

**THE SUSTAINABLE MANAGEMENT
OF GREY SEAL POPULATIONS:
A PATH TOWARD THE RECOVERY
OF COD AND OTHER
GROUND FISH STOCKS**

*Report of the Standing Senate
Committee on Fisheries
and Oceans*

The Honourable Fabian Manning
Chair

The Honourable Elizabeth Hubley
Deputy Chair

October 2012

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ORDER OF REFERENCE

Extract from the Journals of the Senate, Thursday, October 20, 2011:

The Honourable Senator Manning moved, seconded by the Honourable Senator Smith (*Saurel*):

That the Standing Senate Committee on Fisheries and Oceans be authorized to examine and report on the management of the grey seal population off Canada's East Coast; and

That the committee report from time to time to the Senate but no later than June 30, 2012, and that the committee retain all powers necessary to publicize its findings until December 31, 2012.

The question being put on the motion, it was adopted.

Extract from the Journals of the Senate, Friday, June 22, 2012:

The Honourable Senator Manning moved, seconded by the Honourable Senator Ataullahjan:

That, notwithstanding the order of the Senate adopted on October 20, 2011, the date for the final report of the Standing Senate Committee on Fisheries and Oceans in relation to its study on the management of the grey seal population off Canada's East Coast be extended from June 30, 2012 to December 15, 2012.

The question being put on the motion, it was adopted.

Gary W. O'Brien

Clerk of the Senate

THE SUSTAINABLE MANAGEMENT OF GREY SEAL POPULATIONS: A PATH TOWARD THE RECOVERY OF COD AND OTHER GROUND FISH STOCKS

INTRODUCTION

Grey seals are believed to be an important factor limiting the recovery of Atlantic groundfish stocks since their collapse in the early 1990s. They are also viewed as a potential threat to other stocks, such as shellfish, which have replaced groundfish as the most important fishery resource on the East Coast. The total population of grey seals in eastern Canada increased from about 13,000 animals in 1960 to between 330,000 and 410,000 animals in 2010. In the southern Gulf of St. Lawrence, the grey seal population reached a record 104,000 animals during the same period.

In June 2009, answering calls for some type of control of the grey seal population, the Honourable Gail Shea, then Minister of Fisheries and Oceans, directed the Department of Fisheries and Oceans (DFO) "to ensure the targeted removal of grey seals that are preying on southern Gulf cod as part of its conservation approach."¹

In October 2010, DFO organized a five-day workshop in Halifax assembling 57 Canadian and international experts in the fields of marine mammals, marine fish, marine ecology and predatory-prey relations. These experts reviewed 31 scientific papers on topics such as grey seal pup production, diet, population estimates, fish population trends and distribution. In March 2011, as a follow-up to the workshop, the Canadian Science Advisory Secretariat (CSAS) advised that the weight of evidence suggested that grey seal predation in the southern Gulf of St. Lawrence was an important factor inhibiting the recovery of Atlantic cod and of other groundfish stocks, notably white hake and winter skate,² and that the number of grey seals feeding on cod would need to be reduced by 73,000 over five years to allow stocks to recover. An experiment was outlined to test this hypothesis.³

In September 2011, the Fisheries Resource Conservation Council (FRCC) recommended that DFO proceed "immediately on an experimental reduction of grey seals in the southern Gulf of St. Lawrence to maintain the number of seals foraging in that area at

¹ Department of Fisheries and Oceans, "[2009 Gulf of St. Lawrence Fisheries Management Decisions](#)," Backgrounder, 16 June 2009.

² White hake and winter skate and are two species considered at high risk of extirpation in the southern Gulf.

³ Department of Fisheries and Oceans, Canadian Science Advisory Secretariat, [Impacts of Grey Seals on Fish Populations in Eastern Canada](#), Science Advisory Report 2010/071, March 2011.

less than 31,000 animals, and that comprehensive monitoring of the effect on groundfish and ecosystem parameters be continued for a time sufficient to definitively test the effect on groundfish population processes and parameters in that area.”⁴

The following month, in October 2011, the House of Commons Standing Committee on Fisheries and Oceans recommended that “the Department of Fisheries and Oceans immediately put into place a plan, based on scientific evidence, to mitigate the impact of the rapidly growing population of grey seals on the snow crab resource in the Gulf of St. Lawrence, including the targeted removal of grey seals.”⁵

Following these events, the Standing Senate Committee on Fisheries and Oceans (“the Committee”) was authorized in late October 2011 to “examine and report on the management of the grey seal population off Canada’s East Coast”.⁶ In particular, the Committee endeavoured to investigate the impacts grey seals are having on cod stock recovery, and recommend options to address the problem, including the possibility of a targeted removal of grey seals in some areas where they aggregate.

The Committee started its hearings in October 2011 in Ottawa, and finished in Halifax for a full day of meetings on 29 March 2012. In total, the Committee heard from more than 40 witnesses and received many briefs. Witnesses included the following:

- Government, university and independent scientists;
- Federal government officials from both DFO and the Department of Foreign affairs and International trade (DFAIT);
- Representatives from provincial governments;
- Representatives from animal welfare organisations;
- Representatives from environmental groups;
- Fishermen, harvesters and processors;
- Representatives from coastal communities; and
- Representatives from First Nations.

⁴ Fisheries Resource Conservation Council, [Towards Recovered and Sustainable Groundfish Fisheries in Eastern Canada](#), September 2011, p. 35.

⁵ House of Commons, Standing Committee on Fisheries and Oceans, [Report on the Snow Crab Industry in the Atlantic Provinces and in Quebec](#), October 2011, p. 3.

⁶ Extract from the Journals of the Senate, Thursday, October 20, 2011.

This report provides a review of the evidence heard by the Committee and recommends actions for the federal government.

GREY SEAL BIOLOGY

Six species of seals – harp, hooded, ringed, bearded, harbour and grey – are found off Canada’s Atlantic coast.⁷ Of the six, harp seals are the most abundant species and have accounted for almost all of the seals harvested commercially.

In Canada, the grey seal (*Halichoerus grypus*) forms a single population that is subdivided for management purposes. Three herds are named based on the location of concentrations of breeding animals: the Gulf of St. Lawrence herd; the coastal Nova Scotia herd; and the Sable Island herd (Figure 1).

Adult male grey seals can grow to more than 2.3 metres (7.5 ft) long and weigh up to 400 kg (880 lbs), whereas females grow to 1.8 metres (5.9 ft) long and up to 250 kg (550 lbs). Grey seals are the longest lived pinniped,⁸ with females living as long as 45 years.⁹ Female grey seals usually have their first pup when they reach four years of age, but evidence from Sable Island shows that age of first birth (primiparity) has shifted from four years to six years.¹⁰

Sable Island is the largest rookery, where four out of five pups are born. Fifteen per cent of pups are born in the southern Gulf of St. Lawrence, and 4 per cent in coastal Nova Scotia, mainly on Hay Island. Pups are born in January. Seals may move between rookeries, but tend to return to the same breeding sites year after year.¹¹

⁷ Department of Fisheries and Oceans, [2011–2015 Integrated Fisheries Management Plan for Atlantic Seals](#).

⁸ Pinnipeds include all seals, sea lions and the walrus.

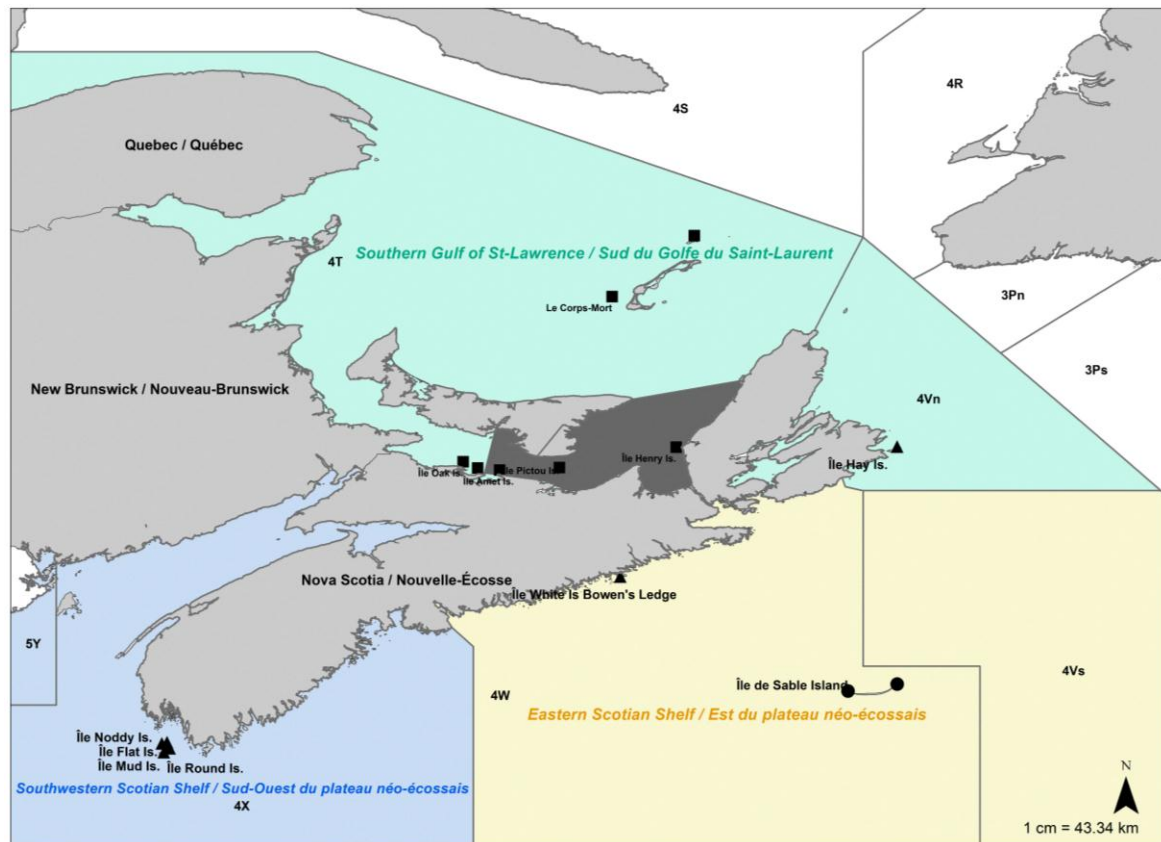
⁹ Department of Fisheries and Oceans, [Grey Seal](#).

¹⁰ W. D. Bowen, J. I. McMillan and W. Blanchard, “Reduced Population Growth Of Gray Seals At Sable Island: Evidence From Pup Production And Age Of Primiparity,” *Marine Mammal Science*, Vol. 23, No. 1, 2007, pp. 48–64.

¹¹ W. D. Bowen, J. McMillan and R. Mohn, “Sustained exponential population growth of grey seals at Sable Island, Nova Scotia,” *ICES Journal of Marine Science*, Vol. 60, 2003, pp.1265-1274.

Grey seals are predators, eating many species of fish and invertebrates. These pinnipeds will change their diet based on prey abundance, and will visit different feeding areas during the course of the year.¹² This movement leads to an overlap in the different herds outside of the breeding season.¹³ Seals compensate for mortality through increased pup production.¹⁴

Figure 1 – Main grey seal rookeries and NAFO Management Areas in Eastern Canada



Source: Department of Fisheries and Oceans, Canadian Science Advisory Secretariat, *Stock assessment of Northwest Atlantic grey seals (Halichoerus grypus)*. Science Advisory Report 2010/091, 2011; and Northwest Atlantic Fisheries Organization, NAFO Subarea 4, <http://www.nafo.int/about/frames/about.html>. The map was prepared by Emmanuel Prévile, Library of Parliament.

The grey seal colonies are identified as Sable Island (●), Eastern Shore (▲), Gulf (■) and the ice-breeding areas are shaded dark grey. Three areas discussed in this report are identified as the Southern Gulf of St. Lawrence (NAFO management area 4TVn), the Eastern Scotian Shelf (NAFO management area 4VsW), and the Southwestern Scotian Shelf (NAFO management area 4X).

¹² Bowen, McMillan and Blanchard (2007).

¹³ Department of Fisheries and Oceans (2011).

¹⁴ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 0900 (Boris Worm, Associate Professor, Department of Biology, Dalhousie University).

GREY SEAL POPULATION GROWTH

Little is known about the historical abundance of grey seals. In the 1960s, the population in eastern Canada was 13,000 animals. By 2010, this figure had reached between 330,000 and 410,000 animals (Figure 2).¹⁵ The magnitude of this population increase is viewed in some circles “as a Canadian conservation success story.”¹⁶ Other views are that the population was allowed to increase in large part because of the lack of predation on the species, and in the absence of a formal conservation or management plan.

On Sable Island, the first quantitative estimates of the grey seal population were of several hundred individuals in the mid-1800s. Today, Sable Island has the largest herd in eastern Canada.¹⁷ Its rate of increase was 12.8 per cent during the 1980s, but it has since slowed to about 4 per cent in the last five years.¹⁸ In 2010, total pup production was approximately 76,300 animals.

Grey seal populations are estimated using statistical modelling that is based on visual surveys of pupping areas, harvest information, and pregnancy rates.¹⁹ Estimating the total population is challenging, given that the animals are dispersed marine mammals, who spend much of their time in the sea.²⁰

Factors leading to the growth of the grey seal population over the last 50 years are not well understood, but include an improvement in breeding conditions, a reduction in hunting, and the absence of natural predators.²¹

¹⁵ Department of Fisheries and Oceans (2011).

¹⁶ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. David M. Lavigne, Science Advisor, International Fund for Animal Welfare).

¹⁷ Department of Fisheries and Oceans (2011).

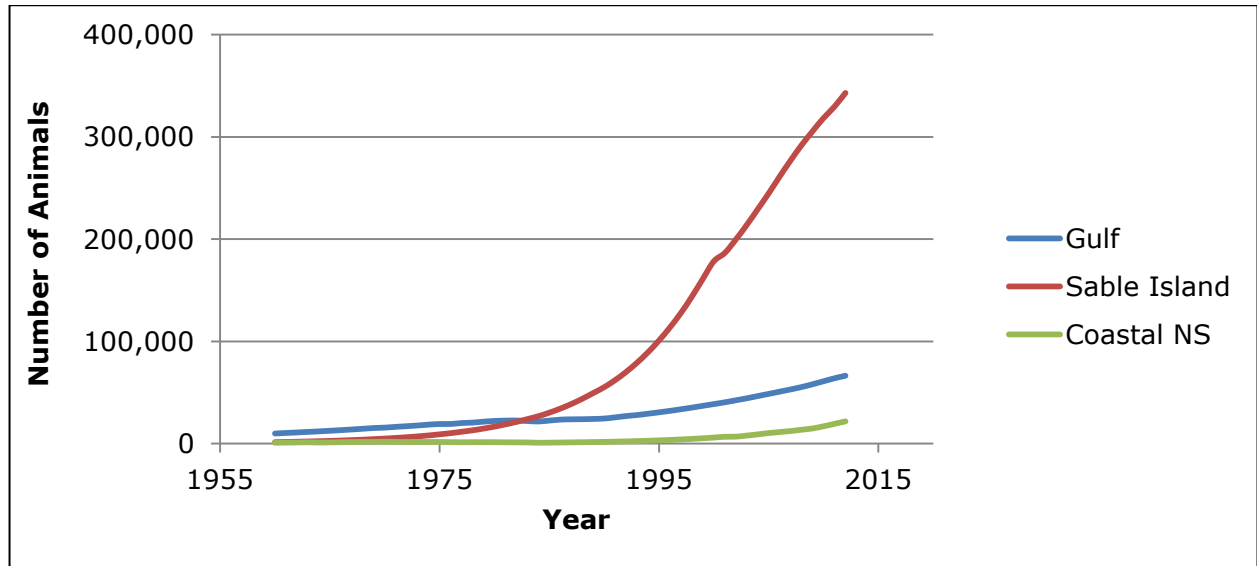
¹⁸ Ibid.

¹⁹ L. Thomas, M. O. Hammill and W. D. Bowen, [*Estimated size of the Northwest Atlantic grey seal population 1977-2007*](#), Department of Fisheries and Oceans, Canadian Science Advisory Secretariat, Research Document 2007/082, 2008, 31 p.

²⁰ Ibid.

²¹ Department of Fisheries and Oceans (2011).

Figure 2 – Population growth of the three grey seal herds in Eastern Canada, 1960–2012



Source: data obtained from the Department of Fisheries and Oceans, 25 April 2012.

HARVESTING SEALS

Seals have been managed using the precautionary approach²² since 2003. For grey seals, the current precautionary management objective is to maintain an 80% probability that the population will remain above the Precautionary Reference Point which has been set at 70% of the largest population seen (N70). The current population estimate being approximately 400,000 animals, the management objective under the current management plan would be to maintain the population above 280,000 animals.²³ According to DFO, the appropriateness of the use of the N70 level is being examined for the purposes of the current seal management plan.²⁴ The Committee notes that because of the upward trend in the grey seal population and the way the Precautionary Reference

²² Department of Fisheries and Oceans, [A Fishery Decision-Making Framework Incorporating the Precautionary Approach](#); and, Department of Fisheries and Oceans, [2011-2015 Integrated Fisheries Management Plan for Atlantic Seals](#).

²³ M.O. Hammill and D. Swain, [A Controlled Experiment \(Strawman draft\) to Test the Impact of Removals of Grey Seals on the Mortality of Southern Gulf Cod](#), Department of Fisheries and Oceans, Canadian Science Advisory Secretariat, Research Document 2011/013, 2011, 12 p.

²⁴ Department of Fisheries and Oceans, [2011-2015 Integrated Fisheries Management Plan for Atlantic Seals](#).

Point is currently set, the management objective is a moving target. Therefore, the Committee supports such a review.

For 2012, DFO has set the Total Allowable Catch (TAC) of grey seals on the East Coast at 60,000 animals. This TAC is established using considerations such as the abundance of the population, the threshold of the safe zone dictated by the department's precautionary approach framework, and input from the industry.²⁵

This number represents the amount of animals that could be harvested within the boundaries of what the grey seal population could sustain. Given the fact that there has never been a well developed and viable market for grey seals, there is little incentive for harvesters to reach this TAC.

In 2011, approximately 200 grey seals were harvested from a TAC set by DFO at 60,000 animals (Table 1). There are 49 professional grey seal harvesters in DFO's Gulf Region, and 130 in the Maritimes Region. The last significant commercial fishery was in 2008 on Hay Island, when 1,261 grey seals were taken by 16 participants over three days of hunting in February.

Table 1 – Grey Seal Total Allowable Catches (TACs) and Harvests, 2007–2011

Year	TAC	Harvest (# of animals)
2007	9,000	893
2008	12,000	1,472
2009	50,000	254
2010	50,000	7
2011	60,000	195

Source: Department of Fisheries and Oceans, Brief submitted to the Committee, 25 October 2011.

²⁵ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 0900 (Morley Knight, Director General, Resource Management, Department of Fisheries and Oceans).

The population of grey seals is large enough to sustain a hunt.²⁶ Past hunts have targeted juvenile seals for blubber oil and pelts, although difficult access and undeveloped markets have kept the hunt at very low levels. The controversy of the past 30 years surrounding the Canadian seal hunt has no doubt contributed to the lack of development of markets for grey seal derived products.

IMPACT ON OTHER MARINE SPECIES

Grey seals are generalist predators, eating many species of fish and invertebrates, and will change their diet based on the availability of prey.²⁷ Grey seal diet information is obtained by analyzing feces, stomach content and fatty acids, and reveals that:

- Grey seals eat mainly fatty fish like sand lance, herring, capelin and redfish²⁸ as well as cod, skate and small aquatic organisms;²⁹
- An adult seal will eat between 1.5 and 2 tonnes of fish per year.³⁰

Seals have other adverse effects on species they prey upon, including competition for food, transmission of parasites, disruption of spawning causing reduced reproductive success, and other effects caused by changes in the prey behaviour to reduce the risk of predation. Infection by larval sealworm was particularly worrisome for many witnesses. It does not impair the fitness of fish, but does have an effect on its processing cost and its marketability.³¹

Grey seals, like other large marine mammals, may also have positive effects on the ecosystem in which they live. For example, whales have been shown to enhance the

²⁶ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 March 2012, 0900 (Heike K. Lotze, Associate Professor and Canada Research Chair in Marine Renewable Resources, Department of Biology, Dalhousie University).

²⁷ Bowen, McMillan and Blanchard (2007).

²⁸ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 0900 (Sara Iverson, Professor, Department of Biology, Dalhousie University).

²⁹ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 25 October 2011, 1700 (Siddika Mithani, Assistant Deputy Minister, Ecosystems and Oceans Science Sector, Department of Fisheries and Oceans).

³⁰ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Robert O'Boyle, Scientist, as an individual).

³¹ Department of Fisheries and Oceans (2011).

primary productivity in their feeding areas through the cycling of nutrients.³² In addition, the physical movement of animals through the water column makes a significant contribution to biogenic mixing of ocean layers.³³ In the Southern Ocean, recent research suggests that baleen whales play an important role in maintaining primary productivity through the storage and recycling of micronutrients; thus greater numbers of top predators support larger populations of food species.³⁴

TOWARD RECOVERY OF DEPLETED FISH STOCKS

The undisputed facts heard during this study are that the grey seal population on the East Coast of Canada has increased 30-fold in the last 50 years, and that, over the latter portion of this period, the abundance of many economically significant groundfish stocks has declined rapidly to unprecedented lows.

There are many factors that contributed to depletion of groundfish stocks, the predominant one being overfishing. Despite significant decrease in fishing mortality due to moratoria or reduced harvesting, many species such as Atlantic cod, American plaice, winter skate, and white hake have shown little or no recovery.

Marine scientists believe that this lack of recovery is in large part due to high natural mortality for the depleted species. High natural mortality may be explained by predation, unfavourable marine conditions, and limited access to prey.

Having heard numerous witnesses, the Committee is convinced that predation on groundfish by seals, whether harp or grey, has been an important cause of the observed high level of natural mortality.

³² J. Roman, and J. J. McCarthy, "The Whale Pump: Marine Mammals Enhance Primary Productivity in a Coastal Basin," *PLoS ONE*, Vol. 5, No. 10, 2010, p. e13255.

³³ K. Kakani, "Review: Biogenic inputs to ocean mixing," *The Journal of Experimental Biology*, Vol. 215, 2012, pp. 1040-1049.

³⁴ S. Nicol, A. Bowie, S. Jarman, D. Lannuzel, K. M Meiners and P. van der Merwe, "Southern Ocean iron fertilization by baleen whales and Antarctic krill," *Fish and Fisheries*, Vol. 11, 2010, pp. 203-209.

I spent nearly 30 years auto-trawling by dragging a net on the bottom for flounders in the Northumberland Strait. Back about 10 years ago, as the seal herd was increasing, all types of flounder – yellowtail, black back, American plaice, grey sole, started to disappear.³⁵

*Mr. Ronnie Heighton, Board Member,
Eastern Fishermen's Federation*

Of the depleted fish species on the East Coast of Canada, Atlantic cod is the most significant on more than one level. Its demise and the ensuing moratoria had and continue to have to this day impacts on hundreds of coastal communities. Currently, cod populations are at historic lows despite 20 years of severely curtailed fishing activities. All cod stocks in the northern and southern Gulf of St. Lawrence and on the eastern and western Scotian Shelf have decreased significantly. The stocks are so low that they have been assessed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)³⁶ (Table 2).

Table 2 – Status of Cod Stocks, Gulf of St. Lawrence and Scotian Shelf

	Northern Gulf	Southern Gulf	Eastern Scotian Shelf	Western Scotian Shelf
TAC (in tonnes)	2,000	Moratorium	Moratorium	1,650
Current Biomass ³⁷ (in tonnes)	16,000	28,000	57,500	9,000
Limit Reference Point ³⁸ (in tonnes)	116,000	80,000	50,000	24,000
COSEWIC Status (2010)	Endangered	Endangered	Endangered	Endangered

Source: Department of Fisheries and Oceans, Brief submitted to the Committee, 25 October 2011.

³⁵ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 March 2012, 0900 (Ronnie Heighton, Board Member, Eastern Fishermen's Federation).

³⁶ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 25 October 2011, 1700 (Siddika Mithani, Assistant Deputy Minister, Ecosystems and Oceans Science Sector, Department of Fisheries and Oceans).

³⁷ Biomass is defined as the total weight of a fish species in a given area.

³⁸ Limit reference point is defined as the population level below which there is a high probability that its productivity will be so impaired that serious harm will occur. The limit reference point is established based on the best available scientific information.

Over the past 60 years the historical ecosystem balance has been disturbed by fishing power, high seas fishing, and failed resource management regimes. We need to move now towards a balanced, informed and carefully managed approach to marine resource utilization.³⁹

*Hon. Darin King, MHA, Minister of Fisheries
and Aquaculture of Newfoundland and Labrador*

Human pressure on cod has caused dramatic changes in abundance, productivity and size at maturity. Other pressures on cod may include parasites, emigration, disease, contaminants, poor fish condition, life history change, and predation.⁴⁰ Grey seals are a predator of cod, and there is evidence to show that:

- High natural cod mortality and grey seal abundance are positively correlated, which means that in areas where cod mortality is high, grey seal abundance is also high.⁴¹ Anecdotal evidence has shown that there are more interactions between cod fishermen and grey seals, in particular belly-biting of caught cod by seals.⁴² Although low cod survival and a large seal population are occurring together, this does not necessarily indicate that one is the cause of the other.
- Cod represents between 1 and 24 per cent of the diet of grey seals.⁴³ The proportion of cod in grey seal stomachs depends on the age, size and sex of the seal, as well as the time of year, the area where the seal is feeding and the testing method used.⁴⁴ For example, male seals eat more cod than female seals do, and seals eat more cod in the winter than in the summer. In the Southern Gulf of St. Lawrence, male grey seals preferentially eat big cod over small cod⁴⁵.

³⁹ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 19 March 2012, 0900 (Hon. Darin King, MHA, Minister of Fisheries and Aquaculture of Newfoundland and Labrador).

⁴⁰ Department of Fisheries and Oceans (2011).

⁴¹ Ibid.

⁴² Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 March 2012, 0900 (Wilford D. Smith, Board Member, Eastern Fishermen's Federation).

⁴³ Department of Fisheries and Oceans (2011).

⁴⁴ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 25 October 2011, 1700 (Siddika Mithani, Assistant Deputy Minister, Ecosystems and Oceans Science Sector, Department of Fisheries and Oceans).

⁴⁵ Department of Fisheries and Oceans (2011).

Scientists determine the diet of seals using a variety of methods, including analysis of feces, contents of stomach and intestines, and fatty acid signatures in seal blubber. The examination of feces, stomach contents and intestines uses the bony remnants of prey to determine what a landed seal has eaten over the past few meals, while quantitative fatty acid signature analysis (QFASA) reveals characteristic chemical profiles of marine species in a seal's diet over weeks or months.⁴⁶ These analyses result in a wide range of values for the percentage of cod in the diet of grey seals. The CSAS reports an average of 1-7 percent for the Eastern Scotian Shelf and between 1 percent (females in summer) and 24 percent (males in winter) for the southern Gulf of St. Lawrence.⁴⁷ Gaps in the sampling of seal diets makes it difficult to draw firm conclusions about the proportion of cod mortality that is caused by grey seal predation throughout the year over all regions.

The Committee acknowledges that there is still debate on the exact nature of the grey seal diet, particularly the proportion of the diet contributed by depleted fish species such as cod. There have been also doubts expressed as to the effect that a reduced grey seal population would have on the recovery of depleted fish species, and in particular cod. Many witnesses referred to the complexity of marine ecosystem and the marine food web to argue this point of view.

One witness, Dr. Jeffrey Hutchings from Dalhousie University admitted that ultimately, there would not be "a clear scientific answer to the question of how cod will respond to a cull of grey seals."⁴⁸ He added:

From a science perspective, science is reaching the limits of what it can confidently and credibly predict would result from a cull of grey seals. Ultimately, the decision whether or not to do it [...] will not be a science one but will have to be based on something else.⁴⁹

Further to that, Ms. Susanna Fuller of the Ecology Action Centre stated:

⁴⁶ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 0900 (Sara Iverson, Professor, Department of Biology, Dalhousie University).

⁴⁷ Department of Fisheries and Oceans (2011).

⁴⁸ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. Jeffrey Hutchings, Professor of the Department of Biology, Dalhousie University).

⁴⁹ Ibid.

Science makes mistakes sometimes and sometimes cannot predict things, but science can tell you when it cannot predict things. That is where the management decision comes in around precaution and uncertainty.⁵⁰

The Committee believes that scientific uncertainty should not be stopping DFO from taking action. A wait and see approach would be insufficient to allow the recovery of many of the groundfish stocks.

A. Recovery Plans for Depleted Fish Stocks

Options to address the impact of the large grey seal population on the recovery of cod and other groundfish stocks were discussed during the Committee's hearings. The principal one was the recommendation of DFO scientists and resource managers, the FRCC as well as fishermen's groups, to proceed with the harvest of grey seals in the southern Gulf of St. Lawrence.

The Committee believes that this option or any other options that would deal with the management of grey seal population in other areas of Atlantic Canada have to be implemented within a broader strategy centered on the development and the implementation of recovery plans for Atlantic cod and other depleted fish stocks.

Speaking of the lack of progress of Canada with respect to national and international commitments to sustain marine biodiversity, Dr. Jeffrey Hutchings, from Dalhousie University, said the following:

One of these key deficiencies is reflected by the absence of recovery plans, recovery targets, conservation limits and recovery harvest rules for depleted species, contrary to Canada's obligations to do so. In my view, a cull of grey seals in the southern gulf could potentially be deemed defensible if the following four points were addressed: first, if it was formally acknowledged that the heightened extinction risks faced by marine fishes in the southern gulf were produced by human-induced overfishing and predicated by political expediency; second, if appropriate recovery plans existed for currently and previously exploited fishes in the southern Gulf of St. Lawrence, which currently do not exist; third, if additional scientific analysis supports the hypothesis that predation by grey seals on adult cod is higher than previously believed; and fourth, if the cull was deemed to be

⁵⁰ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Susanna Fuller, Marine Conservation Coordinator, Ecology Action Centre).

the only possible action that could be taken to prevent the extirpation or loss of endangered marine fishes in the southern gulf.⁵¹

The Committee noted the consequences of the deficiencies identified by the witness. The cod stock status data provided by DFO and shown in Table 2 illustrate the inconsistency in managing this species across regions. Indeed, a fishery is allowed in a situation where the biomass is well below the conservation limit (Limit Reference Point), and a moratorium is in place in the reverse situation.

According to Dr. Hutchings, without recovery targets or timelines for recovery, it is impossible to determine whether a management action such as the proposed targeted removal of grey seals in the southern Gulf of St. Lawrence "is consistent with the objective of achieving a particular target within a predefined recovery period."⁵² Furthermore, "in absence of reference points or control rules, there is no means of being able to audit the effectiveness or to track the record of fisheries management decision."⁵³ In their February 2012 report, the members of the Royal Society of Canada's Expert Panel on Sustaining Canadian Marine Biodiversity chaired by Dr. Hutchings, discussed this issue in depth and agreed with these conclusions.⁵⁴

According to the FRCC, DFO has nevertheless in recent years "accelerated the preparation of harvest strategy frameworks, and recovery plans for stocks that require them."⁵⁵ There is however still a lot of work to do, and in Dr. Hutchings' words:

We could do it tomorrow. The job would be for Fisheries and Oceans scientists. Indeed, Fisheries and Oceans scientists have been working for at least 10 years in anticipation of the requirement for incorporating the precautionary approach to identify what these target limit and reference points would be. The methodology for doing so has existed for quite some time. The United States, Australia, New Zealand, South Africa, Norway and parts of Europe are already using a fairly agreed-upon method for identifying these reference points. Limit reference points

⁵¹ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. Jeffrey Hutchings, Professor of the Department of Biology, Dalhousie University).

⁵² Ibid.

⁵³ Ibid.

⁵⁴ J.A. Hutchings et al., [*Sustaining Canadian Marine Biodiversity: Responding to the Challenges Posed by Climate Change, Fisheries and Aquaculture*](#), Expert Panel Report prepared for the Royal Society of Canada, Ottawa, February 2012.

⁵⁵ Fisheries Resource Conservation Council (2011).

have just been identified or quantified for cod but target reference points have not. It is part of the sustainable fisheries framework of DFO to do this; but it has not yet been done. The methodology for doing so exists, and it has been practised in other countries. The people who would do it would be stock assessment scientists within DFO.⁵⁶

The Committee therefore recommends:

Recommendation 1

That the Department of Fisheries and Oceans continue to identify recovery targets and timelines, and limit reference points in accordance with the existing precautionary approach framework, for all depleted fish stocks, starting in the southern Gulf of St. Lawrence.

B. Funding the Scientific Research Gaps

Writing to the Committee about the management of the grey seal population on the East Coast of Canada, Dr. Bruce Hatcher, Professor of Biology at Cape Breton University, stated the following:

The scientific controversy is complex, hinging on indirect evidence from fish health, seal diets and numerical models of populations, food webs and ecosystems. Observations of fishermen and seal hunters augment the evidence with extensive, local, ecological knowledge.⁵⁷

Much remains to be learned about the interactions of seal and cod and other elements in the marine ecosystems in which they live. The Committee heard from several witnesses that critical information is lacking in several areas, including:

- Grey seal predation as a component of the high natural mortality for eastern Scotia Shelf cod;
- Current survey information on winter distribution of cod and other fish species;
- A clear and generally accepted figure for the percentage of cod in the seal diet along with estimates of cod consumption, particularly for large cod;
- Energy requirements of grey seals;

⁵⁶ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. Jeffrey Hutchings, Professor of the Department of Biology, Dalhousie University).

⁵⁷ Dan Lane and Bruce Hatcher, Letter to the Standing Senate Committee on Fisheries and Oceans (Re: Presentation to the Standing Senate Committee on Fisheries and Oceans), 3 April 2012.

- Range of seals foraging on the eastern Scotian Shelf;
- Response of predator and prey populations to culls, and the effectiveness of culls in the marine environment;
- Multi-species impacts of a reduction in the seal population;
- Ecosystem services provided by seals;
- Role of sharks and whales in juvenile seal mortality;
- Impact and efficiency of experimental seal exclusion zones such as on and around Hay Island;
- Alternate means of seal population control, specifically the use, the efficiency and the logistics of contraceptive methods;
- Transmission of parasites from seal to cod;
- Determination of population reference levels for all relevant fish species; and,
- Marine species interactions, recruitment, growth and mortality.

The Committee therefore recommends:

Recommendation 2

That the Department of Fisheries and Oceans coordinate and participate in a scientific research agenda to address the knowledge gaps identified by witnesses during this study, in order to address unique situations such as those that prevails on Sable Island and Hay Island. These gaps include the percentage of cod in the seal diet, the seals' range on the Eastern Scotian Shelf, and the application of alternative management methods.

C. Harvest of Grey Seals in the Southern Gulf of St. Lawrence

In the southern Gulf of St. Lawrence (NAFO management area 4TVn), the population of cod remains well below the conservation limit reference point of 80,000 tonnes. The directed fishery for cod was closed in 1993, reopened for 1998, closed again for 2003, opened between 2004 and 2008, and has since been closed. This cod population will be extirpated from the southern gulf by 2050 if current high mortality continues.⁵⁸

⁵⁸ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. Jeffrey Hutchings, Professor of the Department of Biology, Dalhousie University).

Instead of having cod being allowed to recover in the absence of fishing, we had cod basically kept at a very low level because of these fisheries. Even though they were described as small-scale fisheries, they were small in the sense that the absolute amount of cod was relatively low, but they were high in terms of the percentage of what was available to be taken.⁵⁹

*Dr. Jeffrey Hutchings,
Professor of the Department of Biology, Dalhousie University*

Grey seal predation contributes to natural mortality of 4T cod, winter skate and white hake. Grey seals are considered a significant source but not the only source of unsustainable high mortality of some fish in the southern gulf.⁶⁰

To allow cod stocks to recover, the FRCC and CSAS recommend a targeted removal of grey seals in 4T.⁶¹ By their estimates, the number of grey seals feeding on cod would need to be reduced by 73,000 from the current 104,000 animals. Both of these organizations concluded that for the Gulf of St. Lawrence alone is there evidence to show that a decrease in the seal population could assist cod recovery.⁶²

The Committee is persuaded by the demonstration that seal predation is preventing the recovery of groundfish stocks in the southern Gulf of St. Lawrence. While acknowledging the ecological risks raised by some witnesses, the Committee supports the logic of the proposed experimental reduction of grey seals in this area. According to the FRCC, the recommended action is consistent with adaptive management, an approach to fisheries management which “deals with uncertainty in decision-making by undertaking management “experiments” carefully designed and monitored to determine what “works””.⁶³

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Fisheries Resource Conservation Council (2011); and, Hammill and Swain (2011).

⁶² Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 25 October 2011, 1700 (Siddika Mithani, Assistant Deputy Minister, Ecosystems and Oceans Science Sector, Department of Fisheries and Oceans).

⁶³ Fisheries Resource Conservation Council (2011), p. 34.

Proponents of the targeted removal argue that it will not only reduce adult cod mortality, but will also provide an opportunity to improve ecosystem modelling and evaluate the effectiveness of culling marine mammals.⁶⁴

The Committee thus believes that the Department should proceed with developing cost-effective program options for a grey seal harvest to prevent the extirpation of cod from the southern Gulf of St. Lawrence as soon as possible to test the hypothesis that predation by grey seals is the major factor preventing recovery of groundfish stocks in that area.

For 2012, DFO has set the TAC of grey seals on the East Coast at 60,000 animals. This number represents the amount of animals that could be harvested within the boundaries of what the grey seal population could sustain, and is consistent with the precautionary approach framework as applied to the management of grey seal.

Both DFO scientists and the FRCC advised that the number of grey seals foraging in the southern Gulf of St. Lawrence would have to be reduced by 70% (or 73,000), to approximately 31,000 animals, in order to reduce the natural mortality of cod to a level sufficiently low to allow for a measureable increase in the cod stock in that area.⁶⁵ This targeted removal would be within the acceptable range of a precautionary management objective of not allowing the whole grey seal population on the East Coast to fall below 70% of the largest population seen, or to be reduced by more than 120,000 animals.

⁶⁴ Fisheries Resource Conservation Council (2011).

⁶⁵ Department of Fisheries and Oceans (2011).

The Committee therefore recommends:

Recommendation 3

That starting with the 2013 season and for a period of four years, the Department of Fisheries and Oceans implement and manage a grey seal targeted removal program in the southern Gulf of St. Lawrence to reduce the level of the herd by 70,000 animals; and, that this program, based on the Fisheries Resource Conservation Council's report entitled "Towards Recovered and Sustainable Groundfish Fisheries in Eastern Canada", work in conjunction with continuing research and evaluation which should lead to a long term sustainable management plan of grey seals in Atlantic Canada and Quebec;

That research protocols to be performed during the removal of grey seals be established to test the hypothesis that predation is the major factor preventing recovery of groundfish stocks in the southern Gulf of St. Lawrence, as well as to better understand and monitor the effects of the targeted removal; and,

That Department of Fisheries and Oceans officials appear before the Standing Senate Committee on Fisheries and Oceans at the earliest opportunity after the first harvesting season to report on the progress made with the grey seal targeted removal program.

The Committee would however like to see conditions met in four areas for the harvest to take place. These conditions deal with monitoring, harvesting practices, training of harvesters, and financial compensation for harvesters.

Conditions of the grey seal harvest would be framed by federal legislation which prohibits the wilful neglect or infliction of pain or injury of an animal under the *Criminal Code of Canada*.⁶⁶

The conditions and operational design of a proposed harvest are essential elements in ensuring that people involved in the operation are working safely and meeting the ethical obligations described above, including the manner in which each grey seal is killed. There are adequate end-of-life considerations for marine mammals under the *Marine Mammal Regulations of the Fisheries Act*.

⁶⁶ Canadian Food Inspection Agency, [Animal Welfare in Canada](#).

It is therefore imperative that the current and humanely verified process, known as the “three step humane” process for harvesting harp seals be applied to killing grey seals. This process, described by the following steps: (1) stun; (2) check; (3) bleed, has been verified by an Independent Veterinarians Working Group. It is mandated by the *Marine Mammal Regulations* and consistent with animal welfare provisions in the *Criminal Code of Canada* and other federal statutes.

To proceed, DFO officials told the Committee that one option considered at a meeting in Halifax in February 2012 was that seal harvesters could target animals in areas where seals are congregated in large numbers. The harvest would be monitored by at-sea observers to ensure the use of humane practices.

The Department also told the Committee that financial incentive would be provided to the harvesters after verification of the actual number of animals dispatched. At this time, the Committee understands that the level of this incentive is not yet determined, but a firm has been contracted by DFO to perform an economic analysis of the proposed activities.

Recommendation 4

That the harvest of grey seals be performed by qualified and trained seal harvesters under the monitoring of at-sea observers in a manner respectful of established humane harvesting protocols; and,

That adequate and fair compensation, the level of which yet to be determined, be provided to seal harvesters for each dispatched animal.

D. Sustainable Management of the Grey Seal Population, Harvest, Markets and Promotion

The Committee strongly believes that, for the purpose of population management, harvesting grey seals in a context of an existing market for derived products is far preferable to a targeted removal or cull. In its 2011 report, the FRCC stated:

The Council recognizes that an effective sealing industry will take several years to rebuild. In the short term of the initial experiment, large numbers of seals must be killed even in the absence of commercial gain. The respectful course of action is to use this as an opportunity to develop harvest methods and commercial products as rapidly as possible.⁶⁷

It is therefore important that at the same time that DFO put in place and proceed with the harvest of grey seals in the southern Gulf of St. Lawrence, that the department develop a broad, long-term, sustainable plan for the management of this resource. This plan should be based on viable domestic and international markets for grey seal-derived products. The full utilization of the harvested animal should be the overarching principle in this context.

The Committee received evidence from representatives of the Canadian Fisheries, Oceans and Aquaculture Management (C-FOAM) at the Telfer School of Management of the University of Ottawa, pertaining to a business case for a commercial grey seals fishery on Hay Island. Hay Island is located off Cape Breton in the Scaterie Island Wilderness Area, and is one of the rookeries used by grey seals on the East Coast of Canada. In 2011, DFO estimated that roughly 2,500 pups were born at that location.

The plan drafted by C-FOAM representatives included:

- Developing a value-added sustainable grey seals harvest over a period of 5 years;
- Developing local expertise in harvesting and processing juvenile and adult grey seals in an ethical and humane fashion;
- Developing and maintaining secure markets for product deliverables and committing to research into product and market development striving for full utilization of harvested animals;
- Involving trained and licensed grey seal harvesters and partners from the Aboriginal community under the auspices of the regional DFO Fisheries and Aquaculture Management sector for restricted annual access to the harvest area;
- Using harvesters, under the direction of DFO Science, as data gatherers and observers toward the accumulation of scientific information; and,
- Disclosing harvest and processing information for auditing and control purposes through consultation with local community residents, provincial and federal governments, and the ENGO community.⁶⁸

⁶⁷ Department of Fisheries and Oceans (2011), p.36.

⁶⁸ Dan Lane and Bruce Hatcher (2012).

The plan also committed to developing and promoting the marketing of grey seal-derived products in domestic and international markets, especially in China where the Government of Canada has recently multiplied efforts in that respect. The C-FOAM plan also listed a full suite of grey seal-derived products that would ensure the full utilization of the harvested animals. These included food products (meat, protein mix, pet food), nutraceuticals such as seal oil rich in omega-3 fatty acids, health products such as collagen, and other commercial products (furs, pelts, flippers, paint, leather, waterproof clothing).⁶⁹

This proposal was consistent with the testimony of other witnesses such as representatives of the Government of Newfoundland and Labrador and representatives of the seal industry. The Committee was particularly interested by the testimony of Chief Roy Jones Jr., who stressed the numerous health benefits of seal oil, particularly for cardiovascular health. Seal oil is uniquely rich in omega-3 essential fatty acids such as docosapentaenoic acid or DPA.

The Committee supports wholeheartedly proposals such as the one presented by the C-FOAM representatives.

The Committee therefore recommends:

Recommendation 5

That the Department of Fisheries and Oceans support a long term sustainable grey seal harvest on the East Coast of Canada by:

- **Auditing all sealing activities ensuring that all protocols, humane and ethical harvest practices, and general "best practices" in management are being adhered to;**
- **Playing a role of primary scientific advisor to the industry; and,**

That the Government of Canada and its agencies promote grey seal-derived products and develop domestic and international markets for them.

⁶⁹ Dan Lane and Bruce Hatcher (2012).

More specifically with respect to the health benefits of omega-3 fatty acid-rich seal oil, the Committee recommends:

Recommendation 6

That the Government of Canada (Health Canada) provide information regarding possible health benefits of omega-3 fatty acid-rich seal oil particularly as they relate to cardiovascular health; and continue research and explore the possibility of including seal oil into the next iteration of the Canada Food Guide.

E. Dealing with the Sable Island Grey Seal Herd

In the Eastern Scotian Shelf (NAFO management area 4VsW), the population of cod crashed in the 1980s and remains very low. This fishery was not opened commercially after the closure in 1993. There has been a modest increase in the number of cod over the past five years. In fact, the current biomass is slightly higher than the limit reference point (Table 2). Of note, the disappointing recovery in this area is occurring where the population of grey seals is the most dense.⁷⁰

The population of grey seals is between 260,000 and 320,000. The rate of increase for the Sable Island herd has slowed from 12.8% in the 1980s to about 4% in the last 5 years.

On average, 2-7 per cent of the seal diet in this management area is made up of cod. According to the FRCC, "modeling of grey seal and cod populations on the Eastern Scotian Shelf is less conclusive in predictions of the outcomes of management interventions."⁷¹ Many witnesses agreed. The latest Stock Assessment Review (SAR) concluded that grey seal predation was an important component of natural mortality for eastern Scotia Shelf cod, but not the main source of this high natural mortality which was unknown.⁷²

⁷⁰ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. Jeffrey Hutchings, Professor of the Department of Biology, Dalhousie University).

⁷¹ Department of Fisheries and Oceans (2011), p. 33.

⁷² Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Doug P. Swain, Scientist, Marine Fish Ecosystems, Marine Fish Section, Department of Fisheries and Oceans).

Nevertheless, the impact of the abundance of grey seals in this area is still tangible. The FRCC estimated that “the rate of predation mortality predicted from the most conservative estimates of consumption by approximately 300,000 grey seals on Sable Island is an order of magnitude greater than the total fishing mortality from scientific sampling and bycatch.”⁷³ Testimony from fishermen and fish processors working at sea and near shore indicates that the frequency, intensity, and nature of interactions between seals and fishermen are escalating.

We would like to see, as an industry group, the grey seal herd on the Scotian Shelf, mainly the Sable Island breeding colony, reduced by 50 per cent.⁷⁴

*Mr. Denny Morrow, Former Executive Director,
Nova Scotia Fish Packers Association*

A few years ago, DFO commissioned a Logistical Evaluation of Options to Manage the Grey Seal Population on Sable Island. The October 2009 report prepared by an external consultant evaluated the reduction of the grey seal population on Sable Island either through the removal and disposal of over 200,000 animals over 5 years, or through the administration of an immunocontraceptive vaccine to 16,000 females per year for 5 years.⁷⁵

Referring to the first option, one witness wrote the following:

Meanwhile, DFO Management was being proactive. On May 27, 2010 the CBC reported [...] that a DFO Management contract had been let that posed the question: “How could we remove thousands of Grey seals from Sable Island?” The answer: fly over bulldozers, front-end loaders, and incinerators to Sable Island, and burn tens of thousands of Grey seal carcasses.⁷⁶

⁷³ Fisheries Resource Conservation Council (2011), p. 32.

⁷⁴ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Denny Morrow, Former Executive Director, Nova Scotia Fish Packers Association).

⁷⁵ CBCL Limited Consulting Engineers, *Logistical Evaluation of Options to Manage the Grey Seal Population on Sable Island*, Prepared for the Department of Fisheries and Oceans, October 2009.

⁷⁶ Dan Lane and Bruce Hatcher (2012).

The Committee heard that there would be little public support for the removal and disposal of thousands of animals from Sable Island. The area has just become Canada's newest National Park.⁷⁷

The second option evaluated by DFO's external consultant concerned the use of contraceptive methods to manage the grey seal population. This option is believed to be more acceptable when considering ethics, social good, public perception, and international market implications. It however appears to the Committee to be very expensive, demanding from a logistic point of view, and potentially dangerous given the requirement to capture large live animals. One witness, Denny Morrow, Former Executive Director of the Nova Scotia Fish Packers Association, nevertheless suggested to "begin population reduction of the Sable Island colony through a program of contraception inoculation of female grey seals on the island during breeding season."⁷⁸

The Committee heard little evidence about the effectiveness of a grey seal contraception program on Sable Island.

The Committee therefore recommends:

Recommendation 7

That the Government of Canada re-assess the various options for the sustainable management of the grey seal herd on Sable Island and other areas of the Eastern Scotian Shelf.

CONCLUSION

The Standing Senate Committee on Fisheries and Oceans believes that the recovery of cod and groundfish stocks is critically important, first to prevent the extirpation of these fish from the region, and second, to allow communities to benefit from healthy cod or groundfish fisheries. During the course of its study, the Committee heard from fishermen,

⁷⁷ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Susanna Fuller, Marine Conservation Coordinator, Ecology Action Centre).

⁷⁸ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Denny Morrow, Former Executive Director, Nova Scotia Fish Packers Association).

scientists, environmental organizations, government officials, First Nations and others who share this view.

We are doing everything we can in terms of a moratorium and ensuring that we minimize bycatch of this stock. However, we are seeing a situation where in the absence of further action, we will not see the rebuilding of the cod stock. That will mean that all of the communities that have depended historically on that resource for their livelihoods will have no prospect of seeing the possibility of the stock rebuilding and being able to resume fishing and have the opportunity of processing the resource in their communities in the future.⁷⁹

*Mr. David Balfour, Senior Assistant Deputy Minister,
Ecosystems and Fisheries Management, Department of Fisheries and Oceans*

It is in support of cod recovery that the Committee has made its first recommendation which deals with establishing recovery targets and timelines, and limit reference points for all depleted fish stocks, as well as two subsequent recommendations (3rd and 7th recommendations) referring to the control of the population of grey seals in the southern Gulf of St. Lawrence and Sable Island. These three recommendations aim to restore cod stocks to their conservation limit reference point within 20 years. The recommendation to reduce the number of seals is contingent on a strong cod recovery plan. A corollary recommendation (4th recommendation) establishes the conditions under which a respectful harvest should take place, introducing animal welfare considerations and financial compensation for fishermen.

I would like to state up front that I do not concur with a cull/bounty scenario as a management solution...there are better alternatives than simply engaging in removals that will underutilize a valuable opportunity for Canadians.⁸⁰

*Mr. Shannon Lewis, Executive Director,
Northeast Coast Sealers Cooperative of Newfoundland*

⁷⁹ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 25 October 2011, 1700 (David Balfour, Senior Assistant Deputy Minister, Ecosystems and Fisheries Management, Department of Fisheries and Oceans).

⁸⁰ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 29 October 2011, 1400 (Shannon Lewis, Executive Director, Northeast Coast Sealers Cooperative of Newfoundland).

The Committee would strongly prefer that grey seals be harvested rather than culled. Towards that end, two additional recommendations about the sustainability of the harvest and the full utilization of the resource (5th and 6th recommendations) were made to encourage the federal government to get engaged on product development and market access for seal products so that the targeted reduction is not wasteful of Canada's natural resources.

While the decision to cull or not to cull is a political choice, it is the role of science and scientists to inform the debate, educate the public, illuminate the political choices, and provide options for policy makers.⁸¹

*Dr. David M. Lavigne, Science Advisor,
International Fund for Animal Welfare*

Finally, the Committee recommends actions to address the knowledge gaps that hamper the development of policy options and make it difficult for resource managers and scientists to inform decision-makers and the public (2nd recommendation and part of the 3rd). The Committee supports fisheries research that can be used to find and communicate solutions to complex management issues.

The Committee understands that recommending a targeted removal carries ecological, political and economic risks. Despite the possible push back against the targeted removal of grey seals, the Committee believes that this is the best course of action under the circumstances. It is hoped that through an inclusive cod recovery plan, the targeted reduction of grey seals and simultaneous development of markets for seal products, a healthy cod fishery and a valuable seal harvest will help coastal communities in Atlantic Canada and Quebec be vibrant and prosperous places to live.

⁸¹ Senate, Standing Committee on Fisheries and Oceans, Evidence, 1st Session, 41st Parliament, 13 March 2012, 1700 (Dr. David M. Lavigne, Science Advisor, International Fund for Animal Welfare).

APPENDIX A: RECOMMENDATIONS

Recommendation 1

That the Department of Fisheries and Oceans continue to identify recovery targets and timelines, and limit reference points in accordance with the existing precautionary approach framework, for all depleted fish stocks, starting in the southern Gulf of St. Lawrence.

Recommendation 2

That the Department of Fisheries and Oceans coordinate and participate in a scientific research agenda to address the knowledge gaps identified by witnesses during this study, in order to address unique situations such as those that prevails on Sable Island and Hay Island. These gaps include the percentage of cod in the seal diet, the seals' range on the Eastern Scotian Shelf, and the application of alternative management methods.

Recommendation 3

That starting with the 2013 season and for a period of four years, the Department of Fisheries and Oceans implement and manage a grey seal targeted removal program in the southern Gulf of St. Lawrence to reduce the level of the herd by 70,000 animals; and, that this program, based on the Fisheries Resource Conservation Council's report entitled "Towards Recovered and Sustainable Groundfish Fisheries in Eastern Canada", work in conjunction with continuing research and evaluation which should lead to a long term sustainable management plan of grey seals in Atlantic Canada and Quebec;

That research protocols to be performed during the removal of grey seals be established to test the hypothesis that predation is the major factor preventing recovery of groundfish stocks in the southern Gulf of St. Lawrence, as well as to better understand and monitor the effects of the target removal; and,

That Department of Fisheries and Oceans officials appear before the Standing Senate Committee on Fisheries and Oceans at the earliest opportunity after the first harvesting season to report on the progress made with the grey seal targeted removal program.

Recommendation 4

That the harvest of grey seals be performed by qualified and trained seal harvesters under the monitoring of at-sea observers in a manner respectful of established humane harvesting protocols; and,

That adequate and fair compensation, the level of which yet to be determined, be provided to seal harvesters for each dispatched animal.

Recommendation 5

That the Department of Fisheries and Oceans support a long term sustainable grey seal harvest on the East Coast of Canada by:

- Auditing all sealing activities ensuring that all protocols, humane and ethical harvest practices, and general “best practices” in management are being adhered to;
- Playing a role of primary scientific advisor to the industry; and,

That the Government of Canada and its agencies promote grey seal-derived products and develop domestic and international markets for them.

Recommendation 6

That the Government of Canada (Health Canada) provide information regarding possible health benefits of omega-3 fatty acid-rich seal oil particularly as they relate to cardiovascular health; and continue research and explore the possibility of including seal oil into the next iteration of the Canada Food Guide.

Recommendation 7

That the Government of Canada re-assess the various options for the sustainable management of the grey seal herd on Sable Island and other areas of the Eastern Scotian Shelf.

APPENDIX B: WITNESSES

Name of Organization and Spokesperson	Date
<p>Department of Fisheries and Oceans: David Balfour, Senior Assistant Deputy Minister, Ecosystems and Fisheries Management; Siddika Mithani, Assistant Deputy Minister, Ecosystems and Oceans Science Sector; Patrice Simon, Director, Environment and Biodiversity Science.</p>	2011.10.25
<p>Fisheries Resource Conservation Council: Gerard Chidley, Former Chairman; Donald Walker, Former Vice Chairman; Mike Calcutt, Acting Executive Director.</p>	2011.11.01
<p>Canadian Sealers Association: Eldred Woodford, President; Frank Pinhorn, Executive Director.</p>	2011.11.15
<p>Seal Hunters Association of the Magdalen Islands: Denis Longu��p��e, President; Gil Th��riault, Director; Ghislain Cyr, Member.</p>	2011.11.29
<p>NuTan Furs Incorporated: Dion Dakins, Director.</p> <p>Fur Institute of Canada: Rob Cahill, Executive Director.</p> <p>University of Prince Edward Island: Pierre-Yves Daoust, Professor of Anatomic Pathology and Wildlife Pathology, Atlantic Veterinary College.</p>	2011.12.06
<p>Department of Fisheries and Oceans: France P��geot, Senior Assistant Deputy Minister, Strategic Policy; Michael Pearson, Director General, International Affairs; Morley Knight, Director General, Resource Management.</p> <p>Foreign Affairs and International Trade Canada (DFAIT): Kevin Thompson, Director, Government Procurement, Trade and Environment Division.</p>	2012.02.07
<p>International Fund for Animal Welfare: David M. Lavigne, Science Advisor.</p>	2012.02.14
<p>Dalhousie University: Jeffrey Hutchings, Professor of the Department of Biology and Chair of the Royal Society of Canada Expert Panel on Sustaining Canadian Marine Biodiversity.</p>	2012.03.13
<p>Pacific Balance Consulting Inc.: Chief Roy S. Jones, Jr., President.</p>	2012.03.27

<p>Department of Fisheries and Oceans: Morley Knight, Director General, Resource Management; Mike Hammill, Section Head, Marine Mammals Biology and Conservation; Nell den Heyer, Biologist, Population Ecology Division, Science Branch (Maritimes); Doug P. Swain, Scientist, Marine Fish Ecosystems, Marine Fish Section.</p> <p>Dalhousie University: Boris Worm, Associate Professor, Department of Biology; Sara Iverson, Professor, Department of Biology; Heike K. Lotze, Associate Professor and Canada Research Chair in Marine Renewable Resources, Department of Biology.</p> <p>Eastern Fishermen's Federation: John Levy, Secretary; Ronnie Heighton, Board Member; Wilford D. Smith, Board Member.</p> <p>Department of Fisheries and Aquaculture of Newfoundland and Labrador: The Honourable Darin King, MHA, Minister of Fisheries and Aquaculture; Alastair O'Rielly, Deputy Minister.</p>	<p>2012.03.29 Halifax, Nova Scotia</p>
<p>Grey Seal Conservation Society: Debbie MacKenzie, Director.</p> <p>Ecology Action Centre: Susanna Fuller, Marine Conservation Coordinator; Robert K. Mohn, Independent Scientist.</p> <p>Nova Scotia Fish Packers Association: Denny Morrow, Former Executive Director; Adlai Cunningham, Director (Sea Star Seafoods Limited); Claude d'Entremont, Director (Inshore Fisheries Limited); Dick Stewart (Atlantic Herring Co-op); Richard "Bee" d'Entremont, Member (Acadian Fish Processors Limited).</p> <p>Northeast Coast Sealers Cooperative of Newfoundland: Shannon Lewis, Executive Director.</p> <p>As an individual: Robert O'Boyle, Scientist.</p> <p>Atlantic Policy Congress of First Nations Chiefs Secretariat: John Paul, Executive Director.</p> <p>Prince Edward Island Fishermen's Association Ltd.: Ian MacPherson, Executive Director; Danny Arsenault, Director.</p>	<p>2012.03.29 Halifax, Nova Scotia</p>

APPENDIX C: BRIEFS AND CORRESPONDENCE

Briefs and Correspondence	Date
<p>"Update on the Prospects of Developing a Bioprosthetic Heart Valve from Seal Tissue" by Philippe Pibarot, Full Professor, Département de Médecine, Université Laval and Canada Research Chair in Valvular Heart Diseases, Institut Universitaire de Cardiologie et de Pneumologie de Québec.</p>	2012.03.07
<p>The Honourable Michael Olscamp, MLA, Minister of Agriculture, Aquaculture and Fisheries, Department of Agriculture, Aquaculture and Fisheries of New Brunswick, <i>Letter in response to the invitation to appear before the Standing Senate Committee on Fisheries and Oceans as part of the study on the management of the grey sea population off Canada' East Coast.</i></p>	2012.03.20
<p>Bridget Curran, Director, Atlantic Canadian Anti-Sealing Coalition, <i>Response to the invitation to appear before the Standing Senate Committee on Fisheries and Oceans as part of the study on the management of the grey sea population off Canada' East Coast.</i></p>	2012.03.26
<p>The Honourable Sterling W.W. Belliveau, MLA, Minister of Fisheries and Aquaculture, Department of Fisheries and Aquaculture of Nova Scotia, <i>Letter in response to the invitation to appear before the Standing Senate Committee on Fisheries and Oceans as part of the study on the management of the grey sea population off Canada' East Coast.</i></p>	2012.03.28
<p>"Management of grey seals: Issues related to welfare and animal rights" by Lyne Létourneau, Associate Professor, Department of Animal Sciences, Faculty of Agriculture and Food Sciences, Université Laval.</p>	2012.04.02
<p>"Presentation to Canadian Senate Standing Committee on Fisheries & Oceans" and "Plan for Hay Island's Grey Seals (PHIGS) in Atlantic Canada [Draft for discussion] : Business Case for a Commercial Grey Seals Fishery on Hay Island, Cape Breton in the Scaterie Island Wilderness Area" by the Canadian Fisheries, Oceans and Aquaculture Management (C-FOAM) Research Group of the Telfer School of Management at the University of Ottawa (Daniel E. Lane, Director of C-FOAM, Bruce Hatcher, Associate of C-FOAM and University Chair in Marine Ecosystem Research, Director of the Bras d'Or Institute, Cape Breton University, and Ira Grover, Research Assistant).</p>	2012.04.02

<p>Michael Bernard, Political Officer, Humane Society International/Canada, <i>Response to the invitation to appear before the Standing Senate Committee on Fisheries and Oceans as part of the study on the management of the grey sea population off Canada' East Coast.</i></p>	2012.04.27
<p><i>Several letters and emails were also received by the Committee, at various dates, throughout the study on the management of the grey seal population off Canada' East Coast.</i></p>	