Grey Seals in Atlantic Canada: to Cull or Not to Cull?
The successful recovery of grey seals from near extirpation in the late 1940s has spurred an ongoing debate around the possible impacts of seal predation on fish, namely cod, as well as other fish species of commercial and conservation interest. Fuelling the debate is the recent growth of grey seal populations in the Northwestern Atlantic and concurrent decline of several fish populations. In some cases fish stocks have collapsed, leading to the cessation of commercial fishing for some species in certain areas altogether.

It has been suggested that the removal of grey seals would remedy declines in fish stocks and increase opportunities for commercial fishing. While this hypothesis has been used as motivation for the implementation of large-scale grey seal culls, scientific evidence does not support this claim. Nonetheless, a cull of grey seals remains on the political agenda in Canada, raising serious questions about the potential costs or benefits of such an initiative in relation to ecological, economic, and ethical concerns.
One of the largest seals inhabiting the Eastern Seaboard, grey seals (*Halichoerus grypus*) are distinguished by their long, arched, horse-like nose as well as their heavy shoulders and thick skin about the neck. They haul out on exposed reefs or beaches on undisturbed islands and are considered quite noisy, with vocalizations akin to that of wolves – a trait which may be the source of the French term “loups marins,” or “sea wolves.”

In the Northwest Atlantic, grey seals comprise a single genetic population divided into three groups based on the location of their main breeding concentrations. Breeding occurs on islands, isolated beaches or pack ice, with the majority of pups born on Sable Island (81%); the remainder on drifting pack ice and small islands in the Gulf of St. Lawrence (15%), and on small islands along the eastern shore of Nova Scotia (4%).

Pups are born with a white lanugo – a coat of delicate, downy white fur – which they begin to shed approximately 15 days after birth and which is completely replaced with a black-spotted, silver coat by 25 days old, at which point they are referred to as “beaters.”

The total estimated size of the Northwest Atlantic grey seal population in 2010 was 348,900 (95% CI = 291,300 - 414,900). Considered a coastal or continental shelf species, grey seals prefer areas with water depths of less than 200 m. Herds feed in coastal and offshore waters, with the largest herd located on Sable Island with an estimated population size of 277,400 animals (95% CI = 249,600 - 308,300). In the Gulf of St. Lawrence, grey seals number around 60,500 (95% CI = 32,700 - 92,800), and the smallest of the three herds, off the East Coast of Nova Scotia, numbers around 11,000 seals (95% CI = 9,100 - 13,900). Seals from each of these herds cover a wide range while foraging throughout the year. Their distributions may overlap, and may contribute to the colonization of new breeding sites.
History of Grey Seal Exploitation in Canada

Grey seals were at one time very abundant and widely distributed along the Canadian East Coast and in the Gulf of St. Lawrence. During early European exploration of the Gulf of St. Lawrence, large numbers of grey seals were seen along the lower North Shore. Throughout the 1600s, grey seals were hunted throughout the Gulf and in the Gaspé area, outside of the Gulf, and large pupping colonies of grey seals were exploited in southwest Nova Scotia, where as many as 800 pups were reportedly killed on a single day.7

By the 1800s, walrus on the Magdalen Islands had been extirpated, and grey seal hunting increased as alternative sources of oil were sought. This resulted in a severe reduction of seals by the mid-to-late 1800s in the Gulf and on Sable Island. Several reports on seal species in the Gulf during this period fail to mention grey seals at all, an indication on how rare they had become. By the mid-1900s the grey seal in eastern Canada was considered “uncommon and rare” but they continued to be hunted. In 1966, one estimate conservatively placed the total grey seal population at a meagre 5,600 animals.8

Despite the low population estimates, grey seals continued to be exploited. From 1967 to 1984, the Department of Fisheries and Oceans (DFO) selectively killed pups in an attempt to further reduce the population, with annual kills ranging from 114 to 2,375 during this period. In addition, from 1978 through 1990 a bounty of $50/adult and $25/pup9 was placed on the grey seal in the Maritimes, Newfoundland, and Quebec, during which time a further 4,379 animals were reported killed.10

In the last 50 years the grey seal population in Atlantic Canada has rebounded to about 350,000 animals.11 Although some
believe that current populations are at a historical high, the reality is that we do not know what populations of grey seals were prior to the 1960s. We know only that the species was sufficiently abundant to sustain the oil industry for two centuries.

Proposed Grey Seal Culls

The fishing industry has been demanding a cull of grey seals for most of the past century, in the belief that seals are having an impact on fish stocks. A 1929 Fisheries Report from Nova Scotia refers to the seals as a “menace” to be destroyed in the interest of fishermen due to their “destructive tendencies.”

The Fisheries Resource Conservation Council (FRCC) has expressed fishermen’s dissatisfaction with grey seals since its inception in 1993, and has called for a cull of grey seals in every recommendation submitted to Ministers of Fisheries and Oceans regarding Gulf of St. Lawrence groundfish from 1994 until its disbandment in 2011.

In May 2010, a report prepared for DFO outlining two scenarios to control grey seal populations on Sable Island was revealed. The report explored the logistics and costs of two seal control strategies – an immunocontraceptive vaccine program, and a population reduction (cull) that would involve the slaughter and incineration of 220,000 grey seals over a five-year period.

A Department of Fisheries and Oceans workshop held in October 2010 recommended a targeted removal of 73,000 grey seals over a five-year period, plus an additional 1,700 pups per year. Yet another scenario put forth by DFO discusses an “experimental” removal of 78,000 adult grey seals, plus annual removals of 1,700 for five years. Before it was disbanded, the FRCC offered yet another culling option by calling for an initial removal of 73,000 seals within the first two years and continued reductions thereafter, totaling 146,000+ animals.

Grey Seal Hunting in Canada Today

The Department of Fisheries and Oceans (DFO) currently sanctions a commercial grey seal hunt off the coast of Atlantic Canada. The commercial hunt for juvenile grey seals usually runs from early February until early March, with catches taken mainly along the eastern shore of Nova Scotia and in the southern Gulf of St. Lawrence.

<table>
<thead>
<tr>
<th>Year</th>
<th>Grey Seal Quota</th>
<th>Reported Catch^{12}</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>12,000</td>
<td>1,747</td>
</tr>
<tr>
<td>2008</td>
<td>12,000</td>
<td>1,471</td>
</tr>
<tr>
<td>2009</td>
<td>50,000</td>
<td>263</td>
</tr>
<tr>
<td>2010</td>
<td>50,000</td>
<td>58</td>
</tr>
<tr>
<td>2011</td>
<td>60,000</td>
<td>195</td>
</tr>
<tr>
<td>2012</td>
<td>60,000</td>
<td>0</td>
</tr>
</tbody>
</table>

Despite increases in the total allowable catch (TAC), the number of seals killed remains relatively small. In fact, in 2009 and 2010, the hunt was essentially avoided altogether as buyers for pelts could not be found. Inexplicably, in 2011 the TAC was increased to 60,000 which would have constituted nearly 80% of the grey seal pups born had it been reached. A nearly nonexistent hunt in 2012 was blamed on poor weather conditions and shrinking international markets for seal products, with sealers reporting that no animals were killed.

IN ADDITION TO GREY SEALS, OTHER MARINE MAMMALS IN CANADA HAVE LONG BEEN VIEWED AS COMPETITORS FOR FISH, AND GOVERNMENTS HAVE ATTEMPTED TO ELIMINATE THEM. AT ONE TIME, MILITARY AIRCRAFT WERE USED TO BOMB HERDS OF STELLER SEA LIONS IN BRITISH COLUMBIA. IN THE LATE 1920s, QUEBEC FISHERMEN WERE SUBSIDIZED TO SHOOT THE “WHITE DEVILS” (BELUGA), AND BOMBS AND TORPEDOS WERE DROPPED FROM AIRCRAFT ON THESE NOW-THREATENED CREATURES THAT WERE SAID TO BE CONSUMING TOO MANY COD AND SALMON. ALTHOUGH POLITICIANS DECLARED VICTORY IN THE “WAR” ON WHALES, COD REMAINED NOTABLY ABSENT FROM THE FISHING GROUNDS.
Science Does Not Support a Grey Seal Cull

Scientists have not yet done the kinds of analyses — including multispecies modeling — required for a proper scientific evaluation of any proposal to cull grey seals.

In fact, a report on the Impacts of Grey Seals on Fish Populations in Eastern Canada acknowledged these shortcomings, stating that "although widely practiced, the extent of seal population reduction and the response of targeted prey populations to culls have rarely been evaluated, such that their effectiveness is poorly understood. Further, results from other predator-control programs indicate that unintended consequence in food webs, that will be difficult to predict, are nonetheless commonly observed."  

A recent paper examined cases of culling vertebrate predators and found that where culls of marine predators have been attempted, in almost all cases the removals had either unknown or no effects on fish stocks, even in cases where marine mammal populations were reduced by 50-80%.

Large-scale removals of grey seals in an effort to enhance fish stocks have been undertaken in the United Kingdom, United States, Norway, Iceland and the Baltic Sea, with either unknown or no effects on the fish stocks they were intended to benefit. In the North and Baltic Seas, large-scale, natural die-offs of harbour and grey seals resulted in a population reduction of 40-60%, again without any detectable benefits to fish stocks in the region.

There are also credible scientific analyses that suggest that the culling of grey seals by whatever means might not be sufficient to allow for the recovery of Atlantic cod and other depleted fishes in the southern Gulf of St. Lawrence. The effects of a cull on the recovery of cod cannot be credibly predicted from a science perspective.

Dr. Jeff Hutchings, Department of Biology and Chair of the Royal Society of Canada Expert Panel on Sustaining Canadian Marine Biodiversity, Dalhousie University. Testimony to the Standing Senate Committee on Fisheries and Oceans, 13 March 2012.

It is unlikely that a seal cull in Eastern Canada would have a substantial positive effect on cod populations.

Dr. Heike K. Lotze, Associate Professor and Canada Research Chair in Marine Renewable Resources, Department of Biology, Dalhousie University, Halifax. Testimony to the Standing Senate Committee on Fisheries and Oceans, 29 March 2012.
All methods, when used correctly, have indicated generally low to very low importance of cod in the diet of the overall grey seal population.

Dr. Sara Iverson, Professor, Department of Biology, Dalhousie University. Testimony to the Standing Senate Committee on Fisheries and Oceans, 29 March 2012.

Grey Seals and Cod Consumption

Though some members of a DFO Scientific Advisory Panel were eager to state that grey seal predation could account for high rates of cod mortality, there is no simple and general relationship among grey seal numbers, their consumption of variously-sized cod, and estimates of cod mortality.

Small herring, hake and medium-sized cod are among the species most commonly observed in diets of grey seals from the Gulf of St. Lawrence, while sand lance, redfishes, flatfishes, cod and witch flounder are important prey on the Scotian Shelf.

To date, efforts to assess the amount and constitution of fish consumed by grey seals have been fundamentally deficient. In the specific case of grey seals in Atlantic Canada, current characterizations of the diet are compromised by limited sampling in specific locales throughout the year, and by small sample sizes. In addition to challenges in determining what a grey seal has eaten, it is also difficult to obtain a representative sample of the diet from grey seals because they range widely and their diet varies by sex, season, area and other factors.

These problems are further exacerbated by the lack of recent information on feeding behaviour of grey seals in relation to the distribution of cod. Co-occurrence of grey seals and cod does not necessarily indicate predation, nor can it be used to determine whether cod and seals are

Because seals primarily consume forage fish, it is even conceivable that a reduction of seal numbers would lead again to an increase in those forage fish, which could have some negative effect on cod recovery.

Dr. Boris Worm, Marine Research Ecologist, Department of Biology, Dalhousie University. Testimony to the Standing Senate Committee on Fisheries and Oceans, 29 March 2012.
feeding on the same prey. Recent analyses indicate that further grey seal diet samples are needed to determine whether grey seals are targeting large cod and are responsible for their high mortality.\footnote{31}

The good news is that some cod in Atlantic Canada are showing signs of recovery – even in the presence of seals. While there is some disagreement among government scientists on the matter,\footnote{32} there is evidence that cod stock biomass on the Scotian Shelf has recently shown an increase – along with an improved survivorship of young cod – in the presence of an abundant grey seal population on Sable Island. Such a recovery is not consistent with the hypothesis that seal predation is a primary driver in the dynamics of cod stocks. In fact, because seals primarily consume forage fish, it is possible that a reduction of seal numbers would lead to an increase in those forage fish – resulting in a negative effect on cod recovery.

And elsewhere in Atlantic Canada, at least one other cod stock is showing signs of recovery, with the cod spawning stock on the southern Grand Banks showing an increase of 69\% since 2007,\footnote{34} even in the presence of seals that many claim are impeding their recovery.

**Codworm and Culling**

Codworm \textit{(Pseudoterranova decipiens)}, is a parasitic roundworm that infests several species of fish and seal around the world. Levels of abundance of codworm in Eastern Canada are similar to those from many European areas,\footnote{35} and while there is little evidence that codworm has any effect on fish behaviour and mortality,\footnote{36} it reduces the economic value of fish.

Some have suggested that a reduction in the population of grey seals will result in fewer incidences of codworm. However, there is no evidence that changes in seal abundance will lead to corresponding changes in codworm infection parameters in fish.\footnote{37} Large-scale reductions of seals in Norway and Iceland did not affect the abundance of codworm in cod.\footnote{38}
It seems highly unlikely that the culling of seals would have a measurable benefit on the recovery of cod or indeed other groundfish… it could even have a negative effect.

Dr. Boris Worm, Marine Research Ecologist, Department of Biology, Dalhousie University. Testimony to the Standing Senate Committee on Fisheries and Oceans, 29 March 2012.

Culling Seals Could Change the Entire Ecosystem

Not only has the DFO failed to explore factors that impact cod stocks beyond grey seals, they have not begun to analyze the potential ramifications of a grey seal cull on marine ecosystems. It is risky to gamble with fisheries and marine ecosystems by proceeding with a seal cull without having conducted the necessary scientific evaluation; and even the DFO acknowledges that a cull could have unintended, unexpected consequences — ones that could be detrimental to cod recovery.

Many of those sealers are also fishermen and therefore they would hope that by reducing this population that would help other industries. But that’s our problem, as a human species, we always look on a short-term basis. We don’t look on long-term negative impact of some of our actions.

Dr. Pierre-Yves Daoust, Professor of Anatomic Pathology and Wildlife Pathology, Atlantic Veterinary College, University of Prince Edward Island.
The High Costs of Culling

The cost of implementing the various cull scenarios would be significant – both economically and politically. The cost of the proposal to kill and incinerate seals on Sable Island was estimated at $35 million,41 the estimated cost of a science component and bounty program alone for a DFO proposal to remove 78,000 animals is at least $15 million.42 At these costs, and in light of recent budget cuts to DFO fisheries science, it’s difficult to understand how the government could justify spending millions of dollars on a scientifically Unsupported seal cull.

Given the lack of global markets for seal products, it seems unlikely that a grey seal cull could ever be commercially viable. Historically, there has never been a large demand for grey seal products, and with markets closing for seal products in general, it is unlikely that demand will emerge. Sealers themselves have expressed opposition to a seal cull without viable markets for the products.

To suggest today – when markets for all seal products are depressed – that the proposed grey seal cull would be commercially viable is entirely disingenuous. There are no markets for the grey seals products, and the culled seals would almost certainly be discarded at sea or in landfill, raising other environmental and ethical issues.

In addition to the financial costs of any cull, there also will be political costs. Internationally-renowned scientists have expressed concern that proceeding with a scientifically unsupported cull of grey seals would further diminish Canada’s reputation as a leader in marine science and ocean management.

“GIVEN THE CUTS AT DFO SCIENCE IN ENVIRONMENTAL MANAGEMENT AND MONITORING, IT IS DOUBTFUL THAT IT WOULD BE IN THE PUBLIC INTEREST TO FUND A CULL RATHER THAN THE SCIENTIFIC MONITORING AND ANALYSIS THAT WE ARE IN THE MIDST OF CUTTING.”

Susanna Fuller, Marine Conservation Coordinator, Ecology Action Centre, Halifax. Testimony to the Senate Standing Committee on Fisheries and Oceans, 29 March 2012.

“Experience has demonstrated that it is not economically viable to have a legitimized hunt [of grey seals]… there was not enough market to allow it to go forward. A commercial hunt cannot be successful given the international overtones.”

John Levy, Secretary, Eastern Fishermen’s Federation. Testimony to the Senate Standing Committee on Fisheries and Oceans, 29 March 2012.

“For grey seals, there has not been, in any of the recent years, any viable market for any number of seals.”

Morley Knight, DFO. Testimony to the Senate Standing Committee on Fisheries and Oceans, 29 March 2012.
determining the numbers of seals actually killed. A cull that involves herding and clubbing animals on land – as occurs on Hay Island, Nova Scotia – also does not meet modern animal welfare standards.43

Very little research has been conducted on slaughter methods for adult grey seals. Even veterinarians who are supportive of the sealing industry have expressed concern with proposals to cull grey seals, and the need for further research with respect to how the animals would be killed.

It is highly likely that a cull of grey seals would be inherently inhumane, raising serious ethical issues. Every recent veterinary report on seal hunting in Canada documents examples of the ongoing, unacceptable cruelty involved, and cites the need for improvements in humane killing practices, regulation, enforcement, and compliance.

Shooting seals in the water is a practice that several veterinary panels have judged to be unacceptable from an animal welfare perspective, and one that would result in the sinking of most grey seals, creating challenges in determining the numbers of seals actually killed. A cull that involves herding and clubbing animals on land – as occurs on Hay Island, Nova Scotia – also does not meet modern animal welfare standards.43

Very little research has been conducted on slaughter methods for adult grey seals. Even veterinarians who are supportive of the sealing industry have expressed concern with proposals to cull grey seals, and the need for further research with respect to how the animals would be killed.

“[I] HAVE SOME MAJOR MISGIVINGS… [I] STILL DOUBT THAT [A CULL] CAN BE DONE IN A WAY THAT IS APPROPRIATE WITH RESPECT TO ANIMAL WELFARE… THERE HAS BEEN NO CONCERTED STUDY OF APPROPRIATE METHODS OF HARVESTING THIS GROUP OF ANIMALS.”

Dr. Pierre-Yves Daoust, Professor of Anatomic Pathology and Wildlife Pathology, Atlantic Veterinary College, University of Prince Edward Island. Testimony to the Senate Standing Committee on Fisheries and Oceans, 6 December 2011.
Conclusion

Attempting to reduce Canada’s grey seal population in the misguided belief that it will benefit fisheries would be ecologically risky, scientifically irresponsible, economically indefensible and inherently inhumane.

It is dangerous and reckless for the Government of Canada to gamble with our fisheries and marine ecosystems by proceeding with a cull without having conducted the necessary scientific evaluations. Grey seals are a native species and a critical part of the complex marine ecosystem off the East Coast of Atlantic Canada. Using them as scapegoats for the myriad problems arising from overfishing, climate change and bycatch is an easy option, and one that will be popular with the fishing industry. However, to think that culling seals will aid in cod stock recovery is misguided and without scientific basis.

Proceeding with a cull of grey seals without proper scientific evaluation and fisheries recovery plans is nothing short of irresponsible. Culling grey seals would be a waste of taxpayers’ money, and could have international repercussions, both scientific and economic. There is much to risk losing by proceeding with a grey seal cull, and very little that we can expect to gain.

“The deliberate killing of one species native to Canada because of the human-induced depletion of another native species, ultimately caused by politically-expedient but scientifically-unjustified management decisions, would be difficult to defend from a variety of perspectives.”

Dr. Jeff Hutchings, Department of Biology and Chair of the Royal Society of Canada Expert Panel on Sustaining Canadian Marine Biodiversity, Dalhousie University. Testimony to the Standing Senate Committee on Fisheries and Oceans, 13 March 2012.

“As a Canadian scientist, I would like to respect and be proud of my country. I truly fear that the international repercussions would far outweigh anything in terms of trying to understand how Canada could be considered a responsible steward of their oceans.”

Dr. Sara Iverson, Professor, Department of Biology, Dalhousie University. Testimony to the Senate Standing Committee on Fisheries and Oceans, 29 March 2012.
Endnotes


