

# Action Plan for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic Population, in Canada

## Blue Whale, Northwest Atlantic Population



2020

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For copies of the action plan, or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports, residence descriptions, recovery strategies, and other related recovery documents, please visit the [Species at Risk Public Registry](#).

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## Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#) agreed to establish complementary legislation and programs that provide for the protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for preparing action plans for species listed as extirpated, endangered, and threatened, and for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the Species at Risk Public Registry, and every subsequent five years.

The Minister of Fisheries and Oceans is the competent minister under SARA for the Northwest Atlantic Blue Whale and has prepared this action plan to implement the recovery strategy, as per section 47 of SARA. The minister responsible for the Parks Canada Agency (PCA) is the competent minister for individuals in the waters of Forillon National Park. In preparing this action plan, the competent ministers have considered, as per section 38 of SARA, the commitment of the Government of Canada to conserving biological diversity and to adhering to the principle that, if there are threats of serious or irreversible damage to the listed species, cost-effective measures to prevent the reduction or loss of the species should not be postponed for a lack of full scientific certainty. To the extent possible, this action plan has been prepared in cooperation with PCA, Transport Canada (TC) and the Mingan Island Cetacean Study, as per section 48(1) of SARA.

As stated in the preamble to SARA, success in the recovery of species at risk depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions and actions set out in this action plan and will not be achieved by Fisheries and Oceans Canada (DFO) or any other jurisdiction alone. The cost of conserving species at risk is shared between different constituencies. All Canadians are invited to join in supporting and implementing this action plan for the benefit of the Northwest Atlantic Blue Whale and Canadian society as a whole.

Under SARA, an action plan provides the detailed recovery planning that supports the strategic direction set out in the recovery strategy for the species. The plan outlines recovery measures to be taken by DFO and other jurisdictions or organizations to help achieve the population and distribution objectives identified in the recovery strategy. Implementation of this action plan is subject to the appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

## **Acknowledgments**

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## Executive summary

The Northwest Atlantic Blue Whale was listed as Endangered under the *Species at Risk Act* (SARA) in 2005. This Action Plan is part of a series of documents regarding Blue Whale, including the [COSEWIC Status Report](#) (COSEWIC 2012), and the [Recovery Strategy](#) that should be taken into consideration together.

The Northwest Atlantic Blue Whale is a baleen whale that uses coastal and offshore Atlantic Canadian waters mainly in the summer to feed primarily on euphausiids, commonly known as krill.

The main threats to the recovery of the Northwest Atlantic Blue Whale are anthropogenic noise, lack of food availability, contaminants, collisions, disturbances, and entanglements. The Northwest Atlantic Blue Whale Recovery Strategy, published in 2009, proposed three recovery objectives intended to increase knowledge of the population, its habitat and threats, and implement measures to mitigate threats.

The action plan for the Northwest Atlantic Blue Whale identifies measures that will be implemented in the short and medium term to assist in meeting the recovery objectives. The first set of measures will be taken by Fisheries and Oceans Canada (DFO), and consists primarily of research aimed at estimating the size of the Northwest Atlantic Blue Whale population and its use of Canadian waters. These measures also include implementing regulations or policies to protect Blue Whale habitat and mitigate threats. The second set of measures will be implemented by DFO in partnership with the various stakeholders involved in Blue Whale recovery, and includes research on krill and the use of hydroacoustics to document the presence of these whales. The third set of measures consists of actions that stakeholders can take voluntarily, such as observations and photo-identification of Blue Whales and outreach and awareness initiatives.

An evaluation of the socio-economic costs of implementing the action plan and the benefits to be derived from its implementation is provided in section 2.

Recovery of the Northwest Atlantic Blue Whale depends on the commitment and cooperation of many organizations that will implement the measures set out in this action plan.

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# 1 Recovery actions

## 1.1 Context and scope of the action plan

The Blue Whale (*Balaenoptera musculus*) is a baleen whale that uses coastal and offshore Atlantic Canadian waters mainly in the summer (figure 1) to feed primarily on euphausiids, commonly known as krill, but there are also indications that part of the population remains in Canadian waters year-round (DFO 2018). The size of the Northwest Atlantic population is currently unknown, but experts estimate that the number of mature animals is unlikely to exceed 250 individuals.

The Blue Whale population in the Northwest Atlantic was designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in May 2002. This population was reassessed by COSEWIC in 2012 and its endangered status was confirmed. It was listed as Endangered under the *Species at Risk Act* (SARA) in January 2005. This Action Plan is part of a series of documents regarding Blue Whale, including the [COSEWIC Status Report](#) (COSEWIC 2012), and the [Recovery Strategy](#) that should be taken into consideration together. Under SARA, an action plan provides the detailed recovery planning that supports the strategic direction set out in a recovery strategy for the species. A recovery strategy also provides background information on the species and its threats, and critical habitat.

The "[Recovery Strategy for the Blue Whale \(\*Balaenoptera musculus\*\), Northwest Atlantic Population, in Canada](#)" (Beauchamp et al. 2009) presents the various threats facing the population. Commercial whaling carried out historically in the Atlantic Ocean reduced the population by about 70%; at least 11,000 Blue Whales were killed before the 1960s including at least 1,500 animals in eastern Canadian waters. In addition to historical whaling and natural sources of mortality such as ice entrapment and predation, several threats have been identified and their general level of concern assessed. The level of concern depends on the potential impact of the threat on the population, knowledge on the threat, and its extent within the distribution range. The main threats to the recovery of the Northwest Atlantic Blue Whale population were determined by experts to be anthropogenic noise, which causes a degraded underwater acoustic environment and alters behaviour, and the lack of food resources, which could result from ecosystem changes, caused in particular by climate change.

Contaminants, vessel collisions, disturbances caused by whale watching activities, entanglements in fishing gear, epizootics, toxic algal blooms and toxic spills also pose a threat to the Blue Whale. Based on the best available information when the recovery strategy was published in 2009, these threats were assessed as presenting a low level of concern, either because their impact was considered low, very localized or difficult to quantify, or because the threats were considered potential. Based on new data from photo-identification (Gaspard et al. 2017), the impact of the threat of entanglement in fishing gear needs to be reassessed, as it may be more significant than previously understood. Given the small size of the Blue Whale population, even activities that affect a small number of individuals can have a significant impact on survival of the species in the Atlantic Ocean.

The long-term goal of the recovery strategy is to reach a total of 1,000 mature individuals. To reach this recovery goal, three objectives were set for the Canadian range:

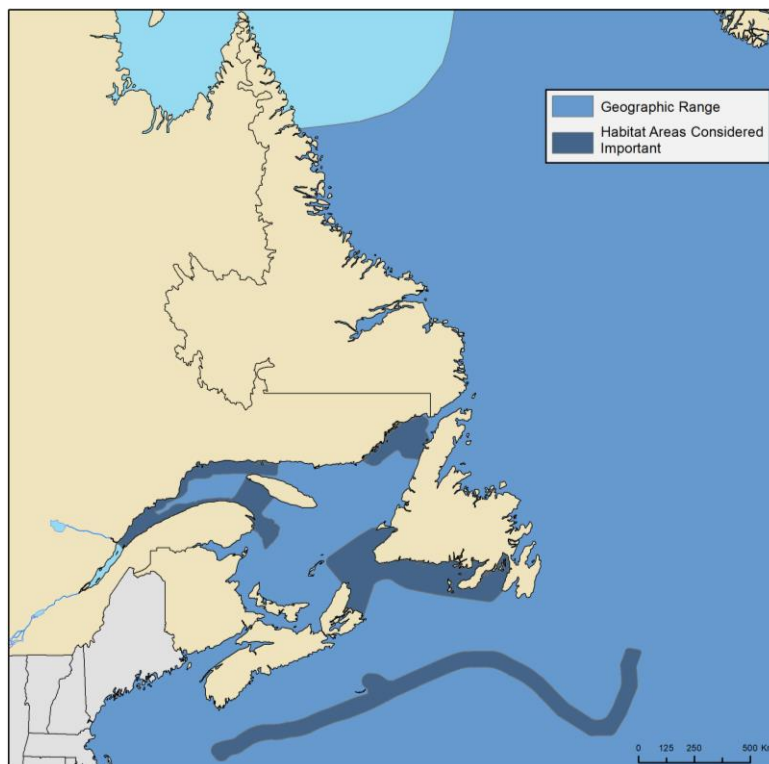
**Objective 1:** define and conduct a long-term assessment of the size, structure and trends of the Northwest Atlantic Blue Whale population, and determine their range and critical habitat within Canadian waters.

**Objective 2:** implement control and monitoring measures for activities that could hinder the recovery of the Blue Whale in its Canadian range.

**Objective 3:** increase knowledge of the main threats to the recovery of the Blue Whale in Canadian waters both to determine their true impact and to identify effective measures to mitigate the negative consequences for the population's recovery.

The recovery strategy identified recovery approaches based on three broad strategies: 1) research and monitoring, 2) conservation, and 3) awareness and education. The purpose of this action plan is to outline priority actions to meet the above recovery objectives, following the same broad strategies. These actions are related to all the threats described in the recovery strategy and pertain to the full range of the population in Atlantic Canada's waters. The recovery strategy provides more details on: the strategies and approaches for recovering Northwest Atlantic Blue Whales, the studies that have been undertaken as well as those that are recommended to identify their critical habitat, and their biology (Beauchamp et al. 2009).

Under section 47 of SARA, the competent minister must prepare one or more action plans based on the recovery strategy. Action planning for species at risk recovery is therefore an iterative process. The Implementation Schedule in this action plan may be modified in the future depending on the level of progress made towards recovery.



**Figure 1. Geographic range (medium blue) and habitat areas considered important (darker blue) for the Blue Whale in the Northwest Atlantic Ocean. Adapted from DFO 2018.**



## 1.2 Measures to be taken and Implementation Schedule

Successful recovery of this population is not dependent on the actions of any single jurisdiction; rather, it requires the commitment and cooperation of the many different constituencies involved in implementing the directions and measures set out in this action plan.

This action plan provides a description of measures that maximize the likelihood of achieving the population and distribution objectives for the Northwest Atlantic Blue Whale. It also includes measures to address threats to the population and monitor its recovery in order to guide not only activities to be undertaken by Fisheries and Oceans Canada (DFO), but also those for which other jurisdictions, organizations and individuals have a role to play. DFO strongly encourages all Canadians to participate in the conservation of the Blue Whale by supporting and implementing the priority recovery measures outlined in this action plan. DFO recognizes the important role of key players in the implementation of recovery measures for this population.

The following three tables are not intended to present all the measures that could be taken to foster the Blue Whale's recovery; instead, they target measures likely to be taken in the short and medium term (within the next 5 to 10 years). These measures are technically and financially feasible and will help identify additional measures that could be implemented in the longer term based on the knowledge that will be acquired. Given that the Northwest Atlantic Blue Whale has a vast range, the proposed research focuses on targeted areas to optimize results and efficiency. Much of this research could help support future critical habitat identification.

Table 1 identifies measures to be taken by DFO to support the recovery of the Blue Whale. This table primarily presents research and monitoring measures that will be led by DFO, due to the complex logistics involved in monitoring a Blue Whale population with such a vast range. This research is a continuation or logical extension of studies already performed by DFO as part of the recovery strategy and as part of its mandate for marine mammal conservation. For an overview of the research activities and conservation and awareness measures carried out from 2009 to 2014, see the [Report on the Progress of Recovery Strategy Implementation for the Blue Whale, Northwest Atlantic Population](#) (DFO 2016). The measures listed in table 1 as well as tables 2 and 3 address the three recovery objectives:

**Objective 1. Increase knowledge of the population and its size (measures 1 to 3):** A better understanding of the high-concentration areas of Blue Whales will make it possible to carry out targeted surveys to assess the population size more effectively; this research will also make it possible to understand the reasons why Blue Whales are attracted to certain locations. It is being conducted to meet both objective 1 of the recovery strategy and the Schedule of Studies to identify critical habitat included in the recovery strategy. The studies on high-concentration areas and their characteristics, such as high concentrations of krill, could lead to the identification of Blue Whale critical habitat, at least partially, in an update of the recovery strategy.

**Objective 2. Mitigate threats (measures 7 to 10):** DFO will implement conservation measures to protect the Blue Whale's food resources, mitigate the risk of collisions, and protect the Blue Whale from disturbances through policies and regulations.

**Objective 3. Develop a better understanding of threats (measures 4 to 6):** The impact of threats, such as noise, disturbance, or entanglement, which can alter Blue Whale behaviour and thereby adversely affect their recovery, are still poorly understood. Studies on noise sources

and the impact of disturbance and entanglement on the recovery of the population will make it possible to implement suitable mitigation measures and improve on existing mitigation measures.

The measures presented in table 1 are in addition to the implementation of those that fall under DFO's mandate and its enforcement of laws in effect. The Blue Whale is protected under SARA, which prohibits anyone from killing, harming, harassing, capturing, or taking an endangered species. Needs of the Blue Whale must also be taken into account in environmental assessments of various projects under the *Fisheries Act*, the *Impact Assessment Act* or the *Canadian Energy Regulator Act*. Mitigation measures can also be included in authorization conditions issued under various types of legislation enforced by the Department. Environmental assessments of projects submitted to federal-provincial offshore petroleum boards are also reviewed by DFO to ensure that species at risk are taken into account. Moreover, scientific research protocols on the Blue Whale are reviewed to minimize disturbances. By enforcing legislation, other government departments and agencies also contribute to Blue Whale recovery. For example, the Parks Canada Agency (PCA) is implementing the *Marine Activities in the Saguenay–St. Lawrence Marine Park Regulations*. Other Government of Canada efforts that may indirectly address threats to the Blue Whale include shipping lane speed reductions and fishery closures in key areas of the Gulf of St. Lawrence. The Blue Whale may also benefit from investments made under [Canada's Oceans Protection Plan](#), in areas that aim at a better understanding of noise impacts on whales, and at testing whale detection technologies. Lastly, efforts to survey the North Atlantic Right Whale have generated a number of Blue Whale detections, which may help with understanding seasonal Blue Whale distribution.

**Table 1. Measures to be undertaken by Fisheries and Oceans Canada (DFO)**

#	Recovery measures	Broad strategy	Priority <sup>1</sup>	Threats or objectives addressed <sup>2</sup>	Timeline
1	Continue delineating high-density seasonal areas in Canadian waters using satellite transmitters, especially in southwestern Newfoundland and on the Scotian Shelf. Transmitters have been put on several Blue Whales since 2010 and data have been used to define feeding areas and migratory routes. This research will identify locations where the Blue Whale is found in order to assess their numbers through targeted surveys.	Research and monitoring	High	Objective 1	Ongoing
2	Conduct targeted surveys in high-density areas to assess the population size. Once high-density areas have been identified, aerial or vessel-based surveys can focus on these areas and thereby be more effective in estimating the number of Blue Whales.	Research and monitoring	High	Objective 1	5 years
3	Assess the extent to which the biological processes (krill aggregations) and physical processes (currents, tides) affect the distribution, behaviour, and migrations of the Blue Whale.	Research and monitoring	High	Objective 1	5 years
4	Study the Blue Whale's behavioural responses to various noise sources in various contexts. The Blue	Research and monitoring	Medium	Objective 3, noise	10 years

<sup>1</sup> Priority: Reflects the degree to which the measure contributes directly to the recovery of the population or is an essential precursor to a measure that contributes to the recovery of the population.

- “high” priority measures are considered those most likely to have an immediate or direct impact on the achievement of the recovery objective for the population
- “medium” priority measures may have a less immediate or direct impact on the achievement of the population and distribution recovery objectives, but are still important for the recovery of the population
- “low” priority recovery measures will likely have an indirect or gradual impact on the achievement of the recovery objectives. They are nonetheless considered important contributions to the knowledge base or public involvement and to the value the public ascribes to the species

<sup>2</sup> Threats or objectives addressed: Indicates which recovery objective the measure addresses or which threat it mitigates. Summary of the objectives: objective 1: increase knowledge of the population and its size; objective 2: mitigate threats; objective 3: develop a better understanding of threats.

#	Recovery measures	Broad strategy	Priority <sup>1</sup>	Threats or objectives addressed <sup>2</sup>	Timeline
	Whale's tolerance to noise must be better understood in order to develop appropriate mitigation measures for noise-generating human activities.				
5	Study the behavioural response of Blue Whales to various approach distances of boats (whale watching, research, and recreational boats). This knowledge will help to establish acceptable approach distances for the Blue Whale.	Research and monitoring	Medium	Objective 3, disturbance	2 years
6	Assess the fishing effort and characterize the fishing gear used in areas occupied by the Blue Whale to determine the potential impact of the threat of gear entanglement on the population.	Research and monitoring	Low	Objective 3, entanglement	10 years
7	Assess whether any commercial fishery of krill would affect the integrity of the ecosystem or the energy needs of a recovering or a recovered Blue Whale population, in accordance with the <a href="#">Policy on New Fisheries on Forage Species</a> .	Conservation	High	Objective 2, availability of food	Ongoing
8	Implement the amendments to the <i>Marine Mammal Regulations</i> to help protect the Blue Whale from anthropogenic disturbances in all of the areas that they occupy. The amended regulations include approach distances for species at risk like the Blue Whale in order to reduce disturbance.	Conservation	High	Objective 2, disturbance, collisions	Ongoing
9	Determine the best management tools for achieving the St. Lawrence Estuary Area of Interest's conservation objectives and implement them, including the designation of a marine protected area.	Conservation	High	Objective 2	5 years
10	By enacting regulations, designate a marine protected area in the American Bank area located off the Gaspé Peninsula. This site is, among other things, considered as a high-density Blue Whale area. Examples of potential conservation measures would be voluntary	Conservation	Medium	Objective 2, disturbance, entanglement, collisions	Complete. Designated by Regulations on March 6, 2019

#	Recovery measures	Broad strategy	Priority <sup>1</sup>	Threats or objectives addressed <sup>2</sup>	Timeline
	measures and rules of ethics to regulate marine observation activities and reduce disturbances, as well as apply fishery measures aimed at protecting forage species, such as krill, the Blue Whale's main prey.				
11	Encourage the whale watching public to report their observations. For example, report blue whale sightings in waters off Nova Scotia, Prince Edward Island, New Brunswick and in the Gulf of St. Lawrence area to the Maritimes Region Whale Sightings Database ( <a href="mailto:xmarwhalesighting@dfo-mpo.gc.ca">xmarwhalesighting@dfo-mpo.gc.ca</a> ; 1-844-800-8568), a DFO database for opportunistic sightings of cetaceans ( <a href="http://www.inter.dfo-mpo.gc.ca/Maritimes/SABS/popec/sara/Database">http://www.inter.dfo-mpo.gc.ca/Maritimes/SABS/popec/sara/Database</a> ). The "Tell Jack" outreach campaign encourages the whale watching public in Newfoundland and Labrador to play a role in DFO marine mammal science and promote DFO's research on marine mammals including the Blue Whale. Anecdotal reports and pictures sent to the marine mammal research group ( <a href="mailto:telljack@dfo-mpo.gc.ca">telljack@dfo-mpo.gc.ca</a> ; 1-709-772-2295) can provide useful information. The campaign uses social media, proactive media relations, and public outreach activities to solicit observation reports and pictures from the public via Twitter and email.	Outreach	Medium	Objective 1	Ongoing
12	Carry out outreach and educational activities intended for whale watching operators, the whale watching public, and other mariners about best practices for observing marine mammals including the Blue Whale. For example, in Newfoundland and Labrador, school visits and public events such as Oceans Day are organized using life-size Blue Whale tails made of fabric. The tails could be used to educate people on the Blue Whale's biology, behaviour, and lifecycle, as well as its SARA status.	Outreach	Medium	Objective 2, disturbance	Ongoing

Table 2 shows the actions that will be taken by DFO and its partners working in collaboration. The order in which partners are listed in the table is not indicative of their contribution or degree of involvement. Implementation of these measures will be dependent on a collaborative approach, in which DFO is a partner in recovery efforts, but cannot implement the measures alone. Table 2 presents research and monitoring measures that are underway or to be implemented by DFO in close partnership with universities, other government agencies, the private sector and research organizations. The purpose of these measures is to:

1. continue the characterization of noise sources, levels and exposure to noise by the Blue Whale in areas they use the most (measure 13)
2. study the Blue Whale's primary food source, krill (measures 14 to 16); DFO intends to continue its research on krill production in the Estuary and Gulf of St. Lawrence, and on the interaction between krill and Blue Whales, in collaboration with universities
3. increase knowledge on Blue whale distribution in areas outside the Estuary and Gulf of St. Lawrence, for which few observational data are available (measures 17 to 22); DFO and several partners intend to use hydroacoustics and photo-identification for this purpose (these measures also support the Schedule of Studies intended to identify critical habitat set out in the recovery strategy)
4. better assess the effect of the threat of entanglement on the health and recovery of the Blue Whale (measure 23)

This table also proposes several partnerships to implement the conservation measures and thereby mitigate threats to Blue Whale recovery. Certain initiatives to mitigate threats are underway or are planned for the near future, such as noise (measure 24), toxic spills (measure 25), vessel collisions (measures 26 and 27) and entanglements (measure 28). Two awareness campaigns are also underway to improve the data collected by observers (measure 29) and to raise awareness among pleasure boaters around the Saguenay–St. Lawrence Marine Park in order to reduce disturbances in this important area for the Blue Whale (measure 30).

**Table 2. Collaborative measures to be undertaken between Fisheries and Oceans Canada (DFO) and its partners.**

#	Recovery measures	Broad strategy	Priority <sup>3</sup>	Threats or objectives addressed <sup>4</sup>	Timeline	Partnerships <sup>5</sup>
13	Continue characterizing noise sources and levels and analyzing the exposure of Blue Whales to noise in the areas they use most often in Canadian Atlantic waters.	Research and monitoring	Medium	Objective 3, noise	Ongoing and to continue from 2020 to 2030	DFO, TC, industry
14	Study krill distribution, population dynamics and production processes. Tides, currents, and krill behaviour will determine the aggregation areas essential for effective Blue Whale feeding. A better understanding of these factors could be integrated into critical habitat identification.	Research and monitoring	High	Objective 3, availability of food	3 years	DFO, universities, research institutions
15	Study energy needs of the Blue Whale to estimate the krill biomass necessary to support a recovered population.	Research and monitoring	High	Objective 3, availability of food	Ongoing	DFO, universities, research institutions
16	Study the trophic interactions between the Blue Whale and krill to try to explain the high inter-annual and inter-regional variability of Blue Whale occurrences and residence time.	Research and monitoring	High	Objective 3, availability of food	3 years	DFO, universities, research institutions
17	Use hydroacoustic techniques to monitor the seasonal occurrence of Blue Whales in Atlantic Canada's waters, especially on the Scotian Shelf and south of Newfoundland. Bottom-moored recorders will make it possible to collect data on all marine mammal species that vocalize in a specific location.	Research and monitoring	High	Objective 1	5 years	DFO, universities, research institutions

<sup>3</sup> See footnote 1 p. 5<sup>4</sup> See footnote 2 p. 5<sup>5</sup> Potential partners: Université du Québec à Rimouski, Dalhousie University, Institut des sciences de la mer à Rimouski, Group for Research and Education on Marine Mammals (GREMM), Mingan Island Cetacean Study, Réseau d'observation de mammifères marins, Indigenous groups, Shipping Federation of Canada, whale watching tour operators, emergency response networks, etc.

#	Recovery measures	Broad strategy	Priority <sup>3</sup>	Threats or objectives addressed <sup>4</sup>	Timeline	Partnerships <sup>5</sup>
18	Acquire data on Blue Whale distribution and abundance outside the Gulf of St. Lawrence (Cabot Strait and Scotian Shelf) where very little information is available, using photo-identification and the installation of satellite transmitters.	Research and monitoring	High	Objective 1	5 years	Non-governmental organizations (NGO), DFO, universities
19	Conduct necropsies on dead Blue Whales whenever possible and follow protocols for data collection and sharing.	Research and monitoring	High	Objective 1, objective 3	Ongoing	NGO, DFO, universities
20	Continue collecting tissue samples and conducting biopsies to assess the population structure, gestation rates, and level of contaminants, especially in the Gulf of St. Lawrence, the Cabot Strait and the Scotian Shelf.	Research and monitoring	Medium	Objective 1, objective 3	5 years	NGO, universities, DFO
21	Better integrate all Blue Whale sightings data collected by various sources.	Research and monitoring	Low	Objective 1	5 years	NGO, universities, research institutions, DFO
22	Establish international research partnerships to enhance understanding of Blue Whale distribution and migration routes. Sharing hydroacoustic data is an example of collaboration.	Research and monitoring	Low	Objective 1	10 years	DFO, United States National Oceanic and Atmospheric Association (NOAA), universities
23	Use photo-identification to monitor Blue Whale entanglement rates in order to better assess the impact of this threat on the health and recovery of the population.	Research and monitoring	Medium	Objective 2, entanglement	Ongoing	NGO, DFO



#	Recovery measures	Broad strategy	Priority <sup>3</sup>	Threats or objectives addressed <sup>4</sup>	Timeline	Partnerships <sup>5</sup>
24	Study and implement measures to reduce the negative impact of noise caused by human activities, such as shipping, construction, and seismic exploration.	Conservation	High	Objective 2, noise	Ongoing	DFO, TC, industry, universities, NGO, PCA
25	Develop and implement response plans to reduce impacts to Blue Whales and their habitat likely to be caused by toxic spills. The government's initiative to strengthen the tanker safety system includes improving response planning in the event of toxic spills in targeted areas such as the Gulf of St. Lawrence, a high-risk area for spill impacts.	Conservation	Medium	Objective 2, spills	5 years	Provincial and federal departments, industry, NGO
26	Maintain the Marine Mammal Response Program in the various regions of Canada's Atlantic coast. This program supports organizations that maintain call centres and databases, and that intervene when a marine mammal is in distress. It also supports training for emergency responders.	Conservation	Medium	Objective 2, entanglement, collisions	Ongoing	NGO, DFO, Indigenous groups
27	Study how to reduce the risk of vessel collisions with Blue Whales in the St. Lawrence Estuary and Gulf of St. Lawrence beyond existing voluntary measures for speed reduction, with the goal of identifying measures to implement (for example, moving shipping lanes, establishing no-go areas).	Conservation	Medium	Objective 2, collisions	3 years	DFO, TC, industry, NGO
28	Develop projects to promote the recovery of ghost or lost fishing gear in the Estuary and Gulf of St. Lawrence	Conservation	Low	Objective 2, entanglement	5 years	DFO, industry, NGO
29	Continue training observers to improve marine mammal identification and information gathering. Training is intended for those who	Outreach	Medium	Objective 1	Ongoing	DFO, NGO, industry

#	Recovery measures	Broad strategy	Priority <sup>3</sup>	Threats or objectives addressed <sup>4</sup>	Timeline	Partnerships <sup>5</sup>
	have the opportunity to gather observational information (researchers, bird watchers, observers on platforms).					
30	Educate pleasure boaters and captains of whale watching excursions on the impacts their activities have on Blue Whales near the Saguenay-St. Lawrence Marine Park. In collaboration with fisheries officers, the goal of this project is to educate users on the appropriate behaviour to adopt outside the marine park. It could be extended to other areas where there is a high incidence of disturbance by pleasure boaters and whale watchers.	Outreach	Medium	Objective 2	Ongoing	DFO, PCA, NGO

As all Canadians are invited to join in supporting and implementing this action plan for the benefit of the Blue Whale and Canadian society as a whole, table 3 identifies measures likely to support the recovery of the Northwest Atlantic Blue Whale that could be taken voluntarily by other jurisdictions, institutions, groups, and individuals interested in supporting species' recovery. The order in which partners are listed in table 3 is not indicative of their contribution or degree of involvement. The research and monitoring measures presented in table 3 are activities that could be implemented by non-governmental organizations, particularly the Mingan Island Cetacean Study (MICS). These measures involve continuing Blue Whale monitoring activities through photo-identification, hydroacoustics, tissue sample collection, and biopsies (measures 31 to 36) in Canadian and international waters. Several organizations, including PCA, are already involved in efforts to raise marine user awareness of the impact their activities have on the Blue Whale, and these efforts are expected to continue (measures 37 and 38).

If your organization is interested in participating in any of these measures, please contact the Species at Risk Management Division in Quebec at [lep-sara-qc@dfo-mpo.gc.ca](mailto:lep-sara-qc@dfo-mpo.gc.ca).

**Table 3. Measures that represent opportunities for other jurisdictions, organizations or individuals to lead or participate in.**

#	Recovery measures	Broad strategy	Priority <sup>6</sup>	Threats or objectives addressed <sup>7</sup>	Partnerships <sup>8</sup>
31	Continue photo-identification activities, especially in various areas of the Gulf of St. Lawrence, and analyze photos to continue identifying individuals. These analyses help to better understand the Blue Whale's annual use of Canadian waters and assess its abundance. The continuation of these activities includes maintaining a database of observations and photos.	Research and monitoring	High	Objective 1	Non-governmental organizations (NGO), Indigenous groups
32	Conduct acoustic monitoring (recording vocals using moored recorders) in various sectors of the Gulf of St. Lawrence and Atlantic Canada that are difficult to access in order to better characterize their use by the Blue Whale.	Research and monitoring	High	Objective 1	NGO, universities, research institutions
33	Conduct an analysis of the Northwest and Northeast Atlantic photo-identification catalogues to verify whether there are connections between these two areas of the Atlantic Ocean.	Research and monitoring	Medium	Objective 1	NGO, universities, research institutions
34	Biopsy Blue Whales to monitor their contaminants levels. The accumulation of contaminants in the Blue Whale is barely known and biopsies could make it possible to identify contaminants found in tissues and monitor their evolution over time.	Research and monitoring	Medium	Objective 3, contaminants	NGO, universities, research institutions
35	Conduct genetic analyses of tissues collected from individuals that died in spring 2014 in southern Newfoundland. The comparison of these analyses with biopsies carried out across the North Atlantic will allow for a better understanding of the extent of exchange among the whales in the various regions.	Research and monitoring	Low	Objective 1	NGO, universities, research institutions

<sup>6</sup> See footnote 1 p. 5<sup>7</sup> See footnote 2 p. 5<sup>8</sup> See footnote 5 p. 9

#	Recovery measures	Broad strategy	Priority <sup>6</sup>	Threats or objectives addressed <sup>7</sup>	Partnerships <sup>8</sup>
36	Conduct a survey off Mauritania in the winter to determine whether the Northwest Atlantic Blue Whale uses the waters off West Africa to breed.	Research and monitoring	Low	Objective 1	NGO, universities, research institutions
37	Continue raising awareness among marine users of the impact their activities have on the Blue Whale (marine observation activities, commercial shipping, and pleasure boaters).	Outreach	Medium	Objective 2	PCA, TC, NGO, industry, Indigenous groups
38	Continue mandatory training for all captains and kayaking guides who conduct their activities in the Saguenay-St. Lawrence Marine Park to familiarize them with the best practices for observing marine mammals (marine park regulations, biology, and ways to diversify excursions).	Outreach	Medium	Objective 2	PCA

## 1.3 Critical habitat

Critical habitat is defined in SARA as the “...*habitat necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species*” [s. 2(1)].

Also, SARA defines habitat for aquatic species as: “... *spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced*” [s. 2(1)].

### 1.3.1 Critical habitat identification

SARA requires an action plan that includes an identification of critical habitat to the extent possible. The 2009 recovery strategy for the Northwest Atlantic Blue Whale included a Schedule of Studies to identify critical habitat. Several such studies have been carried out since the publication of the recovery strategy, and others are ongoing. These studies are summarized in the [Report on the Progress of Recovery Strategy Implementation for the Blue Whale, Northwest Atlantic population](#). The results were presented and peer-reviewed at a DFO Science Advisory Meeting in winter 2016. A Science Advisory Report was published recently (DFO 2018) and will be used to support the identification of Blue Whale critical habitat, to the extent possible in an amended recovery strategy (in development).

### 1.3.2 Activities likely to result in the destruction of critical habitat

Examples of activities likely to result in destruction of critical habitat will be included in an amended recovery strategy.

### 1.3.3 Measures to protect critical habitat

Under SARA, critical habitat must be legally protected from destruction within 180 days of being identified in a final recovery strategy or action plan. Once Blue Whale critical habitat has been identified, this will be accomplished through a SARA Critical Habitat Order made under subsections 58(4) and (5), which will invoke the prohibition in subsection 58(1) against the destruction of the identified critical habitat.

If applicable, for those portions of critical habitat located within a national park, marine protected area, migratory bird sanctuary, or national wildlife area, a description of the critical habitat will be published in the Canada Gazette pursuant to subsection 58(2). Ninety days following publication in the Canada Gazette, the subsection 58(1) prohibition against destroying critical habitat will apply to those portions of critical habitat.

## 2 Socioeconomic assessment

SARA requires that an action plan include an assessment of the associated socioeconomic costs and the benefits to be derived from its implementation (SARA 49(1)(e), 2002). This assessment addresses only the incremental (new) socioeconomic costs associated with the implementation of this action plan at the national level, as well as the social and environmental benefits of implementing it in its entirety, recognizing that not all aspects of its implementation

are under the jurisdiction of the federal government. It is intended to inform the public and guide partners in their decision-making on the implementation of the action plan.

The assessment identifies the anticipated socio-economic impacts associated with the proposed measures listed in tables 1, 2 and 3. The evaluation only considers costs and benefits which are incremental to the baseline (for example, costs/benefits associated with new activities or enhancements to existing activities that are above-and-beyond what is part of current practice or formal commitments). Costs and benefits that are reasonably expected to occur are identified qualitatively, while those of a highly speculative or uncertain nature are not.

This assessment will first identify the main stakeholders that could be affected by or involved in the implementation of the recovery measures listed in tables 1 to 3 of the action plan. Section 2.2 then examines whether these measures could involve incremental costs to stakeholders. Lastly, section 2.3 presents an overview of the benefits of implementing the action plan.

## **2.1 Stakeholder profile**

The Blue Whale recovery measures set out in tables 1 to 3 are grouped into three types of broad strategies: research and monitoring, conservation, and outreach. The types of stakeholders that would take part in the implementation of the action plan are also identified in these tables.

### Research and monitoring

DFO's main partners in carrying out the research and monitoring activities are universities (for example, University of Quebec at Rimouski, Dalhousie University), government (for example, TC) and non-government organizations (for example, Mingan Island Cetacean Study).

### Conservation

Implementation of the conservation measures would involve a number of stakeholders, including the federal and provincial governments, non-governmental organizations, and the private sector. Several private sector industries could be affected by the implementation of conservation measures. In particular, noise reduction measures could have repercussions for industries whose activities involve shipping, marine construction, and seismic exploration (table 2, measure 24). Initiatives to enhance the security systems of tankers and reduce the risk of collision between Blue Whales and ships may also have an impact on the shipping industry (table 2, measures 25 and 27).

### Outreach

Outreach activities would be conducted primarily by the federal government in collaboration with non-governmental organizations and the whale watching industry.

## **2.2 Socioeconomic costs of implementing the action plan**

Many of the recovery measures identified in this action plan represent a continuation of current activities or responsibilities and commitments of DFO and/or other groups into the foreseeable future, and are noted as being underway. Unless there is an indication that these activities would cease in the absence of this action plan they are considered to be a continuation of the

baseline. Although the measures set out in the action plan could affect some stakeholders identified above, their implementation would not systematically result in incremental socioeconomic costs to these stakeholders.

For the majority of the measures identified, insufficient information is available at this time to provide a quantitative assessment of potential costs of implementation. As a result, the overall magnitude of the investment that would be required to fully implement this plan is largely unknown at the present time, and potential costs of the action plan are evaluated qualitatively, where possible.

### Research and monitoring

Of the 38 recovery measures in the action plan, 23 measures involve research and monitoring activities. Many of these research projects are an extension of projects already being carried out by DFO and its partners and are therefore considered low cost. Certain projects go beyond the scope of the Blue Whale recovery strategy and include the acquisition of knowledge that can be applied to several species, therefore costs resulting from implementation of measures are also likely to be low.

DFO-led research and monitoring is funded through the Department's regular programs, therefore incremental costs to DFO are not expected. Measures undertaken by other organizations (universities, NGOs, research institutes) are funded in part by existing federal government programs. However, additional costs could be incurred by local and regional stakeholders who become involved in Blue Whale recovery efforts. There is not enough information at this stage to quantify these costs, and they will vary depending on the nature and extent of the research activities undertaken.

### Conservation

The action plan identifies 8 conservation measures to implement mitigation and monitoring measures for activities that could disrupt the recovery of the Blue Whale in its Canadian range. As most of these measures fall within the framework of initiatives that are already underway, incremental costs associated with their implementation are expected to be low.

One of the conservation measures aimed at reducing the risk of collisions between the Blue Whale and ships in the St. Lawrence Estuary (table 2, measure 27) could lead to additional costs for the shipping industry. As details on the implementation of these measures are not known, it is not possible at this time to estimate the incremental costs, if any, to the shipping industry. The implementation of the other conservation measures is not expected to generate additional costs to the other stakeholders.

### Outreach

The awareness activities included in the action plan are all activities that are currently underway and intended to protect several species of marine mammals. Consequently, awareness activities are not expected to generate incremental costs to the federal government or stakeholders.



## 2.3 Benefits of implementing the action plan

Implementation of the measures outlined in this action plan will contribute positively towards the achievement of the long-term goal of the Northwest Atlantic Blue Whale recovery strategy, which is to reach a total of 1,000 mature individuals in the population.

Benefits of the recovery of the Blue Whale are difficult to quantify. However, the Act recognizes that “wildlife, in all its forms, has value in and of itself and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons” (SARA 2002). Self-sustaining and healthy ecosystems with their various elements in place, including species at risk, contribute positively to the livelihoods and the quality of life of all Canadians. A review of the literature confirms that Canadians value the preservation and conservation of species in and of themselves. Measures taken to preserve a species, such as habitat protection and restoration, are also valued. In addition, the more measures that are in place to contribute to the recovery of a species, result in a higher value that the public ascribes to such measures (Loomis and White 1996; DFO 2008).

Specifically, a study estimating the economic benefits of marine mammal recovery in the St. Lawrence Estuary reveals that Canadians would be willing to pay \$229 annually per household for a multi-species recovery strategy resulting in a measurable improvement in the status of species at risk for a number of marine mammals, including the Blue Whale (Boxall et al. 2012). Wildlife watching is also a popular pastime and the increased presence of Blue Whales in Canadian waters resulting from the conservation measures in the action plan will support Canada’s eco-tourism sector.

Implementation of the action plan should also generate benefits beyond the recovery of the Blue Whale. The acquisition of knowledge and the establishment and implementation of conservation measures should benefit several other marine mammal species.

## 2.4 Distributional impacts

Many different stakeholders will be involved in implementing the recommendations set out in this action plan. Given that most of the measures identified in the plan relate to existing programs and are a continuation of activities already underway, the incremental costs to DFO and its partners are expected to be minimal.

The benefits of implementing the Blue Whale action plan will be enjoyed by Canadian society as a whole, given the economic value that Canadians attach to the recovery of wildlife and the protection of its habitat, including the Blue Whale.

## 3 Measuring progress

The recovery objectives presented in the recovery strategy propose a method for defining and measuring progress made toward achieving the population and distribution objectives.

A report on the implementation of the action plan (under section 55 of SARA) will be prepared to assess the progress made towards the implementation of the recovery measures in 5 years after the posting of this action plan.

Reporting on the ecological and socio-economic impacts of the action plan (under section 55 of SARA) will be done by assessing the results of monitoring of the species' recovery and its long-term viability, and by assessing the implementation of the action plan.

## References

- Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., and J.-Y. Savaria. 2009. Recovery strategy for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada. *Species at Risk Act Recovery Strategy Series*. Fisheries and Oceans Canada, Ottawa.
- Boxall, P.C., Adamowicz, W.L., Olar, M., West, G.E., and G. Cantin. 2012. Analysis of the Economic Benefits Associated with the Recovery of Threatened Marine Mammal Species in the Canadian St. Lawrence Estuary. *Marine Policy*. 36 (1):189-197.
- Fisheries and Oceans Canada. 2008 (DFO). Estimation of the Economic Benefits of Marine Mammal Recovery in the St. Lawrence Estuary. Policy and Economics Regional Branch, Quebec 2008.
- Fisheries and Oceans Canada (DFO). 2016. Report on the Progress of Recovery Strategy Implementation for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada for the Period 2009 – 2014. *Species at Risk Act Recovery Strategy Report Series*. Fisheries and Oceans Canada, Ottawa.
- Fisheries and Oceans Canada (DFO). 2018. Identification of important habitats for the Blue Whale in the western North Atlantic. DFO Can. Sci. Advis. Sec., Sci. Advis. Rep. 2018/003.
- Gaspard, D., C. Ramp, J. Delarue, S. Landry and R. Sears. 2017. Entanglement threat has been underestimated for three rorqual species in the Gulf of St. Lawrence, Canada. Poster presented at the 22nd Biennial Conference on the Biology of Marine Mammals, October 22-27, 2017, Halifax, NS, Canada.
- Loomis, J.B., and D.S. White. 1996. Economic Benefits of Rare and Endangered Species: Summary and Meta-Analysis. *Ecological Economics*. 18: 197-206.

## Appendix A: effects on the environment and other species

A Strategic Environmental Assessment (SEA) is conducted on all *Species at Risk Act* (SARA) recovery planning documents under SARA and in accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#). The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect the environment in any way or the achievement of any of the [Federal Sustainable Development Strategy](#)'s goals or targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of action plans may inadvertently have environmental impacts beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental impacts, with a particular focus on the potential impacts on non-target species or habitats. The results of the SEA are incorporated directly into the action plan itself, but are also summarized below in this statement.

The threats affecting the Blue Whale also impact several marine mammal species that share its range. The implementation of measures aimed at reducing the impact of threats to the Blue Whale should therefore also benefit this species. Research intended to better understand krill production and behaviour could lead to conservation measures that will also be positive for all levels of the food chain.

## Appendix B: record of cooperation and consultation

Action plans are to be prepared in cooperation with other affected jurisdictions, organizations, parties or individuals, as outlined in section 48 of the *Species at Risk Act*. DFO has sought the participation of various stakeholders in developing the action plan. The expertise of the Mingan Islands Cetacean Study, which has been collecting observational data on baleen whales for more than three decades and which acts as curator of the blue whale photo-identification catalogue, was also solicited.

Targeted consultation on a draft action plan was carried out between November 2015 and spring 2016 with the governments of 5 provinces, Indigenous groups, the wildlife management boards of 2 territories, partners from industry and non-governmental organizations and the United States (U.S.) government to invite them to provide comments.

As part of the posting of the proposed action plan on the Species at Risk Public Registry, the Canadian public and all relevant stakeholders (including the shipping and fishing industries and the commercial marine life observations activities) were invited to participate in a 60-day comment period between July and September 2018. Following this public comment period, some changes were made to the action plan, particularly on how to consider the threat of entanglement, which will have to be reassessed as part of an updated recovery strategy. Changes were also made to figure 1, which describes the blue whale's range, to include the northern portion of the Gaspé Peninsula. Transport Canada has also been added as a partner in some of the actions listed in the action plan.

The stakeholders and partners who contributed to the development of the action plan are listed below. They have been grouped by sector of activity and were called upon to participate in the various stages of consultation. All comments received by these stakeholders and partners were taken into consideration when drafting the action plan.

Area of activity	Representative organization
Federal department	Fisheries and Oceans (Canadian Coast Guard)
Federal department	Parks Canada
Federal department	Transport Canada
Provincial department	Ministère des Forêts, de la Faune et des Parcs du Québec
International authority	National Oceanic and Atmospheric Administration
Indigenous groups	First Nation of Sipekne'katik
Indigenous groups	First Nation of Wolastoqiyik Wamspekwuk
Indigenous groups	The Mi'gmaq Maliseet Aboriginal Fisheries Management Association
Wildlife Management Board	Nunavut Wildlife Management Board
Wildlife Management Board	Nunavik Marine Region Wildlife Board
Stakeholders in the coastal and offshore project sector	Canada-Nova Scotia Offshore Petroleum Board
Stakeholders in the coastal and offshore project sector	Canadian Association of Petroleum Producers
Organizations with various responsibilities : <ul style="list-style-type: none"> <li>• Activities involving information and knowledge transfer to key players</li> <li>• Activities and research concerning marine mammals</li> <li>• etc.</li> </ul>	Mingan Island Cetacean Study
Organizations with various responsibilities : <ul style="list-style-type: none"> <li>• Activities involving information and knowledge transfer to key players</li> <li>• Activities and research concerning marine mammals</li> <li>• etc.</li> </ul>	New England Aquarium
Organizations with various responsibilities : <ul style="list-style-type: none"> <li>• Activities involving information and knowledge transfer to key players</li> <li>• etc.</li> </ul>	Conseil régional de l'environnement du Bas-Saint-Laurent