

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

Blue Whale, Northwest Atlantic Population



2019

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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 effective 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.

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 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 Parks Canada Agency 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 this population 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 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 Fisheries and Oceans Canada, Environment and Climate Change Canada 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* in 2005. The main threats to its recovery are anthropogenic noise, lack of food availability, contaminants, collisions, disturbances and entanglements. Published in 2009, the Recovery Strategy 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 presents 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. They consist primarily of research aimed at estimating the size of the Northwest Atlantic Blue Whale population and its use of Canadian waters. The measures also include adopting or enforcing legislation or policies to protect Blue Whale habitat and mitigate threats. The second set of measures will be implemented by the Department in partnership with the various stakeholders involved in the Blue Whale's recovery. They include research on krill and the use of hydroacoustics to document the presence of these whales. The third set of measures consists of actions that concerned stakeholders will be able to take voluntarily. They include observations and photo-identification of Blue Whales and outreach and awareness initiatives.

The measures set out in the Action Plan could affect some stakeholders such as non-governmental organizations or the shipping industry. However, their implementation would not necessarily result in incremental costs to these stakeholders. Canadian society as a whole would benefit from the implementation of the Action Plan, given the economic value that Canadians attach to the recovery of the species and the protection of its habitat.

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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. 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 status confirmed. It was listed as Endangered under the *Species at Risk Act* (SARA) in January 2005. Commercial whaling historically carried out 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. 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 [Recovery Strategy for the Northwest Atlantic Blue Whale](#) (Beauchamp et al. 2009) presents the various threats facing the population. 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. This 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 thought. Given the small size of the Blue Whale population, even activities that affect a small number of individuals can have a significant impact on the species' survival in the Atlantic Ocean.

The long-term goal of this 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 is proposing recovery approaches based on three broad strategies: research and monitoring, conservation, 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 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, on studies to identify their critical habitat, and on 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.

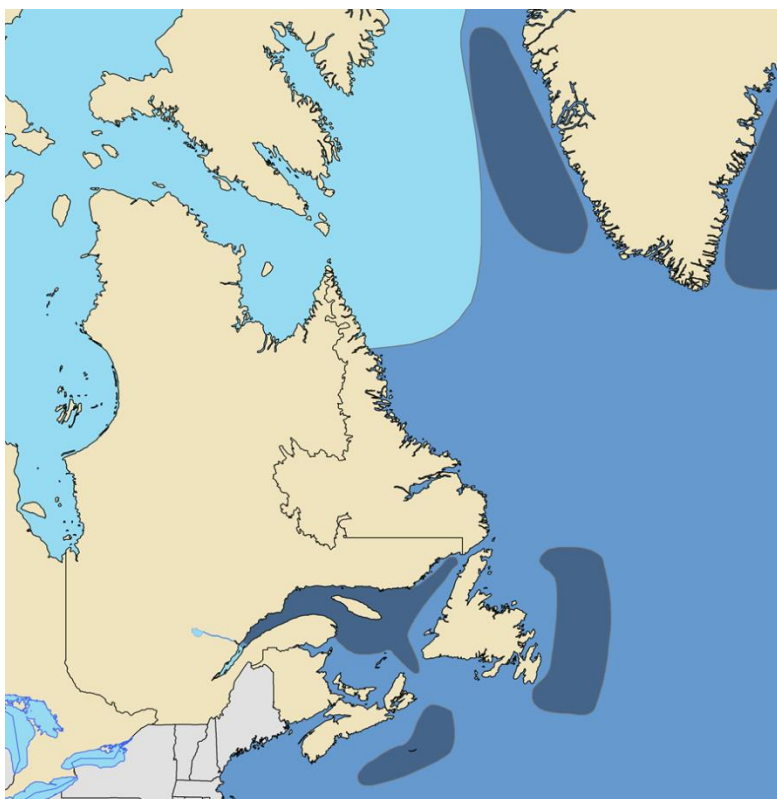


Figure 1. Geographic range and concentration areas (darker blue) of the Blue Whale in the Northwest Atlantic Ocean.

1.2 Measures to be taken and Implementation Schedule

Success in the 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 actions set out in this Action Plan.

This Action Plan outlines 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 in 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 field 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 medium term (within the next 5 to 10 years). These measures are technically and financially feasible and will help identify 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. Implementation Schedule: Measures to be undertaken by Fisheries and Oceans Canada

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 have to be led by DFO, particularly because of 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](#) (Fisheries and Oceans Canada 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): Fisheries and Oceans Canada will also 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 the behaviour of Blue Whales 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 DFO's mandate and enforcement of laws in effect. The Blue Whale is protected under SARA, which prohibits anyone from harming or harassing an endangered species. The Blue Whale's needs must also be taken into account in the environmental assessments of various projects under the *Fisheries Act*, the *Canadian Environmental Assessment Act*,

2012 or the *National Energy Board 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, Parks Canada is implementing the *Marine Activities in the Saguenay–St. Lawrence Marine Park Regulations*.

Table 1. Measures to be undertaken by Fisheries and Oceans Canada

#	Recovery Measures	Priority ¹	Threats or Objectives Addressed ²	Timeline
Broad Strategy: <i>Research and monitoring</i>				
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.	High	Objective 1	5 years
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.	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.	High	Objective 1	5 years

¹ **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.

² **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	Priority ¹	Threats or Objectives Addressed ²	Timeline
4	Study the Blue Whale's behavioural responses to various noise sources in various contexts. The Blue Whale's tolerance to noise must be better understood in order to develop appropriate mitigation measures for noise-generating human activities.	Medium	Objective 3 Noise	10 years
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.	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.	Low	Objective 3 Entanglement	10 years
Broad Strategy: Conservation				
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 Policy on New Fisheries on Forage Species .	High	Objective 2 Availability of food	Ongoing
8	Adopt and 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.	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.	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 measures and rules of ethics to regulate marine observation activities and reduce disturbances, as well as	Medium	Objective 2 Disturbance Entanglement	2 years

#	Recovery Measures	Priority ¹	Threats or Objectives Addressed ²	Timeline
	apply fishery measures aimed at protecting forage species, such as krill, the Blue Whale's main prey.		Collisions	
Broad Strategy: Outreach				
11	Encourage the whale watching public to report their observations. For example, 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 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.	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.	Medium	Objective 2 Disturbance	Ongoing

Table 2. Measures to be undertaken collaboratively between Fisheries and Oceans Canada and its partners

Table 2 shows the actions that will be taken by Fisheries and Oceans Canada 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 Fisheries and Oceans Canada is a partner in recovery efforts, but cannot implement the measures alone. Table 2 presents research and monitoring measures that DFO is implementing 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 and levels and the Blue Whale's exposure to noise in the 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 krill interaction with Blue Whales, in collaboration with universities.
3. Increase knowledge of the 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 conservation measures and thereby mitigate threats to Blue Whale recovery. Certain initiatives are underway or are planned for the near future to mitigate threats, 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 between Fisheries and Oceans Canada and its partners.

Acronyms: DFO (Fisheries and Oceans Canada), NGO (Non-Governmental Organizations), NOAA (National Oceanographic and Atmospheric Administration, US).

#	Recovery Measures	Priority ³	Threats or Objectives Addressed ⁴	Timeline	Partnerships ⁵
Broad Strategy: <i>Research and monitoring</i>					
13	Continue characterizing of noise sources and levels, and analyzing the exposure of Blue Whales to noise in the areas they use most often in Canadian Atlantic waters.	Medium	Objective 3 Noise	Ten years	DFO Transport Canada 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.	High	Objective 3 Availability of food	3 years	DFO Universities Research institutes
15	Study the Blue Whale's energy needs to estimate the krill biomass necessary to support the current population and eventually a recovering population.	High	Objective 3 Availability of food	3 years	DFO Universities Research institutes
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.	High	Objective 3 Availability of food	3 years	DFO Universities Research institutes

³ See footnote 1.

⁴ See footnote 2.

⁵ **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 des mammifères marins, Indigenous groups, Shipping Federation of Canada, whale watching tour operators, emergency response networks, etc.

#	Recovery Measures	Priority ³	Threats or Objectives Addressed ⁴	Timeline	Partnerships ⁵
17	Use hydroacoustic techniques to monitor the occurrence and number 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.	High	Objective 1	2 to 5 years	DFO Universities Research institutes
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.	High	Objective 1	5 years	NGO DFO Universities
19	Conduct necropsy on dead Blue Whales whenever possible and follow protocols for data collection and sharing.	High	Objective 1 Objective 3	Ongoing	NGO DFO Universities
20	Continue collecting tissue samples and conducting biopsies to assess the population structure, pregnancy rates, and level of contaminants, especially in the Gulf of St. Lawrence, the Cabot Strait and the Scotian Shelf.	Medium	Objective 1 Objective 3	5 years	NGO Universities DFO
21	Better integrate all Blue Whale sightings data collected by various sources.	Low	Objective 1	5 years	NGO Universities Research institutes DFO
22	Establish international research partnerships to increase understanding of the Blue Whale's distribution and migration routes. Sharing hydroacoustic data is an example of collaboration.	Low	Objective 1	10 years	DFO NOAA Universities

#	Recovery Measures	Priority ³	Threats or Objectives Addressed ⁴	Timeline	Partnerships ⁵
23	Use photo-identification to monitor entanglement rates in Blue Whales in order to better assess the impact of this threat on the health and recovery of the population.	Medium	Objective 2 Entanglement	In progress	NGO DFO
Broad Strategy: Conservation					
24	Study and implement measures to reduce the negative impact of noise caused by human activities, such as shipping, construction, and seismic exploration.	High	Objective 2 Noise	Ongoing	DFO Transport Canada Industry Parks Canada Universities NGO
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.	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.	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 (e.g., moving shipping lanes, establishing no-go areas).	Medium	Objective 2 Collisions	5 years	DFO Transport Canada Industry NGO

#	Recovery Measures	Priority ³	Threats or Objectives Addressed ⁴	Timeline	Partnerships ⁵
28	Develop projects to promote the recovery of ghost or lost fishing gear in the Estuary and Gulf of St. Lawrence	Low	Objective 2 Entanglement	5 years	DFO Industry NGO
Broad Strategy: Outreach					
29	Continue training observers to improve marine mammal identification and information gathering. Training is intended for all those who have the opportunity to gather observational information (researchers, bird watchers, observers on platforms).	Medium	Objective 1	Ongoing	DFO NGO Industry
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.	Medium	Objective 2	5 years	DFO Parks Canada NGO

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

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 the 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 Parks Canada, 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 one of these measures, please contact the Species at Risk Management Division in Quebec at lep-sara-qc@dfo-mpo.gc.ca.

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

#	Recovery Measures	Priority ⁶	Threats or objectives addressed ⁷	Partnerships ⁸
Broad Strategy: Research and monitoring				
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 implies maintaining a database of observations and photos.	High	Objective 1	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.	High	Objective 1	NGO Universities Research institutes
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.	Medium	Objective 1	NGO Universities Research institutes
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.	Medium	Objective 3 Contaminants	NGO Universities Research institutes
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.	Low	Objective 1	NGO Universities Research institutes

⁶ See footnote 1.⁷ See footnote 2.⁸ See footnote 5.

#	Recovery Measures	Priority ⁶	Threats or objectives addressed ⁷	Partnerships ⁸
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.	Low	Objective 1	NGO Universities Research institutes
Broad Strategy: Outreach				
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).	Medium	Objective 2	Parks Canada Transport Canada 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).	Medium	Objective 2	Parks Canada

1.3 Critical habitat

1.3.1 Critical habitat identification

The Act requires an action plan which or that includes an identification of critical habitat to the extent possible. When published in 2009, the 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 (Fisheries and Oceans Canada 2018) and will be used to support the identification of Blue Whale critical habitat, to the extent possible. This identification will be presented in an update of the Recovery Strategy, rather than in this Action Plan.

2. Socioeconomic assessment

The *Species at Risk Act* requires that an Action Plan include an assessment of the socioeconomic costs associated with its implementation and of the benefits to be derived from the 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.

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 (e.g., University of Quebec at Rimouski, Dalhousie University), governmental (e.g., Transport Canada) and non-governmental (e.g., Mingan Island Cetacean Study) organizations.

Conservation

The implementation of 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 measures identified in the Action Plan are initiatives underway within the federal government and its partners, and these measures are expected to continue even in the absence of the Action Plan. 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.

There is not enough information to quantify the incremental socioeconomic costs that could result from implementing the Action Plan for the Blue Whale. Therefore, the potential costs of the Action Plan are evaluated qualitatively because most of the available information is qualitative.

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. 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. It is therefore realistic to think that many of the research activities listed in Tables 1 to 3 would be carried out by DFO and its partners, even in the absence of the Action Plan.

DFO-led research and monitoring would be funded through the Department's regular programs and would not mean incremental costs to DFO. Measures undertaken by other organizations (universities, NGOs, research institutes) could be funded in part by existing federal government programs. However, additional costs could be incurred by local and regional stakeholders who chose to become involved in Blue Whale recovery efforts.

There is not enough information at this stage to quantify these costs, but they would vary depending on the extent of the research activities undertaken.

Conservation

The Action Plan identifies eight conservation measures to implement mitigation and monitoring measures for activities that could disrupt the recovery of the Blue Whale in its Canadian range. Most of these measures fall within the framework of initiatives that are already underway within the federal government; the implementation of these measures therefore will not involve any incremental costs to the government.

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 to estimate the incremental costs, if any, to the shipping industry.

The implementation of conservation measures is not expected to generate any additional costs to the other stakeholders.

Outreach

The awareness activities included in the Action Plan are all activities that are currently underway and are intended to protect several species of marine mammals. Therefore, realistically, these activities would be carried out even in the absence of the Action Plan for the Blue Whale. Consequently, awareness activities are not expected to generate incremental costs to the federal government or any of the stakeholders.

2.3 Benefits of implementing the Action Plan

The implementation of the measures outlined in this Action Plan will contribute positively to 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.

The 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 contribute to the recovery of a species, the higher the value the public ascribes to such measures (Loomis and White 1996; Fisheries and Oceans Canada 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).

The implementation of the Action Plan should also generate benefits beyond the recovery of the Blue Whale. The acquisition of knowledge and the development 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 set out in the plan relate to existing programs and are a continuation of activities already underway, the incremental costs to DFO and its partners should be minimal.

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

3. Measuring progress

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

A report on the implementation of the Action Plan (under s. 55 of SARA) will be prepared to assess the progress made towards the implementation of the recovery measures.

A report on the ecological and socioeconomic impacts of the Action Plan (under s. 55 of SARA) will be prepared to provide information on the monitoring of the species' recovery and its long term viability, and on the implementation of the Action Plan.

4. References

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Appendix A: Effects on the environment and other species

A Strategic Environmental Assessment (SEA) is conducted on all 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 an 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 weigh on several marine mammal species that share its range. Measures aimed at reducing the impact of threats to the Blue Whale should therefore also benefit these species. Research intended to better understand krill production and behaviour and could lead to conservation measures will also be positive for all levels of the food chain.

Appendix B: Record of cooperation and consultation

This document was prepared with the participation of DFO researchers working on the Blue Whale. Representatives of the Saguenay-St. Lawrence Marine Park also participated, because the species is often present within its boundaries. The expertise of the Mingan Island Cetacean Study, which has been collecting observational data on whales for over three decades and which acts as curator of the Blue Whale photo-identification catalogue, was also solicited.

The document has been reviewed by the different divisions in the five relevant DFO administrative regions and by national headquarters. It was also sent for comment to provincial governments and Indigenous groups present within the range of this Blue Whale population. The non-governmental organizations, the shipping and fishing industries and the commercial marine life observations activities were also consulted.