest of up to 400,000 animals over the next three years would continue to respect the management plan to maintain an 80% probability that the population would remain above N70.

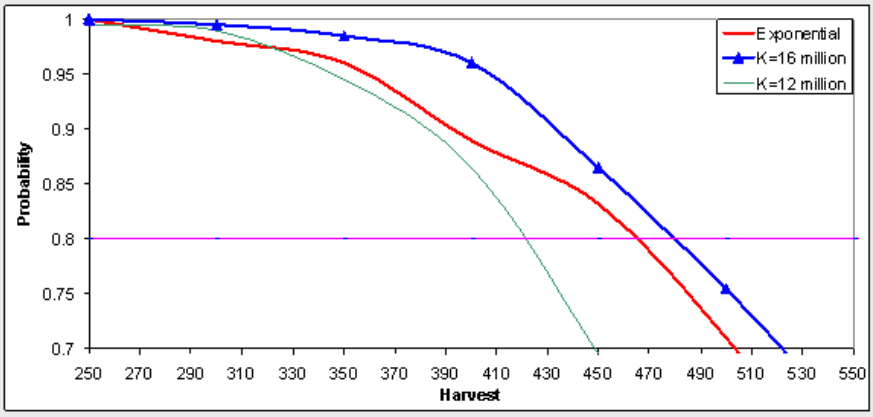
The following graph shows the increased population changes in the Northwest Atlantic harp seal from 1952 to 2010 and predicted changes from 2010 to 2030 under different model assumptions if the annual harvest was 325,000 animals. The different models used were {a} exponential growth and {b} density-dependent growth. The density-dependent model was applied using 2 scenarios: if the carrying capacity (K) of the population is assumed to be either 12 million animals, or 16 million animals. The dotted lines represent the 95% confidence intervals.

Figure 1. Changes in the Northwest Atlantic harp seal population (1952-2010) and predicted changes under different model assumptions (exponential growth, density-dependence assuming K=12 million or 16 million) and an annual harvest of 325,000 animals. The dotted lines are the 95% confidence intervals for the exponential growth model.



The following graph lists the exponential model and density-dependent model for seals described in the paragraph above under two scenarios of carrying capacity, this figure illustrates the probability (numbers on the vertical y-axis) that various harvest levels (numbers along the horizontal x-axis) will respect the current management plan objective to maintain an 80% probability of remaining above N70 (N70 = 70% of highest observed population).

Figure 2. Probability of different harvest levels respecting the management objective to have an 80% probability of remaining above N70.



APPENDIX 2: 2010 Grey seal population assessment

The Northwest Atlantic grey seal population gives birth on Sable Island, on the pack ice in the Gulf of St. Lawrence and on small islands in the Gulf and along the east coast of Nova Scotia. Visual strip transect surveys were flown over the whelping patches on the ice in the Gulf of St. Lawrence and multiple counts were completed at islands in the Gulf and along the coast of Nova Scotia. Where possible, counts were corrected for the proportion of pupping completed at the time of the survey.

Pup production in the Gulf has been more variable. It has increased from roughly 7,000 animals in 1984 to 11,000 in 1996, but has fluctuated between 6,100 and 15,600 since then (Table 2). Prior to 1996, 95% of the non-Sable Island pups were born on the ice, while the remainder was born on islands within and outside of the Gulf of St. Lawrence.

Due to a series of winters with poor ice conditions, particularly since 1997, the proportion of pups born on the ice

declined to approximately 80% of production during the assessments of 1997, 2000, and 2004, then declined further to approximately 30% of total non-Sable Island production in 2007. Pup production along the coast of Nova Scotia has increased from a few hundred in the early 1990s to about 3,000 in 2007 and 2010.

The number of pups born at small breeding colonies in southwest Nova Scotia, however, has doubled between 2007 and 2010 and has expanded to adjacent islands. Pup production along the coast of Nova Scotia accounted for approximately 18% of the non-Sable Island pup production in 2010.

The following table contains three columns. The first column lists the year, the second column lists the mark-recapture estimates for non-Sable grey seal pup production from 1984 to 1990 and the third column lists the aerial surveys estimates of the population in 1996, 1997, 2000, 2004, 2007 and 2010.

Table 2. Estimates of Non-Sable grey seal pup production, from mark-recapture (M-R) and aerial surveys, rounded to the nearest 100. The mark-recapture method was replaced after 1990 by aerial survey methods. Standard errors are in brackets.

Year	Mark-recapture estimates	Aerial survey estimates
1984	7,200 (900)	
1985	6,700 (800)	
1986	5,600 (700)	
1989	9,700 (900)	
1990	9,000 (600)	
1996		11,100 (1,300)
1997		7,300 (800)
2000		6,100 (900)
2004		15,600 (1,200)
2007		13,000 (600)
2010		14,200 (6,400)

On Sable Island, the numbers of pups born were assessed using an aerial digital-photographic census. A total of 58,000 pups was counted on the digital imagery. Once corrected for proportion of pups that died prior to the survey and the proportion of pups born before the survey, estimated total pup production was 62,000 (SE=600).

Pup production on Sable Island increased at an exponential rate of 12.8% per year between the 1970s and 1997. However, since 1997 surveys indicate that there has been a decline in the rate of increase to about 4% per year between 2007 and 2010 (Table 3).

The following table contains three columns. The first column lists the total counts of estimated Sable grey seal pup production from 1984 to 1990 and the second column lists the aerial survey estimates of Sable grey seal pup production from 1998, 1990, 1993, 1997, 2004, 2007 and 2010.

Table 3. Estimates of Sable grey seal pup production, total count and aerial surveys. Standard errors are in brackets.

Year	Total counts	Aerial survey estimates
1984	5,900 (300)	
1985	5,600 (300)	
1986	6,300 (300)	
1987	7,400 (300)	
1988	8,600 (300)	
1989	9,700 (400)	11,200
1990	10,500 (600)	10,450 (550)
1993		15,500 (500)
1997		25,400 (800)
2004		41,500 (4,400)
2007		54,500 (1,300)
2010		62,000 (600)

Total pup production of Northwest Atlantic grey seals in 2010 was 76,300 (SE=6,500). This includes 62,000 (SE=600) pups born on Sable Island, 3,000 (SE=100) along the coast of Nova Scotia, and 11,300 (SE=6,400) in the Gulf of St. Lawrence.

Most pups (81%) are born on Sable Island, 15% are born in the Gulf and 4% are born along the coast of Nova Scotia. This distribution has changed over time, with a decline in the fraction of the population born on the ice compared to on small islands, and an increase in the proportion of animals born on the coast of Nova Scotia, compared to the Gulf.

On Sable Island there has been an increase in the age at first birth and a reduction in apparent survival of juveniles over the last decade. For example, the proportion of animals aged 5 years old appearing for the first time with a pup has declined from 30% during the period 1985-1989 to 12% during 1998-2002. The reduction in the rate of increase in pup production and observed changes in age of first birth provides evidence of changes in the vital rates of this population.

In the Gulf herd, the mean age at first birth is 5 years old. This has not changed since the late 1960s, nor have changes been observed over time in age-specific pregnancy rates.

There are no data on age-specific pregnancy rates for the coast of Nova Scotia.

Population Model

A stochastic (random) discrete-time modelling framework called a state-space model was used to estimate total population size from pup production data from 1977-2010. The model was used to estimate Northwest Atlantic grey seal population size in 2007. The population was divided into three breeding regions: Sable Island, Gulf of St Lawrence, and coast of Nova Scotia.

Pup surveys completed approximately every 4 years combined with estimates of age-specific reproductive rates and removals are incorporated into a Bayesian (degree of belief) population model to determine total abundance. Females are allowed to move from their natal area to a new region to breed, but once they start breeding they do not move. A Bayesian computer-intensive method was used to fit the model, with informative priors on model parameters.

The end results for some parameters were close to their prior assumptions, indicating that there was little new information about these parameters in the pup production data. Other parameters were far from the prior: in particular the posterior estimates of carrying capacity were far higher than the prior values.

These results indicate little evidence of density-dependent population regulation at current levels of pup production for the Sable and Gulf herds. Model results suggest strong density dependence for the coastal Nova Scotia herd, dominated by the pupping colony on Hay Island.

The variability associated with model parameters, as well as potential changes in natural mortality rates due to changes in environmental conditions add uncertainty to the non-Sable Island population estimates. Additional uncertainty is associated with the application of reproductive rate data from the Gulf to the Sable Island herd.

The total estimated population size at the end of the 2010 breeding season (i.e., including pups) was 348,900 (95% CI 291,300-414,900; Figure 2). This is 4% higher than the equivalent estimate for 2009 of 335,200 (95%CI 292,000-395,100) and an order of magnitude higher than the estimate for 1977 of 35,800 (95%CI 24,700-53,100). Estimates of average annual rates of population increase from the model were 6% in the 1980s, 9% in the 1990s, and 6% in the 2000s.

The following lists four graphs. The first graph shows an increase in the estimated trend of the Northwest Atlantic grey seal population from Sable Island from 1977 to 2010. The second graph shows an increase in the estimated trend of the Northwest Atlantic grey seal population from 1977 to 2010. The third graph shows an increase in the estimated trend of the Northwest Atlantic grey seal population from the Coast of Nova Scotia from 1977 to 2010. The fourth graph shows the increase in the estimated trend of the Northwest Atlantic grey seal population for all three regions combined. The estimated population in 1977 was 35,800 seals and it increased to an estimated 348,900 in 2010.

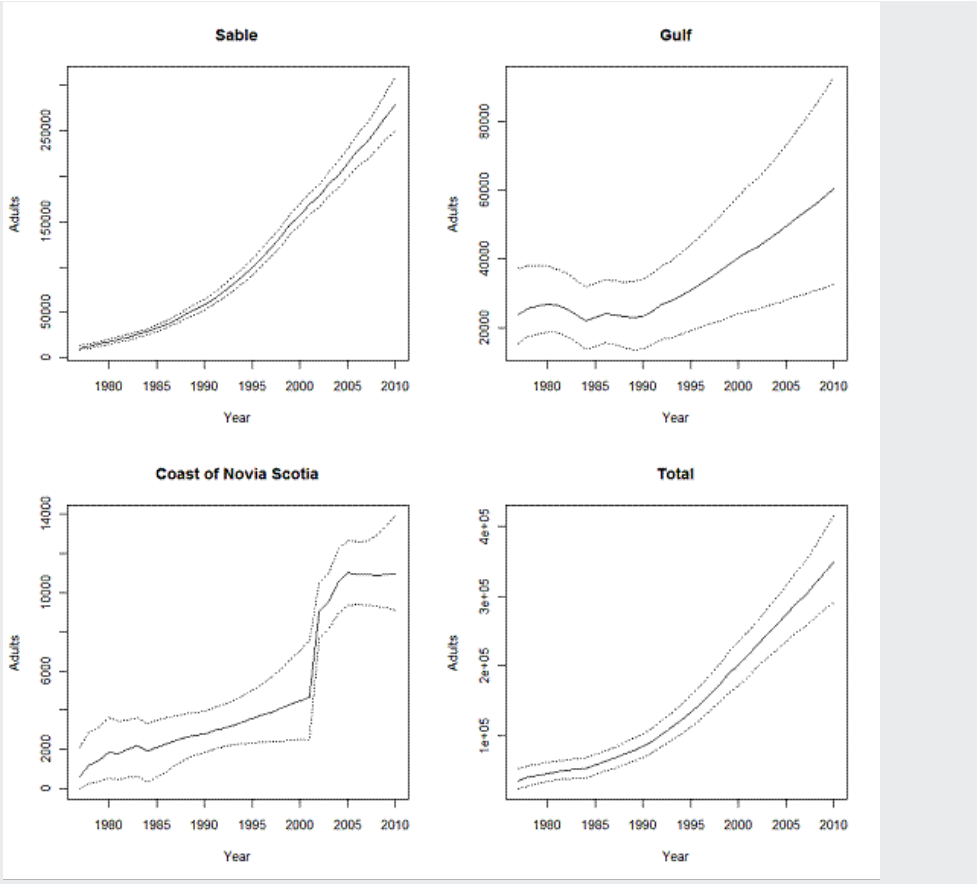


Figure 3. Estimated trajectories of the different herds and the total Northwest Atlantic grey seal population.

Assessment of Population Consequences of Harvest Strategies

The outputs of the population dynamics model were used to investigate the consequences of a range of harvest strategies. Populations were simulated using the posterior distribution of model states and parameters from the fitted model, and then projected forward stochastically for up to 20 years under different harvest regimes.

The management objective was to find harvest levels that have an 80% probability of maintaining the population at or above 70% of the largest estimate to date, i.e., above 244,200. This objective could be achieved with harvests as high as 70,000 and 45,000 animals per year over a 3-year and 5-year period, respectively, given a harvest that was 50% young-of-the-year and 50% older animals, and assuming that mortality was distributed among ages, sexes and regions in proportion to relative abundance in the population (Table 4). This objective could also be achieved with harvests of 50% young-of-the-year and 50% older animals as high as 30,000 animals per year over a 20-year period.

Removals of 95% young-of-the-year and 5% older animals could achieve higher total harvest levels, up to 70,000 animals per year, and still meet the management objective over 20 years. This is possible because adult females have such long reproductive lives. However at the end of the 20-year period such high harvest levels would result in a population collapse.

Higher quotas could be sustained over shorter time periods, but for a long-lived species such as grey seal, more work is needed to determine if 20 years is a long enough time window to judge long-term sustainability.

Sources of Uncertainty

The Gulf herd breeds on small islands and on the pack ice in the Gulf of St. Lawrence. Considerable variability in pup production has been observed, particularly over the last decade and overall, estimates of pup production are likely conservative (Table 2). This may be related to changes in ice conditions, resulting in high pup mortality or the displacement of animals to other sites prior to completion of counts.

In poor ice years, the extended pupping season means that patches forming early in the season might be lost before being surveyed, as seen in 2010. Flights made following the 26 January storm indicated that the ice in the Strait was largely destroyed and that mortality among animals from the 24 January survey was likely to be high. Although mortality may not have been 100% since some animals may have drifted ashore, the absence of any significant number of older pups in any of the stage or transect surveys indicates that mortality was extensive. This would have resulted in the loss of up to 700 animals or about 16% of the animals born on the ice in 2010.

Additional sources of mortality for young of the year grey seals also include coyotes near islands such as Pictou and Saddle Island and predation from Bald Eagles in the area. Further analyses should consider ice cover as a covariate to help account for this variability.

New small colonies have appeared throughout the Gulf and along the coast of Nova Scotia including Hay Island (1993), Henry Island (1997), Oak Island (2007), Pictou Island (2007 assessment, but reports of some pupping since 1997), Kouchibouguac National Park (2007) and Anticosti Island (2007), Brion Island (2010) and Saddle Island (2010). The presence of pups at Anticosti Island is particularly surprising, since the Northern Gulf was thought to be too cold for pup survival.

With continued mild winters, however, expansion may be expected in areas where there is little human disturbance. Although surveyed and there are a number of suitable beaches are found along the south coast and on Miquelon, no pupping colonies have been observed in Newfoundland to date.

On Sable Island, a change in the duration of the age-specific stages was observed between data collected in 1997, 2007 and 2010. It is more difficult to collect these stage data for the non-Sable Island herd, so stage duration values were used from both the 1997 and 2007 experiments on Sable Island. The use of Sable Island estimates is not expected to result in significant bias.

Currently, harvesting is directed towards the coastal Nova Scotia and Gulf herds. The available reproductive data used in the model were collected from the Gulf herd only. Although large numbers of nuisance seal licences have been issued, there is incomplete reporting on removals under the nuisance seal permit program. Almost all of these licences have been issued in Nova Scotia.

The population model should be treated with some caution because: (1) the biological model showed clear lack of fit, particularly to the Gulf data where extending the model to account for ice and weather conditions would be useful; (2) sensitivity of the results to the priors used has not been assessed; and (3) the fitting algorithm may have caused some (small) biases.

The population projections are preliminary, and more discussion of potential harvest strategies and management goals are needed. Note also that the results are dependent on the adequacy of the population dynamics model used.

The nature and extent of density dependence in vital rates is poorly understood and may change over time. How density dependence acts on vital rates will have an impact on sustainable harvest scenarios

The uncertainty in population projections currently does not include sources of variability such as trends in the environment that may affect productivity.

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[1] In Newfoundland law requires that all seal pelt processing companies undertake full primary processing within the province, including the tanning of the hides. Seal pelts landed in Quebec and Nunavut are not subject to this law.