

# Action Plan for the Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary Population in Canada

## The Beluga Whale



2025

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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 report, and other related recovery documents, please visit the [Species at Risk Public Registry](#).

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## Statement on the Government of Canada's Beluga Whale (St. Lawrence Estuary Population) initiatives

The Government of Canada has demonstrated its commitment to the protection and recovery of the Beluga Whale, St. Lawrence Estuary (SLE) population, through several investments in recent years. In 2016, the Government of Canada announced a \$1.5 billion investment as part of the Oceans Protection Plan, which includes measures to address threats to marine mammals in Canadian waters. Budget 2018 included \$167.4 million over 5 years to help protect and recover endangered cetacean species in Canada, specifically the SLE Beluga, as well as the North Atlantic Right Whale and the Southern Resident Killer Whale. This includes funding for science activities to help better understand factors affecting the health of these cetacean populations, as well as actions to help address the threats arising from human activities and enhance incident response capacity. Budget 2023 provides \$151.9 million over 3 years to federal departments to continue the implementation of actions to protect endangered cetaceans and their habitat. This commitment will allow the renewal of targeted actions for SLE Beluga over the next 3 years for Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada (ECCC), Parks Canada (PC), and Transport Canada (TC). It will ensure continued funding for research and monitoring to better understand feeding behaviour, prey quality and abundance, and the threat of priority contaminants that pose a risk to the health of SLE Beluga and their prey and their habitat quality.

More information on the Government of Canada's work to monitor the recovery of SLE Beluga Whale and reduce threats to them in Canadian waters can be found at these links:

- [Canadian Science Advisory Secretariat](#)
- [Beluga Whale, St. Lawrence Estuary population profile](#)
- [The Marine Mammal Regulations in Canada](#)
- [Rules of Navigation around Beluga Whales in the St. Lawrence Estuary and Saguenay River](#)
- [Sharing the waters with Belugas](#)
- [Modifications to Saguenay–St. Lawrence Marine Park Regulations](#)
- [Review of the Effectiveness of Recovery Measures for St. Lawrence Estuary Beluga](#)
- [The beluga whale will benefit from additional protection in the Upper Estuary](#)
- [Parks Canada enhances beluga protection in the Saguenay–St. Lawrence Marine Park with the establishment of a temporary exclusion area at Baie Sainte-Marguerite](#)

## Preface

Under the [Accord for the Protection of Species at Risk \(1996\)](#)<sup>1</sup>, federal, provincial, and territorial government signatories agreed to establish complementary legislation and programs that will ensure the protection of species at risk in Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as extirpated, endangered, or threatened for which recovery has been deemed feasible. They are also required to report on progress 5 years after the publication of the final document on the [Species at Risk Public Registry](#).

The Minister of Fisheries is the competent minister under SARA for the Beluga Whale, St. Lawrence Estuary (SLE) population and has prepared this action plan based on the recovery strategy, as per section 47 of SARA. In preparing this action plan, the competent minister has considered, as per section 38 of SARA, the commitment of the Government of Canada to conserving biological diversity and to the following principle: 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 other federal departments, Indigenous Peoples, the Government of Quebec, academic partners, and non-governmental organizations as per subsection 48(1) of SARA. The complete list of partners can be found in appendix B.

As stated in the preamble to SARA, success in the recovery of this population depends on the commitment and cooperation of many different groups that will be involved in implementing the directions and actions set out in this action plan. This success cannot be achieved solely by Fisheries and Oceans Canada (DFO), or any other jurisdiction alone. The cost of conserving species at risk is shared amongst different contributors. Canadians are invited to join in supporting and implementing this action plan for the benefit of the SLE Beluga and Canadian society as a whole.

Under SARA, an action plan provides 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 and/or organizations to help achieve the population size and distribution objectives identified in the recovery strategy. Implementation of this action plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

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<sup>1</sup> The Government of Quebec has not signed the Accord for the Protection of Species at Risk of 1996. In addition, the Canada-Quebec Accord for the Protection of Species at Risk expired on March 31, 2022.

## **Acknowledgments**

This action plan was prepared by Charline Le Mer, E. Laurence Forget-Lacoursière, Virginie Christopherson, Ali Magassouba, and Véronique Lesage of DFO. To the extent possible, this action plan has been prepared with inputs from other federal government departments and agencies, Indigenous Peoples, non-governmental organizations, and academic partners.

The department would also like to express its appreciation to all individuals and organizations who have contributed to the recovery of the SLE Beluga, especially all those who participated in the workshops held in the fall of 2020 to discuss the recovery actions contained in this action plan, as well as all those who provided input during the various stages of the writing process.

## Executive summary

The Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary (SLE) population in Canada, was listed as threatened under the *Species at Risk Act* (SARA) in 2005. Following a reassessment of the status of the population in 2014 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), its status was changed to endangered in Schedule 1 of SARA in 2017. This “Action Plan for the Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary Population in Canada” (action plan) is part of a series of documents dedicated to this population that should be considered as a whole, including COSEWIC status reports (Pippard 1985; Lesage and Kingsley 1998; COSEWIC 2004; COSEWIC 2014), the science advisory report from the recovery potential assessment (DFO 2005), the recovery strategy (DFO 2012), the noise reduction action plan (DFO 2020), and all recovery strategy implementation documents.

Beluga Whales are toothed whales belonging to the Odontoceti sub-order. The SLE population is located at the southernmost limit of the species’ global distribution, which is predominantly Arctic. This population is therefore geographically and reproductively isolated from other Beluga populations (COSEWIC 2014; Skovrind et al. 2021).

The main threats to the SLE population are described in the recovery strategy published in 2012 (section 1.5) and include underwater noise and anthropogenic disturbance; reduced prey abundance, availability, and quality; contaminants and accidental spills of toxic substances; collisions and entanglements; habitat degradation; and certain biological threats, such as toxic algal blooms. Note that the threat of underwater noise will not be addressed in this document since it was the subject of a specific action plan on Belugas, and other marine mammals at risk in the Estuary (DFO 2020).

The SLE Beluga recovery strategy, published in 2012, proposes 6 recovery objectives to better understand the population, its habitat and the threats it faces; and to implement measures to mitigate these threats.

This action plan outlines 47 measures to be implemented in the short and medium term to deepen our knowledge and mitigate threats to the population, monitor its recovery, and promote public awareness.

Critical habitat for the SLE Beluga was identified using the best available information at the time of its identification, and it provides the functions, features, and attributes necessary to support the population’s lifecycle processes. The recovery strategy identifies critical habitat for SLE Beluga as the summer area used by groups made up of adults and newborn calves and juveniles. This habitat extends from the Upper Estuary from the Battures aux Loups Marins, the southern portion of the Lower Estuary, and the lower reaches of the Saguenay River (figure 1). Section 2 of this action plan relates to critical habitat.

An evaluation of the socio-economic impacts associated with implementing the action plan and the benefits to be derived from its implementation is provided in section 3. Many of the recovery measures included in this action plan represent the continuation into the foreseeable future of current activities, responsibilities, and commitments of DFO and other groups.

Requirements in the event of a decision to euthanize a Beluga from the SLE population, as authorized by this action plan under the exemptions set out in SARA subsection 83(4), are presented in section 5.

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# 1 Recovery actions

## 1.1 Context and scope of the action plan

The Beluga Whale (*Delphinapterus leucas*), more precisely the St. Lawrence Estuary (SLE) population in Canada, was listed as threatened under the *Species at Risk Act* (SARA) in 2005, then reassessed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2014 and listed as such under SARA in 2017. This “Action Plan for the Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary Population in Canada” (action plan) is part of a series of documents dedicated to this population that should be considered as a whole. These documents include COSEWIC status reports (Pippard 1985; Lesage and Kingsley 1998; [COSEWIC 2004](#); [COSEWIC 2014](#)), the St. Lawrence Beluga Recovery Plan (DFO and WWF 1995), science advisory reports from the recovery potential assessment ([DFO 2005](#)) as well as the assessment of abundance and population trajectory of SLE Beluga ([DFO 2023](#)), the Recovery Strategy for the Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary Population in Canada ([DFO 2012](#)), the Review of the Effectiveness of Recovery Measures for St. Lawrence Estuary Beluga ([Lesage 2017](#)), the Action Plan to Reduce the Impact of Noise on the Beluga Whale (*Delphinapterus leucas*) and Other Marine Mammals at Risk in the St. Lawrence Estuary ([DFO 2020](#)), and the Report on the Progress of Recovery Strategy Implementation for the Beluga Whale (*Delphinapterus leucas*), St. Lawrence Estuary Population in Canada, for the Period 2012 to 2019 ([DFO 2022](#)). Under SARA, an action plan provides detailed recovery planning measures that support the strategic direction set out in a recovery strategy for the population. The recovery strategy provides background information on the population, its threats, and critical habitat.

### Range and critical habitat of the Beluga

The Beluga is a toothed whale and the only representative of the genus *Delphinapterus*. The SLE population is a relict Arctic population that is genetically distinct from all other Beluga populations (COSEWIC 2014; Skovrind et al. 2021). It is located at the southern limit of the species’ distribution (DFO 2023). In summertime, these whales’ exclusive range is in the SLE and the Saguenay Fjord, while it extends eastward into the northwestern Gulf of St. Lawrence in the fall, the winter, and the spring (Mosnier et al. 2010). The Estuary provides conditions that are favourable to the Beluga’s continued presence: the upwellings of mineral-rich water that occur there support the high productivity of the environment and the cold waters favour the presence of seasonal ice cover (Mosnier et al. 2010; Galbraith et al. 2021). The oceanographic processes that create these conditions are considered crucial for maintaining the functions of a number of Beluga habitats, and thus for the survival and recovery of this population (DFO 2017). The critical habitat of the SLE Beluga was identified in the recovery strategy, based on the habitat occupied by females, juveniles, and calves between June and October. The critical habitat consists of a part of the Upper Estuary below Battures aux Loups Marins, the southern portion of the Lower Estuary as far as Saint-Simon, and the lower reaches of the Saguenay River (figure 1).

The core of the summer range is located at the confluence of the mouth of the Saguenay Fjord and the head of the Laurentian Channel, offshore from Tadoussac (DFO 2012; Ouellet et al. 2021; Simard et al. 2023). It is estimated that at least 45% of the Beluga population uses this zone, especially the vicinity of the Île Rouge where a network of travel corridors leading to various habitats converge (Ouellet et al. 2021). Research has also shown that the population’s use of its summer habitat is governed by a certain spatial structure (Bonnell et al. 2022). The

information gathered on the site fidelity existing within the population and on Beluga movements has shed new light on the effect of individual and local stress factors.

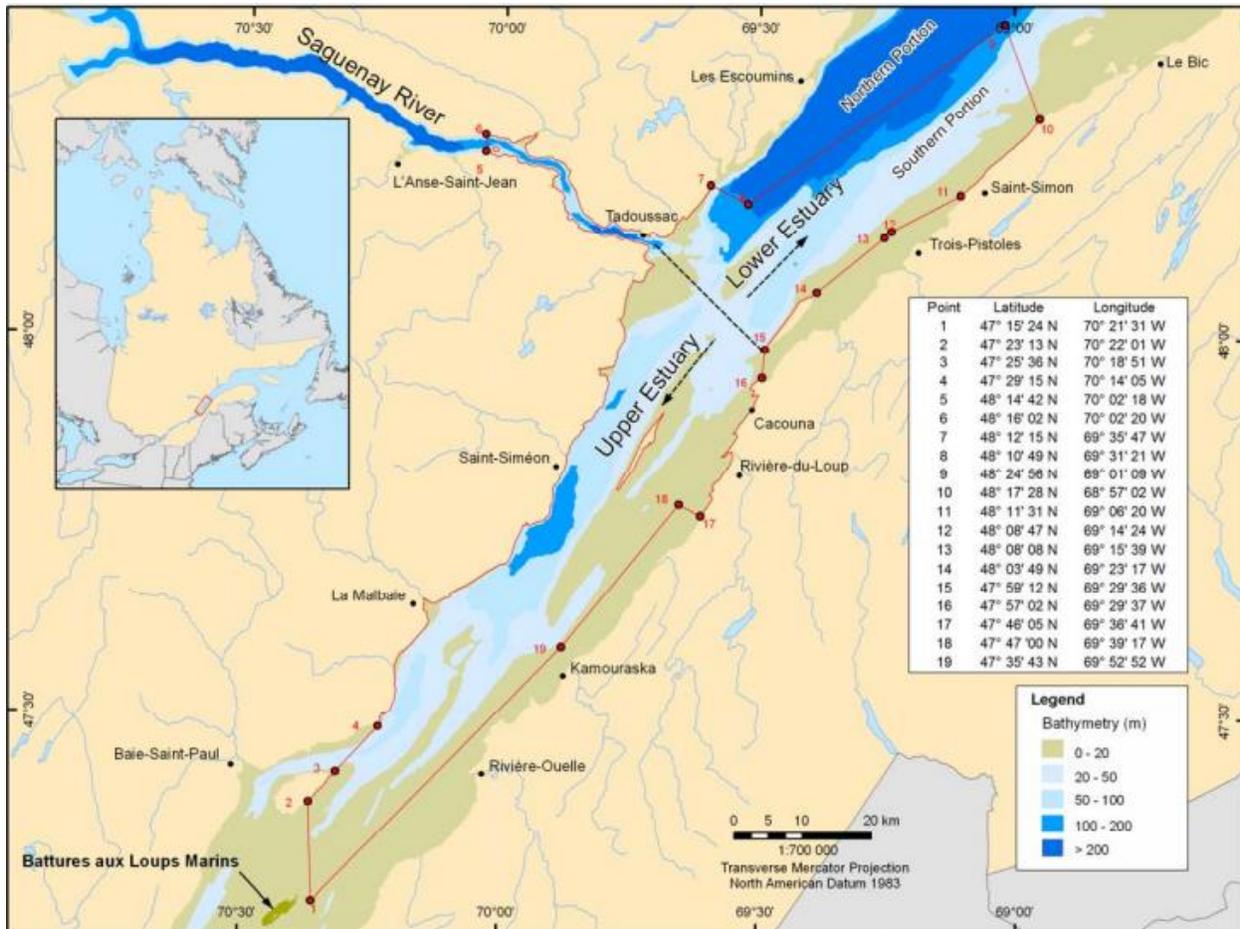


Figure 1. Critical habitat of the St. Lawrence Beluga Whale (from DFO, 2012).

The population's summer range is located downstream of the heavily industrialized Great Lakes–St. Lawrence watershed, and overlaps with a busy international waterway that is used daily by numerous vessels. As a result, this area has received inputs of various toxic chemicals, including releases of industrial effluents, agricultural runoff, municipal wastewater, wastewater from ships, and ballast water (DFO 2007a). Although the levels of some toxic substances have declined in recent years (Simond et al. 2017; Blouin et al. 2022; Simond et al. 2023), chemicals introduced in recent decades and emerging compounds continue to pose a threat to the health of Belugas (Simond et al. 2020, 2022, 2023). In addition, vessel-generated noise has been found to reduce the whales' acoustic space (McQuinn et al. 2011; Gervaise et al. 2012; Chion et al. 2017, 2021). A recent study (Vergara et al. 2021) demonstrated that ship and boat noise can interfere with communication between females and their newborns. Harvesting of fish stocks, including some species that are important food sources for the Beluga in its various habitats, may also have adverse effects on the population (Plourde et al. 2014; Williams et al. 2017; Lesage 2021). The deteriorating trend in body condition observed since the late 1990s suggests a reduction in prey availability or quality, or a decline in foraging efficiency (Bernier-Graveline et al. 2021; Lesage 2021).

## Population size and dynamics

Intensive hunting reduced SLE Beluga numbers to less than 10% of the estimated total population size in the late 1800s (Mosnier et al. 2015). After hunting was banned in 1979, population recovery was slow, with annual growth rates of 0 or less than 1%, and the population numbered only 1,000 individuals in the early 2000s. A decline of around 1% per year then began according to an evaluation of the status of the SLE Beluga population conducted in 2013 (Mosnier et al. 2015).

Since then, new data on population health and demography as well as seasonally important habitats have been acquired. In addition, correction factors for photographic and aerial survey estimates have been revised. Updating this information improved the accuracy of the abundance of the SLE Beluga population, which was estimated to be 1,850 individuals (95% confidence interval: 1,500 to 2,200) in 2022 (DFO 2023). Until 2007, the estimated trajectories between the 2012 and 2022 assessments are consistent and indicate a decline. However, they diverge afterwards. The new model, extending the time series by nearly 10 years, shows an upward trajectory in the population after 2008, possibly related to the decrease in cancer incidence (Lair et al. 2016). The population then appears to have stabilized between 2018 and 2022, likely due to the poor survival of calves and pregnant females for more than a decade, which is presumed to have had a negative impact on population growth (DFO 2023).

The SLE Beluga population has undergone major changes in its dynamics and its age structure. During the period of stability from 1984 to 1998, the population had a 3-year reproductive cycle and consisted of approximately 42% immature individuals and 7.5% newborns. The shift to an unstable situation, from 1999 to 2012, was marked by a shortening of the reproductive cycle and a decrease in the proportions of immature individuals (33%) and newborns (6%). A considerable increase in adult female and newborn mortality during the calving season, also referred to as parturition-associated mortalities, has been observed since 2008 and persists to this day (Lair et al. 2014, 2016; Lair 2018, 2019, 2020; Lesage 2021, Tinker et al. 2024). Although the reasons for this trend are unknown, the increased mortality could be due to several factors: exposure and accumulation of certain classes of toxic chemicals from a young age, possibly leading to parturition problems; interference with the mother-calf bond caused by anthropogenic disturbance (Ménard et al. 2014; Vergara et al. 2021; Lair et al. 2016); and a deterioration in female body condition, resulting in parturition-related complications or abandonment of the calf (Bernier-Graveline et al. 2021; Lesage 2021). A decrease in the number of adult male carcasses found washed ashore has also been observed over the past decade. Several hypotheses, which have yet to be confirmed, have been formulated to explain this decrease (Lesage 2021). One of these explained by a marked reduction in the incidence of certain types of cancer in this population (Lair et al. 2016), which would thus increase the survival of both sexes, males and females. However, the increase in parturition-associated mortalities may have reduced the positive effect of the contaminant levels in adult females.

## Recovery measures and objectives

The recovery objective in terms of population size, as defined in the Beluga recovery strategy, is to achieve “a long-term increase in population to 7,070 individuals, or 70% of its historical size.” This corresponds to the precautionary approach adopted by Fisheries and Oceans Canada (DFO) for managing various marine resources (DFO 2006; Hammill and Stenson 2007). These 6 recovery objectives have been established to meet this target, including the mitigation of several threats:

- 1) reduce contaminants in Belugas, their prey, and their habitat
- 2) reduce anthropogenic disturbances
- 3) ensure adequate and accessible food supply
- 4) mitigate the effects of other threats to population recovery
- 5) protect Beluga habitat in its entire distribution range
- 6) ensure regular monitoring of the SLE Beluga population

A “Review of the Effectiveness of Recovery Measures for St. Lawrence Estuary Beluga” was carried out for the SLE Beluga under Canada’s Oceans Protection Plan (Lesage 2017). For each recovery objective, the review assessed the effectiveness of ongoing and proposed measures regarding their direct contribution to mitigating the threats to the Beluga. It was concluded that, taken together, the measures implemented have not succeeded in bringing about a sufficient reduction in the threats to the Beluga population to meet the recovery objectives related to population size and distribution. The review reiterates the importance of implementing significant measures simultaneously to mitigate the 3 main threats (contaminants, reduced prey availability, and anthropogenic disturbance, including noise). The results of the review (Lesage 2017) informed the development of the measures included in this action plan, and will continue to guide management actions moving forward.

Williams et al. (2021) conducted a population viability analysis on the SLE Beluga in 2017 to determine the relative importance of the main threats to the population’s recovery, and to predict the effects of various threat reduction scenarios on demographic parameters. This modelling exercise showed that, even under the most optimistic threat management scenarios, it is unlikely that the recovery objective will be achieved (Williams et al. 2021). However, it has been demonstrated that the population can still return to a positive growth rate, provided that simultaneous actions are implemented. This synergy of actions would be all the more important in the current context where the effects of global warming could pose an additional risk to the SLE beluga. It is therefore important to reduce contaminant levels and anthropogenic disturbance, including noise, and to promote increased prey availability and quality. After a viability analysis was conducted in 2017, an action plan setting out a series of measures to reduce the impact of noise on the Beluga and other marine mammals at risk in the SLE was published (DFO 2020). DFO coordinates with Parks Canada (PC) a working group including various collaborators from the navigation industry (G2T3M) that proposes voluntary conservation measures within the boundaries of the Saguenay–St. Lawrence Marine Park and in surrounding waters. PC has also implemented structural measures to reduce the physical and acoustic disturbance of Belugas in the marine park (Ménard et al. 2022; Turgeon et al. 2025).

In addition, following the most recent advisory report (DFO 2023) on the abundance and trajectory of the SLE Beluga population, new recovery targets have been proposed over the next 28 years, meaning one generation, and would be as follows:

- 1) achieve or exceed an average annual growth rate of 1%
- 2) reduce calf and pregnancy-associated female mortality by 25%
- 3) reduce annual anthropogenic mortality below potential biological removal (3.4 individuals per year)

This report suggests that the maximum population size that could be maintained in the SLE under current conditions is approximately 6,700 Belugas (95% confidence interval: 4,300 to 10,400). A long-term recovery target would be to exceed 2,500 mature individuals in 100 years (DFO 2023).

Under section 47 of SARA, the competent minister must prepare one or more action plans based on the recovery strategy. Therefore, action planning for the listed wildlife species' recovery is an iterative process. The implementation schedule, including the recovery measures outlined in this action plan, may be updated in the future through an amendment to this action plan or the development of another action plan, depending on the progression towards recovery. This document is part of a series of action plans that will be completed in accordance with the recovery strategy. As mentioned above, an initial multispecies action plan focusing on the Beluga Whale and other marine mammals at risk in the SLE, which deals specifically with the threat posed by anthropogenic underwater noise, has been published (DFO 2020). This action plan addresses all threats other than underwater noise that have been identified in the recovery strategy.

## 1.2 Measures to be taken to implement the recovery strategy

Successful recovery of the SLE Beluga is dependent on the actions of many authorities (federal, Government of Quebec, and the municipalities), First Nations, Canadian industry sectors, non-governmental organizations (NGOs), and Canadians in general. It requires the commitment and cooperation of the constituencies that will be involved in implementing the directions and measures set out in this action plan.

This action plan describes the measures that provide the best chance of achieving the population size and distribution objectives for SLE Beluga, including measures to be taken to address threats to the species and monitor its recovery. These measures will guide activities to be undertaken by DFO and other federal departments, First Nations, or other jurisdictions, organizations, and individuals that have an interest in SLE Beluga conservation. They may be amended as new information becomes available. DFO strongly encourages Canadians to participate in the conservation of the SLE Beluga by undertaking measures outlined in this action plan.

Table 1 identifies the measures that could be undertaken by DFO to support the recovery of the SLE Beluga.

Table 2 identifies the measures that could be undertaken collaboratively by DFO and partners listed. 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. As Canadians are invited to join in supporting and implementing the measures in this action plan, if you wish to participate in the implementation of one of these measures on your own behalf or on behalf of an organization, we invite you to contact the Species at Risk Program office at: [dfo.quesara-lepque.mpo@dfo-mpo.gc.ca](mailto:dfo.quesara-lepque.mpo@dfo-mpo.gc.ca).

The current federal funding programs available to support species at risk protection and recovery include the [Habitat Stewardship Program for Species at Risk](#), the [Aboriginal Fund for Species at Risk Program](#), and the [Canada Nature Fund for Aquatic Species at Risk](#).

### 1.2.1 Implementation schedule

The 2 tables below list all of the measures aimed at mitigating the threats identified by this action plan and to work towards achieving the recovery objectives. They are grouped into 4 broad strategies, the first 3 of which are subdivided into different approaches:

**Broad strategy 1:** Research and data acquisition

- Approach 1: Characterize pollutant sources and their effects on the SLE Belugas, their habitat, their prey, and sentinel species in the SLE
- Approach 2: Continue research on the SLE Belugas' diet
- Approach 3: Characterize anthropogenic disturbances
- Approach 4: Continue studies on habitats, their functions and their use by SLE Belugas
- Approach 5: Monitor the status and health of the SLE Beluga population

**Broad strategy 2:** Threat management

- Approach 1: Reduce contaminants, emissions, and discharges of all types of pollutants and reinforce the application of environmental laws and regulations
- Approach 2: Conserve and protect SLE Belugas, their prey and their habitat
- Approach 3: Reduce anthropogenic disturbances within the SLE Belugas' range
- Approach 4: Detect and prevent biological threats

**Broad strategy 3:** Communication and outreach

- Approach 1: Disseminate and implement the education strategy on species at risk in the Saguenay–St. Lawrence Marine Park to extend this strategy to the SLE Belugas' entire range
- Approach 2: Inform and raise awareness among mariners about the applicable regulations and the impacts of pollutant spills
- Approach 3: Inform and raise awareness among captains and navigators of all types of vessels about anthropogenic impacts

**Broad strategy 4:** Implementation coordination and monitoring

The recovery measures listed in the implementation schedule are linked to the population size and distribution objectives set out in section 1.1 of this document and defined in the recovery strategy.

Due to the nature of its mandate and expertise, DFO will be required to participate in the majority of the measures identified in Table 1 and 2. Several organizations have contributed to the development of the action plan (appendix B) and will be invited to participate in its implementation. The order in which stakeholders are listed in the table is unrelated to their contribution or the degree of their involvement. Each stakeholder's participation will be defined in the processes leading to the implementation of the measures and may vary greatly. Examples include in-kind contributions (vessel time, human resources, etc.), financial contributions, research capacity development, and implementation of measures. However, the lists of stakeholders in tables 1 and 2 are subject to change. Each stakeholder's role, and the approach and protocols for implementing the measures, will be determined in subsequent phases.

This action plan does not present specific details on work planning for each measure, but is meant to guide DFO and its partner organizations by identifying measures that may be taken to advance the recovery of the SLE Belugas. It builds upon many successful activities already underway while recognizing that other measures need to be initiated or enhanced.

**The following acronyms are used in the implementation schedule (tables 1 and 2):**

AAC	Agriculture and Agri-Food Canada
CCG	Canadian Coast Guard
CEPA	<i>Canadian Environmental Protection Act</i>
CIRRELT	Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation
CLSLP	Corporation of Lower St. Lawrence Pilots
CPA	Canadian Port Authorities
CPSLC	Corporation des pilotes du Saint-Laurent central
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
ECRC	Eastern Canada Response Corporation
G2T3M	Working Group on Marine Traffic and Protection of Marine Mammals
IAAC	Impact Assessment Agency of Canada
LPA	Laurentian Pilotage Authority
MOA	Marine observation activities
MPA	Marine Protected Area
NGO	Non-governmental organizations
OECM	Other Effective area-based Conservation Measures
PC	Parks Canada
QMMERN	Quebec marine mammal emergency network [Réseau québécois d'urgences pour les mammifères marins]
SLE	St. Lawrence Estuary
SSL	Stratégies Saint-Laurent
SSLMP	Saguenay–St. Lawrence Marine Park
TC	Transport Canada

**Table 1. Recovery measures to be undertaken by Fisheries and Oceans Canada (DFO) for the Beluga Whale Population of the St. Lawrence Estuary (SLE).**

#	Recovery measure	Broad strategy and approach	Priority <sup>2</sup>	Threats or objectives addressed	Status and timeline <sup>3</sup>
1	Continue conducting systematic aerial surveys at least once every 3 years to document changes in population distribution, size and recruitment.	1-5	High	Objective 6	Underway – Continuous
2	Identify the important habitats used by SLE Belugas outside of the summer months, including the characteristics that make the habitats suitable for this population and the vital functions they support, in order to review its critical habitat identification.	2-2	High	Objective 5	Underway – Short term

<sup>2</sup> “Priority” reflects the degree to which the measure contributes directly to the recovery of the species or is an essential precursor to a measure that contributes to the recovery of the species:

- "high" priority measures are considered likely to have an immediate and/or direct influence on the recovery of the species
- "medium" priority measures are important but considered to have an indirect or less immediate influence on the recovery of the species
- "low" priority measures are considered important contributions to the knowledge base about the species and the mitigation of threats

<sup>3</sup> “Status and timeline” first indicates whether it is a new measure to reduce threats to the SLE Belugas or whether it is already being implemented. It then specifies the time required to implement each measure: short term (less than 5 years), medium term (between 5 and 10 years), long term (more than 10 years) or continuous (meaning the activity will be carried out on an ongoing basis or whenever there is an opportunity). Timelines should be interpreted based on the publication date of the action plan. Knowledge of threats to the SLE Belugas is always evolving and requires an adaptive management strategy; the timelines and protocols that are required will be adjusted as measures are implemented.

**Table 2. Recovery measures to be undertaken collaboratively between Fisheries and Oceans Canada (DFO) and its partners for the Beluga Whale Population of the St. Lawrence Estuary (SLE).**

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
3	Continue studies to identify and conduct spatio-temporal monitoring of the main sources of contaminants in the Great Lakes, the St. Lawrence River, the SLE, as well as in the Saguenay River, particularly in the habitat of the Beluga and its prey.	1-1	High	Contaminants	Underway - Continuous	<b>Environment and Climate Change Canada (ECCC)</b> , academia, DFO, First Nations, Ontario and United States governments and organizations, Parks Canada (PC), Transport Canada (TC), Impact Assessment Agency of Canada (IAAC), other government authorities
4	Identify and quantify concentrations of the main contaminants (known and emerging) accumulated in tissues of the SLE Beluga, its prey, and monitor temporal trends.	1-1	High	Contaminants	Underway - Continuous	<b>DFO</b> , PC, academia, other government authorities

<sup>4</sup> "Priority" reflects the degree to which the measure contributes directly to the recovery of the species or is an essential precursor to a measure that contributes to the recovery of the species:

- "high" priority measures are considered likely to have an immediate and/or direct influence on the recovery of the species
- "medium" priority measures are important but considered to have an indirect or less immediate influence on the recovery of the species
- "low" priority measures are considered important contributions to the knowledge base about the species and the mitigation of threats

<sup>5</sup> "Status and timeline" first indicates whether it is a new measure to reduce threats to the SLE Belugas or whether it is already being implemented. It then specifies the time required to implement each measure: short term (less than 5 years), medium term (between 5 and 10 years), long term (more than 10 years) or continuous (meaning the activity will be carried out on an ongoing basis or whenever there is an opportunity). Timelines should be interpreted based on the publication date of the action plan. Knowledge of threats to the SLE Belugas is always evolving and requires an adaptive management strategy; the timelines and protocols that are required will be adjusted as measures are implemented.

<sup>6</sup> Leading partners are identified in bold, others are listed in alphabetical order. Leading partners are not identified for all activities.

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
5	Acquire knowledge about contaminants of concern (for example, flame retardants, pharmaceuticals and personal care products, PBTs, hydrocarbons), and conduct a risk-based assessment of different chemicals of concern in the SLE Beluga, its prey, and their habitat.	1-1	High	Contaminants	Underway - Continuous	DFO, ECCC, other government authorities
6	Conducting field and laboratory studies on the toxicity and mechanisms of action of priority contaminants (including compounds) in order to predict their potential effects on the health of SLE Belugas.	1-1	Medium	Contaminants	Underway - Long term	DFO, First Nations, academia
7	Synthesize knowledge about the behaviour of spills of pollutants in cold, ice-covered water.	1-1	Medium	Accidental spills of toxic substances	Underway - Long term	Academia, Canadian Coast Guard (CCG), DFO, ECCC, other government authorities
8	Evaluate the risks posed by vessels (particularly those carrying toxic materials) navigating in the SLE Beluga's habitat. <ul style="list-style-type: none"> <li>Document the pollutants transported by vessels, the pollutant volume and the areas the vessels are transiting.</li> <li>Document the risks associated with the transshipment of oil between vessels, particularly in areas used by SLE Belugas.</li> <li>Document grey water, waste water and ballast water discharged from ships, their volume and the areas most affected.</li> </ul>	1-1	Low	Accidental spills of toxic substances	Underway - Short term	TC, academia, CCG, Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT), Corporation of Lower St. Lawrence Pilots (CLSPL), Canadian Port Authorities (CPA), Corporation des pilotes du Saint-Laurent central (CPSLC), Customs, DFO, Laurentian Pilotage Authority (LPA), PC, other government authorities

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
9	<p>Continue research on the SLE Beluga's diet.</p> <ul style="list-style-type: none"> <li>• Increase knowledge of the Beluga diet, particularly in the spring, and of mature females and juveniles.</li> <li>• Study the potential effects of marine activities on the Beluga's diet.</li> </ul>	1-2	High	Reduction in prey abundance, availability and quality	Underway - Short term	DFO, academia, First Nations, Non-Governmental Organizations (NGOs), PC
10	<p>Continue studying prey availability and the factors that can influence prey distribution, quantity and quality.</p> <ul style="list-style-type: none"> <li>• Increase knowledge about capelin, sand lance, herring, American eel, and other potential Beluga prey species, as well as their important habitats, particularly in the Upper Estuary.</li> <li>• Carry out work to identify spawning sites, nursery areas and the spatio-temporal distribution of larvae.</li> <li>• Evaluate the impact of variations in oceanographic and climatic conditions, as well as fisheries on prey abundance, distribution, size and quality, and on seasonal and interannual variations of migration routes.</li> </ul>	1-2	High	Reduction in prey abundance, availability and quality	Underway - Medium term	DFO, academia, First Nations, PC, other government authorities
11	<p>Characterize the genetic structure of populations of species preyed on by the SLE Beluga and implement, if necessary, protective measures for populations endemic to the SLE.</p>	1-2	Medium	Reduction in prey abundance, availability and quality	Underway - Continuous	Academia, DFO, First Nations, PC, other government authorities
12	<p>Gather information on the harvesting of potential SLE Beluga prey collected in recreational and bait fisheries.</p>	1-2	Medium	Reduction in prey abundance, availability and quality	New - Continuous	DFO, First Nations, PC, other government authorities

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
13	Develop a common framework for assessing the cumulative effects of marine activities and use it to analyze effects in the St. Lawrence and Saguenay Rivers to limit harmful effects on marine biodiversity, including the SLE Beluga.	1-3	High	Anthropogenic disturbance	Underway - Short term	<b>TC, DFO, PC,</b> academia, CCG, First Nations, IAAC, marine industry, NGO, other government authorities
14	Continue studies to determine the short and long term synergistic effects of chronic disturbances on the health of the SLE Beluga population.	1-3	Medium	Anthropogenic disturbance Habitat degradation	Underway - Medium term	<b>DFO, PC, TC,</b> academia, First Nations, NGO
15	Continue and improve monitoring of incidents involving SLE Belugas (ship strikes, injury, incidental capture, harassment, etc.).	1-3	Medium	Anthropogenic disturbance Strikes and entanglements	Underway - Continuous	<b>Quebec marine mammal emergency network [Réseau québécois d'urgences pour les mammifères marins] (QMMERN), academia, DFO, PC,</b> NGO
16	Evaluate the risk to SLE Beluga posed by ship strikes.	1-3	Medium	Strikes and entanglements	New - Continuous	<b>NGO, PC,</b> academia, DFO, QMMERN
17	Determine the proportion of the SLE Beluga population that uses the different parts of its distribution to identify key areas requiring protection.	1-4	High	Objectives 5 and 6	Underway - Short term	<b>DFO, PC,</b> academia, First Nations, NGO, other government authorities
18	Increase knowledge of SLE Beluga habitat functions and usage, including the areas linked to feeding and particularly in the spring.	1-4	High	Objectives 3 and 6	Underway - Medium term	<b>DFO,</b> academia, First Nations, NGO, PC, other government authorities

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
19	Develop indicators and reference points to evaluate the health, reproduction and physical condition of SLE Belugas to monitor threats affecting the population.	1-5	High	Objective 6	Underway - Continuous	Academia, DFO, NGO
20	Monitor regulated contaminants (for example, persistent organic pollutants) in the SLE Beluga, its prey and its habitat to evaluate the effectiveness of the measures implemented under the <i>Canadian Environmental Protection Act</i> (CEPA) and to develop additional strategies for contaminant monitoring and registration.	2-1	High	Contaminants	Underway – Long term	<b>ECCC, DFO, PC</b>
21	Continue pollution (contaminants) reduction efforts in the Great Lakes, the St. Lawrence River and the SLE as well as in the Saguenay River through interprovincial, national and international initiatives. <ul style="list-style-type: none"> <li>Undertake targeted efforts to reduce pollution from wastewater discharges into SLE Beluga's habitat.</li> </ul>	2-1	High	Contaminants	Underway - Continuous	DFO, ECCC, TC, other government authorities, and municipalities of Quebec, Ontario and U.S.
22	Implement a program to monitor contaminants of concern in water, sediments and aquatic organisms in the SLE and the Saguenay River.	2-1	High	Contaminants	Underway - Continuous	<b>ECCC, PC, DFO, First Nations</b>
23	Develop a pollutant spill response plan, including stakeholder roles and responsibilities, to protect marine mammals, particularly the SLE Beluga.	2-1	High	Accidental toxic spills	Underway - Continuous	<b>DFO, CCG, merchant shipping, QMMERN, Eastern Canada Response Corporation (ECRC), PC, TC</b>

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
24	Improve spill response techniques to minimize impacts on the SLE Beluga and its habitat, particularly in cold, ice-covered water.	2-1	Medium	Accidental toxic spills	Underway - Long term	<b>CCG, DFO</b> , academia, ECCC, ECRC, First Nations, other government authorities
25	Use environmentally sensitive decontamination techniques to continue cleaning up contaminated aquatic and terrestrial sites that have been identified as priority areas for the SLE Beluga.	2-1	Medium	Contaminants	Underway - Continuous	DFO, NGO, ports, marinas, other government authorities
26	Establish reduction indicators of threats to the SLE Beluga and monitor their effectiveness.	2-1	Low	Objectives 1, 2, 3 and 4	New - Continuous	Academia, DFO, ECCC, PC, other government authorities
27	Assess the status of herring in the Gulf of St. Lawrence and its connectivity to the SLE in order to consider the dietary needs of the Beluga in allocated fishing quotas.	2-2	Medium	Reduction in prey abundance, availability and quality	New - Continuous	<b>DFO</b> , fishermen, other government authorities
28	Strengthen protection of important sites for SLE Beluga’s key prey species, particularly spawning sites, retention areas and migration routes.	2-2	Medium	Reduction in prey abundance, availability and quality	Underway - Continuous	<b>DFO</b> , PC, other government authorities
29	Evaluate the impact of mobile fishing gear on SLE Beluga’s habitat and prey species.	2-2	Medium	Objectives 1, 2, 3 and 5	Underway - Short term	<b>DFO</b> , First Nations, fishermen, PC
30	Implement measures to regulate fishing activities in the SLE that pose a risk to the Beluga, its prey and their habitat.	2-2	Medium	Objectives 1, 2, 3 and 5	New – Short term	<b>DFO</b> , First Nations, PC, other government authorities

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
31	Continue initiatives to protect the SLE Beluga and its habitat, such as the establishment of marine protection areas (MPAs) and other effective area-based conservation measures (OECMs) including the Saguenay–St. Lawrence marine park expansion project.	2-2	High	Objectives 2, 3 and 5	Underway - Continuous	<b>DFO, PC</b> , First Nations, marine tour operators, NGO, other government authorities
32	Develop technological tools and methods for evaluating distances over water to reduce the risk of disturbances and ship strikes, make it easier for navigating users to comply with regulations, and ensure park wardens and fishery officers enforce regulations.	2-3	Medium	Anthropogenic disturbances Strikes and entanglements	Underway - Continuous	<b>DFO, PC</b> , academia, NGO, TC
33	Assess all coastal and offshore development projects and activities in the SLE and Saguenay River, and their potential impacts on the SLE Beluga, its prey and their habitat.	2-3	High	Anthropogenic disturbance Habitat degradation	Underway - Continuous	<b>TC, DFO, PC, IAAC</b> , marine industry, ports, project proponents, consulting firms, First Nations, other government authorities
34	Closely monitor coastal and offshore projects, and implement measures to avoid or, if avoidance is not possible, mitigate harmful effects on SLE Beluga.	2-3	High	Anthropogenic disturbance Habitat degradation	Underway - Continuous	<b>DFO, project proponents, NGO</b> , consulting firms, PC, ports
35	Continue identifying and implementing protective measures and best practices to minimize the impacts of marine traffic on SLE Beluga (for example, modification of navigation routes, speed reduction, maritime traffic quota).	2-3	High	Anthropogenic disturbance Strikes and entanglements	Underway - Medium term	<b>DFO, Working Group on Marine Traffic and Protection of Marine Mammals (G2T3M), TC, PC</b> Avantage Saint-Laurent, merchant shipping

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
36	Develop and implement alternative approaches to ship-board marine mammals observation, and diversify opportunities for observing SLE Belugas from shore to encourage greater public appreciation of the species.	2-3	High	Anthropogenic disturbance Strikes and entanglements	Underway - Continuous	<b>PC, NGO, First Nations, DFO, other government authorities</b>
37	Explore the possibility of implementing an authorization system to standardize the marine observation activities (MOAs) in Canadian waters	2-3	Medium	Anthropogenic disturbance	Underway - Short term	<b>DFO, PC, TC</b>
38	Strengthen and expand the toxic algae monitoring program in the SLE to maintain capacity to detect algal blooms and to support the monitoring of toxins in Belugas.	2-4	Low	Biological threats	Underway - Continuous	<b>DFO, PC</b>
39	Implement management or monitoring measures for nutrients (for example, nitrogen and phosphorus compounds) in the SLE and the Saguenay River to limit eutrophication.	2-4	Low	Biological threats	New - Continuous	Academia, DFO, Agriculture and Agri-Food Canada (AAC), municipalities, PC, other government authorities
40	Encourage companies that offer MOAs to follow navigation best practices and comply with the regulations, particularly by promoting environmental certification programs (such as the Eco-Whale Alliance) and by extending these programs to MOA companies outside of the Saguenay–St. Lawrence Marine Park (SSLMP).	3-1	Medium	Anthropogenic disturbance Strikes and entanglements	Underway - Continuous	<b>PC, NGO, TC, DFO, First Nations, marine tour operators, other government authorities</b>
41	Educate relevant stakeholders and ensure compliance with regulations about the pollutant discharges and transport as well as their effects on aquatic ecosystems.	3-2	High	Contaminants Accidental toxic spills	Underway - Continuous	ECCC, TC, MPO, municipalities, NGO, ports, other government authorities

#	Recovery measure	Broad strategy and approach	Priority <sup>4</sup>	Threats or objectives addressed	Status and timeline <sup>5</sup>	Partners <sup>6</sup>
42	Continue raising awareness and training of boaters and vessel captains that navigate within the SLE to ensure they adopt exemplary conduct in the presence of Belugas.	3-3	High	Anthropogenic disturbance  Strikes and entanglements	Underway - Continuous	<b>PC, DFO, NGO</b> , Eco-Whale Alliance, merchant shipping, recreational associations, TC, other government authorities
43	Maintain the <a href="#">State of the St. Lawrence Monitoring Program</a> .	4	Medium	Reduction in prey abundance, availability and quality	Underway - Continuous	DFO, ECCC, First Nations, PC, Stratégies Saint-Laurent (SSL), other government authorities
44	Maintain the SLE Beluga carcass recovery and necropsy programs in order to document demographic parameters, causes of mortality, and the impact of threats on the species over time.	4	High	Objectives 1, 2, 4 and 6	Underway - Continuous	<b>DFO, QMMERN</b> , academia, PC
45	Strengthen the response capacity of the Quebec marine mammal emergency response network (QMMERN) in respond to incidents involving Belugas in distress.	4	Low	Objectives 2 and 4	Underway - Continuous	<b>DFO, QMMERN</b> , CCG, First Nations, NGO, PC
46	Promote the development and implementation of a network for the exchange of knowledge on the SLE Beluga and threats that affect it.	4	High	All objectives and threats	New - Continuous	<b>DFO</b> , ECCC, Academia, First Nations, NGO, PC, other government authorities
47	Maintain updated databases of opportunistic observations, photo-identification, and analyses.	4	Medium	Objective 6	Underway - Continuous	Academia, Canadians, DFO, First Nations, NGO, PC, St. Lawrence users

### 1.2.2 Description of measures in the implementation schedule

The implementation tables (tables 1 and 2) contain 47 recovery measures that will contribute to meeting all 6 recovery objectives for the SLE Beluga (section 1.1). These recovery measures target the main threats to the species, specifically contaminants, anthropogenic disturbance, reduction in prey availability and quality, vessel strikes, entanglement in fishing gear, habitat degradation, spills of toxic substances, and biological threats (epizootics and harmful algal blooms). Many of the measures set out in this action plan may benefit other species at risk in the SLE and face common threats, including the Blue Whale (*Balaenoptera musculus*), Atlantic population; the North Atlantic Right Whale (*Eubalaena glacialis*); and the Fin Whale (*Balaenoptera physalus*), Atlantic population.

In this section, additional information on groups of measures allows for a better understanding of the implementation of the measures included in this action plan. The inclusion of a narrative is not meant to imply a measure is of higher priority, nor is it meant to suggest that progress is more or less advanced than it is for a measure without a narrative.

The measures included in the broad research and data acquisition strategy are aimed at identifying the habitat requirements of the population (measures 1, 17 to 19, and 47); quantifying and examining the effects of pollutants on SLE Beluga and other biotic and abiotic components of the ecosystem (measures 3 to 8). In addition, this strategy aims to continue research on the Beluga's diet and changes in populations of its prey species (measures 9 to 12); and characterize marine activities, coastal and offshore development, particularly regarding cumulative effects (measures 13 and 14), and associated incidents (measures 15 and 16). New knowledge will be acquired on areas used by the SLE Beluga in the fall, winter, and spring to identify the life functions that are supported by its habitat throughout the year and to better target the threats that contribute to the population's precarious situation outside of its summer distribution area. Spring is a critical period for females as they need to build up their energy reserves for the summer calving season. Therefore, some measures specifically target the foraging areas used by females and the health indicators of individuals in the spring (measures 9, 18, and 19).

The broad threat management strategy consists of measures to reduce contaminants through the administration of existing environmental protection legislation and regulations, such as the *Fisheries Act*, SARA, etc. (measures 20 to 25); protect the SLE Beluga, its prey species and their habitat (measures 2 and 26 to 31); reduce anthropogenic disturbance caused by marine activities, including navigation and coastal and offshore development, through voluntary management measures and/or existing environmental protection legislation and regulations (measures 32 to 37); and monitor biological threats (measures 38 and 39). The aim of these management measures is to mitigate, or avoid the impacts of identified threats on the SLE Beluga.

The communication and outreach measures will provide for the development of educational strategies to reach more SLE users, particularly tour boat operators and recreational boaters. Various topics will be prioritized, including the existing regulations and the effects of human activities on the SLE Beluga (measures 40 to 42). These measures will be implemented in large part through the participation of DFO, the managers of Saguenay–St. Lawrence Marine Park, as well as NGOs.

The final measures set out in this action plan concern coordination, maintenance, and monitoring. They relate to maintaining the monitoring and response programs (measures 43 to 45 and 47) as well as cooperation among stakeholders (measure 46).

## **2 Critical habitat**

### **2.1 Identification of the species' critical habitat**

#### **2.1.1 General description of the species' critical habitat**

Critical habitat is defined in SARA as "... the habitat that is 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." [subsection 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." [subsection 2(1)]

Critical habitat for SLE Beluga is identified using the best available information at the time of the identification, in section 2.4 of the Recovery Strategy for the Beluga Whale (DFO 2012). The designated habitat corresponds to part of the Upper Estuary, from the Battures aux Loups Marins, the southern portion of the Lower Estuary off Saint-Simon, and the lower reaches of the Saguenay River. This area corresponds to the summer distribution for groups of females accompanied by newborns and juveniles (figure 1).

The schedule of studies to identify critical habitat (section 2.4.3 of the recovery strategy) aims to identify other habitat areas used by the Beluga, specifically those used in the spring, fall and winter, as well as the functions they support. New areas of critical habitat may be added as a result of recent population monitoring efforts. DFO and its partners are continuing to gather information that could support such a decision. Any changes or additions to the identified critical habitat will occur through an amendment to the recovery strategy.

### **2.2 Activities likely to result in the destruction of critical habitat**

Examples of activities likely to result in destruction of critical habitat may be found in section 2.4 of the Recovery Strategy for the Beluga Whale (DFO 2012).

### **2.3 Measures to protect critical habitat**

Under SARA, critical habitat must be legally protected within 180 days of being identified in a final recovery strategy or action plan and be included on the Species at Risk Public Registry.

The critical habitat for the SLE Beluga was identified in the recovery strategy published in 2012 and is protected by a [SARA critical habitat order](#) made under subsections 58(4) and (5). The Critical Habitat of the Beluga Whale (*Delphinapterus leucas*) St. Lawrence Estuary Population Order, which came into effect in 2017, invokes the prohibition in subsection 58(1) against the destruction of any part of the identified critical habitat.

### 3 Evaluation of socio-economic costs and of benefits

SARA requires the competent minister to undertake an evaluation of the socio-economic impacts of the action plan. The evaluation includes the socio-economic costs of the action plan and the benefits to be derived from its implementation (SARA paragraph 49(1)(e)). This evaluation addresses only the incremental impacts of ‘new’ recovery measures outlined in this action plan (that is, measures that have not yet been implemented), recognizing that not all aspects of its implementation are under the jurisdiction of the federal government. This evaluation does not address any ‘underway’ measures (that is, measures that were initiated or implemented prior to the development of the action plan but have not yet been completed). ‘Underway’ measures are not considered as incremental costs to the government and other stakeholders, as these measures were being undertaken or were initiated prior to the development of the action plan (for example, research studies to identify critical habitat). In addition, the analysis does not address the costs associated with social and cultural changes and loss of access to the species by Indigenous Peoples and Canadians.

An estimate of the costs and benefits associated with this action plan are described below.

#### 3.1 Socio-economic costs of implementing this action plan

The recovery measures set out in this action plan can be divided into 2 broad categories. The first includes measures that could generate additional costs for governments (research, responses, monitoring, etc.). The second includes measures that could have a direct impact on industry sectors and the public.

##### 3.1.1 Recovery measures that could generate additional costs for governments

Of the 47 recovery actions in the action plan, 7 are new actions<sup>7</sup> that require additional funding from the federal and provincial governments. However, financial resources required to implement the recovery action plan have yet to be determined.

The funding required to carry out these new research, management and communication activities will be allocated according to priorities and available resources.. Although some measures may be costly for the government, others may provide sources of revenue for academia and NGOs<sup>8</sup>.

##### 3.1.2 Recovery measures that could result in direct costs to industry and the public

Measures 2, 30 and 31 could have direct effects on industry and the public.

Measure 2 states “Identify and designate the important habitats used by SLE Belugas outside of the summer months, including the characteristics that make the habitats suitable for this population and the vital functions they support, in order to review its critical habitat identification.” In the event that an additional area is identified as critical habitat for the SLE Beluga, socio-economic impacts can be expected depending on the nature and scope of the

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<sup>7</sup> These are measures 12, 16, 26, 27, 30, 39, and 46, and their description is available on pages 8 to 17.

<sup>8</sup> More details in the benefits section.

economic activities that will be affected, constrained or prohibited, attributable to the Critical Habitat Order.

Measure 30 states "Implement measures to regulate fishing activities in the SLE that pose a risk to the Beluga, its prey and their habitat." These measures, unknown at this time, could potentially increase the operating costs of some fishing companies active in the SLE.

Measure 31 states "Continue SLE Beluga's habitat protection initiatives, such as the establishment of marine protection areas (MPAs) and other effective area-based conservation measures (OECMs) including the Saguenay–St. Lawrence marine park expansion project." The establishment of the MPA could result in socio-economic impacts. However, these impacts cannot be attributed solely to the recovery measures for the SLE Beluga.

### 3.2 Socio-economic benefits of implementing this action plan

The aim of the SLE Beluga action plan is to contribute significantly to the recovery of SLE Beluga and achieve objectives in terms of population size and distribution set out in the recovery strategy.

Many of the benefits derived from biodiversity conservation, including the protection and recovery of species at risk, are non-market commodities that are difficult to quantify but could be significant. SARA 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." A review of the literature confirms that Canadians place significant value on the preservation and conservation of species in and of themselves<sup>9</sup>, especially for a species of interest such as the Beluga Whale. Actions taken to preserve a species, such as habitat protection and restoration, are also valued. In addition, the more an action contributes to the recovery of a species, the higher the value the public places on such actions (Loomis and White 1996; DFO 2007b). Self-sustaining and healthy ecosystems, with their various elements in place, including species at risk, contribute positively to the subsistence and the quality of life of Canadians. To this end, without attributing a monetary value to the life of an individual or a population, it is important to underline that the SLE beluga contributes to regional tourism, and therefore has a consequent impact on the tourism offer and job creation in the regions bordered by the beluga whale's habitat.

In addition, Indigenous Peoples have occupied and used the territory since time immemorial, maintaining deep cultural, spiritual, and ecological connections to the land, its species, and biodiversity. Several Nations have a relationship with the SLE Beluga Whale. As such, the Innu of Uashat mak Mani-utenam support all measures aimed at maintaining biodiversity and restoring or maintaining threatened or endangered wildlife species in their Nitassinan, including Uapamek<sup>u</sup> (Beluga Whale in Innu aimun - the white whale). In addition, the Wolastoqiyik Wahsipekuk First Nation emphasizes the importance of the St. Lawrence Estuary Beluga Whale to its organization and identity. *Putep* (Beluga Whale in Wolastoqey) is an emblematic species of the *Wolastokuk*, where it has been used since time immemorial, notably on Île Verte from 1500 to 1000 years ago (Tremblay 1993). The Wolastoqiyik Wahsipekuk First Nation thus feels an unshakeable attachment to the St. Lawrence Beluga and, as such, supports any measures

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<sup>9</sup> Species at risk have option, legacy and existence values. Each of these values translates into a willingness of the population to pay for measures to ensure its recovery.

aimed at protecting the species as well as the ecological integrity of its habitat. The *Putep't-awt* Beluga Whale watching site testifies to the importance of the beluga to the Wolastoqiyik Wahsipekuk First Nation and the special place the species occupies in the Nation's contemporary way of life.

The conservation of species at risk is an important component of the Government of Canada's commitment to conserving biological diversity under the international *Convention on Biological Diversity*<sup>7</sup>. The Government of Canada has also made a commitment to protect and recover species at risk through the Accord for the Protection of Species at Risk. The implementation of this action plan will contribute to meeting these commitments.

Beluga recovery efforts will likely have positive effects on the greater SLE ecosystem and benefit many species, including other species at risk, that use the SLE to carry out their life processes. For instance, reducing contaminants upstream, near or in the SLE Beluga Whale habitat will have a positive effect on the overall health of the ecosystem and the animals in the Estuary. As this example illustrates, the recovery efforts that are underway are sparking interest outside of the species' known distribution area and are having a rallying effect on research and management as well as on public participation in conservation and biodiversity (DFO 2007b).

The action plan is expected to encourage the government of Canada to provide additional funding for some research activities, to implement actions reducing threats, and to monitor their effectiveness. This funding could especially benefit government programs, universities, NGOs, and research centres.

### 3.3 Distributional analysis

As outlined in previous sections, implementation of this action plan will require the cooperation of Indigenous Peoples, many organizations and groups, as well as contributions from the various government authorities, municipalities, research and educational centres, and NGOs. New groups may also become involved in recovery efforts in the future. Potential partners for each measure are listed in the last column of table 2. Most of the costs associated with the implementation of this action plan will be assumed by the various government authorities. However, for each of the other stakeholders, it is not possible at this time to determine the extent to which each will contribute to the implementation of this action plan, nor to accurately estimate its costs and benefits.

As the abundance and distribution of the SLE Beluga in Canadian waters can change over time, the costs incurred to implement the recovery measures set out in this action plan may vary as well. The Government of Canada will monitor the repercussions of these measures as efforts to protect this species continue.

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<sup>7</sup> International Convention ratified by Canada in 1992.

## 4 Measuring progress

### 4.1 Monitoring species' recovery

The performance indicators presented in section 2.6 of the recovery strategy provide a way to define and measure progress toward achieving the population size and distribution objectives. The measures in this action plan will further increase our understanding of the species, its population status and trajectory, and contribute to monitoring of the SLE Beluga in Canada. These 5 performance indicators will be used to report on the progress of recovery strategy implementation:

- increase in population size
- increase in the number of mature individuals to 1,000 adult Belugas
- increase in the distribution area
- increase in the yearly recruitment rate
- decrease in the mortality rate of newborns

In addition to performance indicators targeting the population's recovery, it has been recommended to establish performance indicators for implemented measures (Lesage 2017). Monitoring of these will be necessary to assess trends in threats and their impact on SLE Beluga health over time, thus guiding adaptive management.

### 4.2 Reporting on the implementation of the action plan

The Minister will monitor the implementation of the action plan, and progress towards meeting its objectives, by assessing progress towards completing the recovery measures identified in this action plan (under section 55 of SARA). The Minister will report on the action plan's implementation 5 years after the publication of the current document, which will be published in the [Species at Risk Public Registry](#).

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

## 5 Activities permitted by the action plan

Subsection 83(4) of SARA states that “subsections 32(1) and (2), section 33 and subsections 36(1), 58(1), 60(1) and 61(1) do not apply to a person who is engaging in activities that are permitted by a recovery strategy, an action plan or a management plan and who is also authorized under an Act of Parliament to engage in that activity, including a regulation made under section 53, 59 or 71.” [subsection 83(4)]

The following activity is permitted by the action plan:

- euthanasia of individual Beluga Whales of the SLE population under very specific conditions and by duly authorized persons

Although it is prohibited to kill individuals of aquatic species at risk listed under SARA as threatened, endangered, or extirpated, Beluga Whales are sometimes found, as a result of anthropogenic or natural incidents, seriously injured, ill, or unable to provide for themselves, and in a state that suggests certain imminent death. Consequently, the purpose of this authorization is to permit euthanizing one or several Beluga Whales of the SLE population in distress, only when euthanizing such individuals will alleviate their pain and suffering, and there is no chance of survival. This condition will be determined by a veterinarian, following an examination of the animal (Daoust and Ortenburger, 2015). The welfare of these individuals is a priority, as is the welfare of other cetacean species not listed on Schedule 1 of SARA. For this permitted activity to be valid, it must be authorized under paragraph 38(1)(d) of the *Marine Mammal Regulations*, SOR/93-56, made under the *Fisheries Act*.

In order to mitigate the impact of the loss of the individual in terms of achieving recovery objectives of the species, the implementation of other activities following euthanasia will be recommended. For example, the knowledge gained from carcasses through necropsies and the collection of samples, to the extent possible, will refine the management of the population to achieve recovery objectives.

An application for an authorization submitted to DFO by experts recognized as qualified in marine mammal intervention (for example veterinarians) will be reviewed and, if an authorization is issued, it will be valid for the period specified therein. Individuals acting under the authority of an authorization by DFO will be required to comply with all conditions included in the authorization.

In accordance with subsection 83(4) of SARA, this action plan authorizes qualified persons who hold an authorization issued under paragraph 38(1)(d) of the *Marine Mammal Regulations*, or who work on behalf of the permit holder, to euthanize one or more Beluga Whales of the SLE population. The authorization under the *Marine Mammal Regulations* will be issued by DFO or any person within the department who has the appropriate capacity to exercise the powers, duties and functions for the purposes of paragraph 38(1)(d) of the *Marine Mammal Regulations*.

This exemption is subject to the following conditions:

- euthanasia is considered a last resort solution and must only be done if an examination by a veterinarian has determined that the animal is certain to die imminently

- the animal must at all times be treated with respect and compassion, as well as in an appropriate manner from the point of view of animal welfare
- prior to euthanizing the individual, a notification from a veterinarian or the person in charge designated in the authorization, must be forwarded to DFO indicating that the individual is in distress, that it is certain to die imminently, and that euthanizing it is necessary to ease its pain and suffering
- all possible efforts will be made to ensure that the most effective and appropriate methods of euthanasia in regards to the animal's welfare are implemented.
- the euthanasia and the conditions of the authorization under paragraph 38(1)(d) of the *Marine Mammal Regulations* must comply with the guidelines, standards and techniques of the most up-to-date reference documents (for example [AVMA 2020](#); [CCAC 2010](#); [Daoust and Ortenburger 2015](#); [DFO 2015](#))
- a report must be prepared by the permit holder and submitted to DFO within 180 days after the euthanasia was performed

Other conditions may be included in the authorization issued by DFO. These will be reviewed regularly and will be amended, as necessary, as new information becomes available. DFO will work with researchers, veterinarians, and front-line workers (such as members of the marine mammal response network and fishery officers from DFO's Conservation and Protection directorate) in order to define response protocols (to ensure that conditions of authorization are complied with), and to prioritize the safety of participants and the well-being of Beluga Whales of the SLE population.

For activities other than euthanasia that are likely to interact with the SLE Beluga population in a manner prohibited by SARA, individuals are invited to contact Fisheries and Oceans Canada and visit our website at: <https://www.dfo-mpo.gc.ca/species-especes/sara-lep/permits-permis/index-eng.html>.

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

In accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#) (2010), *Species at Risk Act* recovery planning documents incorporate strategic environmental assessment (SEA) considerations throughout the document. 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 any component of the environment or achievement of any of the [Federal Sustainable Development Strategy](#)'s goals and targets.

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

Threats to the SLE Beluga affect many species that use the Estuary on a continuous, seasonal, or occasional basis. Measures to reduce the effects of threats to the Beluga must benefit the other marine mammals at risk in the SLE: the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic population; the North Atlantic Right Whale (*Eubalaena glacialis*); and the Fin Whale (*Balaenoptera physalus*), Atlantic population. For specific details on the potential environmental benefits of this action plan, refer to the sections of this document in which the recovery measures are outlined.

## Appendix B: record of cooperation and consultation

Action plans are to be prepared in cooperation and consultation with other jurisdictions, organizations, affected parties, and others as outlined in the *Species at Risk Act section 48*. Fisheries and Oceans Canada (DFO) held virtual workshops in fall 2020 to discuss potential measures and engage various partners in the development of this action plan. Subsequently, the draft action plan was sent for comments in fall 2022 to DFO sectors and to National Headquarters in spring 2023. All feedback received during these workshops and subsequent revisions was considered in the development of this action plan draft.

The collaborators who were involved at different stages of the development of the action plan are listed in table 3. They have been grouped by sector of activity.

**Table 3. List of partners and stakeholder groups that DFO sought input from for the development of the action plan for the SLE Beluga.**

Activity Sector	Affiliation	Attendees
Federal authorities	Parks Canada, Saguenay–St. Lawrence Marine Park (PC-SSLMP)	Cristiane C. Albuquerque Martins Félix Ledoux Nadia Ménard Samuel Turgeon
	Environment and Climate Change Canada (ECCC)	Andrée Gendron Jonathan Pritchard Magali Houde Julie Chagnon Monica Hilborn
	Canadian Coast Guard (CCG)	Véronique Gagnon Éric Esclamadon Amélie Boisjoly-Lavoie
	Fisheries and Oceans Canada (DFO)	Ali Magassouba Catherine Couillard Jacinthe Beauchamp Jean-Michel Poulin Jory Cabrol Tanya Brown Véronique Lesage Yves Clermont
	Transport Canada (TC)	Élise Lacaille John Harbour Josée Lessard Michel Charron
Government of Quebec	Ministère de l'Environnement et de la Lutte contre les changements climatiques, de la Faune et des Parcs du Québec (MELCCFP) [Quebec department of the environment and the fight against climate change, wildlife and parks]	Véronik de la Chenelière Isabelle Guay

Activity Sector	Affiliation	Attendees
Stakeholders from the commercial shipping sector	St. Lawrence Ship Operators	Françoise Quintus Louise Bédard
	Shipping Federation of Canada	Miako Ushio Sonia Simard
Stakeholders from the cruise sector	Croisières AML [AML Cruises]	Loïc Hamel
Stakeholders in the coastal and offshore projects sector	Rio Tinto Alcan	Catherine Munger
Academia	Faculty of Veterinary Medicine, University of Montreal	Stéphane Lair
	Department of Biology, University of Quebec at Montreal	Jonathan Verreault
Stakeholders in the marine mammal conservation sector	Group for Research and Education on Marine Mammals [Groupe de recherche et d'éducation sur les mammifères marins]	Robert Michaud
	Marine Mammal Observation Network [Réseau d'observation des mammifères marins]	Esther Blier Sonia Giroux
Stakeholders from the recreational boating sector	Nautisme Québec	André Benoit
First Nations	Innu Essipit	Donald Bouchard
	Pessamit	Majoric Pinette
	Huron-Wendat	Mario Gros-Louis
	Wolastoqiyik Wahsipekuk	Pierre Jenniss Samuel Leclerc

In addition, targeted external consultations on the draft action plan were held in the fall of 2023, during which DFO invited Indigenous groups, federal and provincial departments and targeted environmental groups to comment on the draft action plan.

Stakeholder, Indigenous, and public input was sought through the publication of the proposed document on the [Species at Risk Public Registry](#) for a 60-day public comment period held from November 28, 2024 to January 27, 2025. Comments received informed the final document.