A WHALE-WATCHER'S GUIDE TO WHALES ON THE EAST COAST OF CANADA

A Guide for Marine Mammal Observation Activities

1ST EDITION

In addition to helping make numerous coastal communities more dynamic, whale-watching operators play an essential role in whale conservation and the promotion of the St. Lawrence's biodiversity. The information contained in this guide aims to help whale-watching companies educate their crews on the numerous marine mammal species that inhabit eastern Canada, several of which are at risk. It presents up-to-date information on the potential effects of whale- and seal-related activities while educating whale-watching operators on mitigation measures that can minimize their impacts on these species and their environment. *A Whale-Watcher's Guide to Whales on the East Coast of Canada* is the third in a series of guides (the first two intended for shipowners and fishers, respectively) dedicated to educating the various users of the St. Lawrence and the east coast on how to responsibly navigate whale habitat.

Visit the Web-based platform **navigatingwhales.ca** to learn more about the topic and discover how you can get involved in whale conservation, notably by collecting observation data as well as reporting carcasses or vulnerable animals to emergency networks.

Navigating Whale Habitat

CREDITS

RESEARCH AND REPORTING

Mélissa Martel, Marine Mammal Observation Network

Stéphanie Pronovost, Marine Mammal Observation Network

Sonia Giroux, Marine Mammal Observation Network

COORDINATION AND REVIEW COMMITTEE

Cristiane C. de Albuquerque Martins, Parks Canada

Esther Blier, Marine Mammal Observation Network

Chloé Bonnette, Société des établissements de plein air du Québec

Odélie Brouillette, Group for Research and Education on Marine Mammals

Patrice Corbeil, Group for Research and Education on Marine Mammals

Virginie Christopherson, Fisheries and Oceans Canada

Natasha Dazé-Querry, Fisheries and Oceans Canada

Renée Gagné, Fisheries and Oceans Canada

Marie-Sophie Giroux, Parks Canada

Sonia Giroux, Marine Mammal Observation Network

Mélissa Martel, Marine Mammal Observation Network

Virginie Galindo, Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs du Québec

CONSULTATION COMMITTEE

Jean Roy, Croisières Baie de Gaspé

Guy Synnott, Croisières Baie de Gaspé

Gérald Harvey, Croisière Escoumins

Nicolas Moreau, Croisières Essipit

ENGLISH TRANSLATION

David Soares, translator and technical editor

GRAPHIC DESIGN

Akufen Studio | akufen.ca

COVER PHOTO

Marine Mammal Observation Network

187 Bernier Street
Rivière-du-Loup, Quebec G5R 0P3
418 867-8882

info@romm.ca | romm.ca

This initiative is made possible in part thanks to funding received under Fisheries and Oceans Canada's *Habitat Stewardship Program* (HSP) for Species at Risk.

Fisheries and Oceans Canada | Pêches et Océans Canada

PREFACE: SAGUENAY-ST. LAWRENCE MARINE PARK

We are pleased to publish this new guide intended for offshore excursion providers. This valuable tool will contribute to the objectives of the Saguenay-St. Lawrence Marine Park, the mandate of which is to raise the level of protection of a representative part of the Saguenay Fjord and the St. Lawrence Estuary for present and future generations.

As is the case for other locations in the Gulf of St. Lawrence, the ecosystems of the Marine Park are recognized for both their biodiversity and their extraordinary productivity. These ecosystems are vital for marine mammals in that they are an important source of food. Protecting this exceptional environment calls for a collective effort. In collaboration with whale-watching companies, a number of conservation measures have been implemented in the Marine Park. Such measures include the adoption of a regulatory framework that establishes sector-specific best practices, speeds and approach distances to comply with in the presence of whales.

However, given that whales do not recognize borders and their needs for protection go beyond the boundaries of the Marine Park, efforts must be expanded to include the animals' migratory corridors and other feeding grounds. This is precisely what this guide offers, namely by describing best practices and providing helpful information for whale-watching operators operating along Canada's east coast.

The Marine Park team is proud to have contributed to the creation of this new tool put together by MMON and its partners. Captains and naturalists working for whale-watching companies play a leading role in the protection of marine ecosystems, facilitating memorable experiences for visitors and educating them on the importance of protecting marine environments. It is therefore important to practise these activities in full respect of the animals and their ecosystems. Through their observations, captains and naturalists are also precious collaborators in knowledge acquisition efforts.

We would like to thank all those who participated in the development of this guide and the companies that will help put it into practice.

Nathaël Bergeron
Co-director, Parks Canada

Jérôme Gouron
Co-director, Sépaq

SAGUENAY–ST. LAWRENCE
MARINE PARK

Canada Québec

PREFACE: THE BANC-DES-AMÉRICAINS JOINT MARINE PROTECTED AREA

Marine protected areas (MPAs) play an essential role in maintaining marine biodiversity and improving the health or our aquatic ecosystems while contributing to the vitality of coastal communities. These areas are established to preserve unique and highly diverse marine environments so that the latter can continue to sustain the many species that inhabit them.

AMERICAN BANK: A FEEDING GROUND FOR MANY SPECIES

The submarine rocky ridge known as the American Bank is a unique place where the Gaspé current provides huge quantities of nutrients and zooplankton, making it an important feeding area for many species. With its numerous species of invertebrates, fish, marine mammals and seabirds, the American Bank harbours an exceptionally rich biodiversity.

In this context, the Banc-des-Américains MPA provides long-term protection to this incredible marine biodiversity including its ecosystem structure and unique natural characteristics by regulating human activities that can otherwise be harmful to this exceptional environment.

OBJECTIVES OF THE BANC-DES-AMÉRICAINS JOINT MARINE PROTECTED AREA

The Banc-des-Américains MPA is the first joint project covered by the Entente de collaboration Canada-Québec pour l'établissement d'un réseau d'aires marines protégées au Québec (Canada–Quebec Collaborative Agreement to Establish a Network of Marine Protected Areas in Quebec – in French only). The MPA therefore enjoys a dual protection status and is managed jointly by the federal and Quebec governments.

The Banc-des-Américains MPA was created to ensure the protection of a unique underwater topography. It supports the productivity and diversity of fishery resources that frequent the American Bank and adjacent plains. It also contributes to the recovery of species at risk. In this context, three conservation objectives have been identified:

- Preserve benthic habitats (seabed);
- Preserve pelagic habitats (water column) and forage species (prey);
- Promote the recovery of at-risk whales and wolffish.

DATA COLLECTION BY WHALE-WATCHING COMPANIES IS ESSENTIAL FOR MONITORING THE BANC-DES-AMÉRICAINS JOINT MPA.

One of the core focuses of the Banc-des-Américains joint MPA is adaptive management to ensure the preservation of marine biodiversity, including marine mammals. Frequent data collection in the field is important to detect potential changes and adapt management measures accordingly. Likewise, data gathering by whale-watching companies is essential to better understand marine mammal population dynamics (number of individuals, presence of young, health and portion of territory occupied). Data collection during whale-watching trips are an integral part of environmental monitoring for the Banc-des-Américains MPA. Whale-watching operators are therefore our eyes in the field!

AN INDISPENSABLE GUIDE!

Produced by the Marine Mammal Observation Network, *A Whale-Watcher's Guide to Whales on the East Coast of Canada* is a key tool for educating whale-watching companies on how to conduct their activities in the presence of whales. At the same time, it aims to contribute to the effective protection of the Banc-des-Américains MPA.

Enjoy!

Alain Guitard, *Director Marine Planning and Conservation and Species at Risk Management, Co-chair of the Banc-des-Américains MPA Management Committee, Fisheries and Oceans Canada*

Canada

Catherine Bernier, *Regional director, Co-chair of the Banc-des-Américains MPA Management Committee, Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs*

Québec

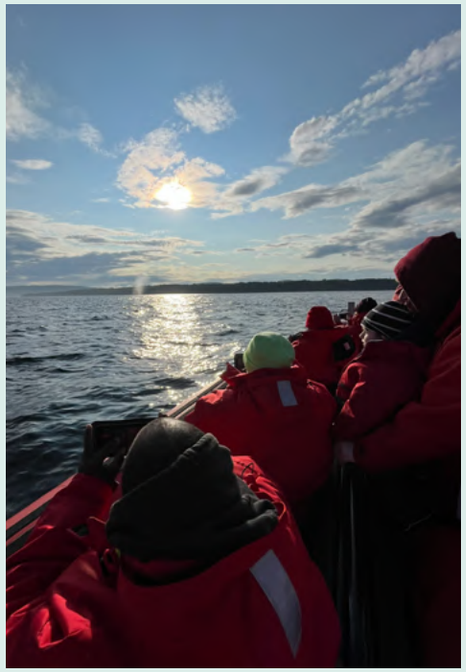
Table of Contents

Introduction

Around the world, the whale-watching industry and its increasingly popular activities have enjoyed strong growth over the past few decades. Offshore whale-watching activities contribute to the economy of many coastal communities. As a major tourist attraction for both national and international clienteles in Quebec and elsewhere along Canada's east coast, these activities generate a revenue stream for a large number of local companies, create jobs and draw numerous tourists away from the larger population centres. They are promoted as ecotourism since they are rooted in discovering nature in harmony with the environment and local culture, which further contributes to their popularity.

Observation of a humpback whale © R. Pintiaux

The whale-watching industry plays an important awareness-raising role by educating members of local communities and visitors alike on marine species and their habitats. It is a great privilege to be able to observe so many species so close to our coasts, as such biodiversity is usually found closer to the poles. Marine mammal conservation must remain a central focus of whale-watching activities and the client experience. This guide aims to support whale-watching operators along Canada's east coast in their marine mammal conservation efforts, both to ensure the sustainability of their activity and the well-being of the animals. These companies will thus be able to further contribute to the economic, social and environmental well-being of their communities.



Whale-watching tour © S. Giroux, MMON

A Changing Environment

Offshore whale watching is affected by disturbances to ocean ecosystems as well as climate change. Rising water temperatures as well as shifting ocean currents trigger changes in whale distribution and migratory patterns,[1,2] often driving the animals out of protected areas and exposing them to greater risk. As is the case with meteorological events, their occurrence in a given sector is becoming increasingly difficult to predict. Acidification and deoxygenation of the seas have far-reaching consequences on the food chain and cause shifts in the areas used by foraging whales, which ultimately alters how offshore whale-watching activities are practised. Changes in ocean chemistry and temperature can also affect sound transmission and in turn the animals' ability to communicate. In recent years, variations have been observed in the presence of several species along Canada's east coast. Large cetaceans such as the blue whale, North Atlantic right whale, and humpback whale are amongst the most vulnerable species to climate change.[3,4,5]

Harp seals on the pack ice © C. Poirier, MMON

Chapter 1.

WHALE WATCHERS AND WHALES

Observation of a humpback whale © M. Martel, MMON

Important Habitats for Marine Mammals

The St. Lawrence is home to a large number of rich and highly diverse ecosystems. From its source in the Great Lakes, the river flows over 3,260 kilometres before emptying into the Atlantic Ocean. It is at once a freshwater river, an estuary characterized by a mix of fresh and salt water and the presence of tides, as well as a gulf that can be defined as a semi-enclosed sea. Below the water surface lie canyons, trenches, channels and shoals over which pass marine currents responsible for the mixing of waters and upwelling zones.[6] Influenced by the tides, these dynamic currents stimulate the entire food chain and attract the giants of the oceans. Indeed, the St. Lawrence is home to a number of whales, several of which are migratory species that concentrate their feeding activities in these cold, productive waters to stock up on their energy reserves. It is a critical environment for a large number of at-risk species.

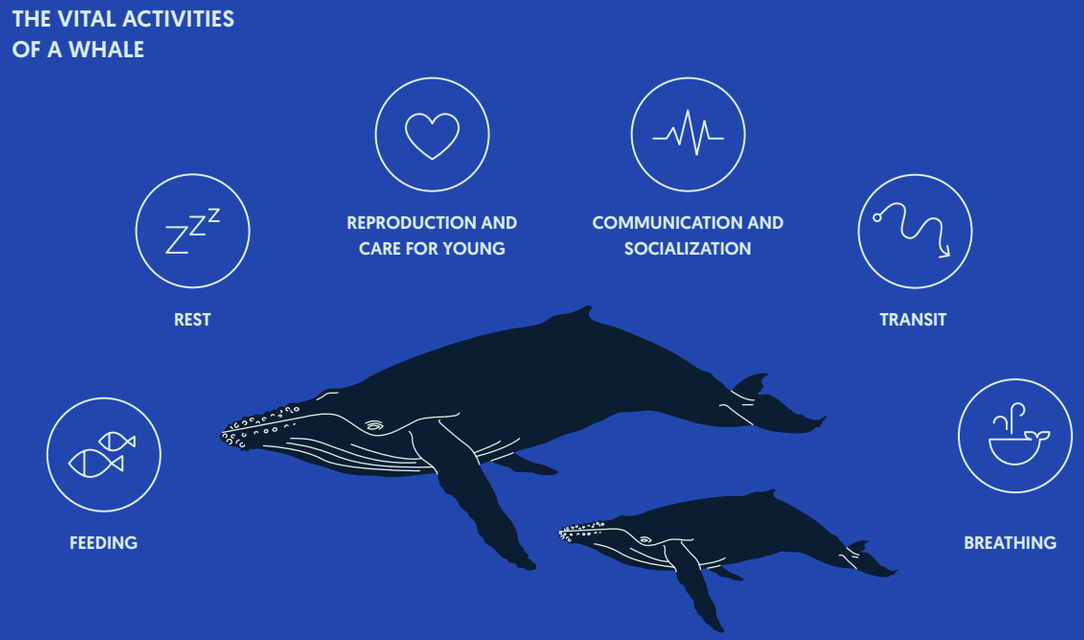
To protect these exceptional ecosystems, a number of marine protected areas (MPAs) have been created at strategic locations in the St. Lawrence. As the first MPA jointly managed by the governments of Quebec and Canada, the Saguenay-St. Lawrence Marine Park was established in 1998, notably with the aim of bolstering the protection of marine ecosystems, including part of the St. Lawrence beluga's summer range. In its current boundaries, the Marine Park also covers the main concentration areas identified in the St. Lawrence Estuary for fin, humpback and minke whales.[7]

More recently, the Banc-des-Américains joint MPA was established with a dual status of protection, namely as a marine protected area created by the Government of Canada in 2019 and an aquatic reserve established by the Government of Quebec in 2021. In addition to ensuring the protection of a unique underwater topography, this MPA aims to foster the productivity and diversity of the fishery resources that frequent the American Bank and adjacent plains as well as the recovery of species at risk. MPAs must ensure that no activities are practised that are incompatible with its conservation objectives. For this reason, they may notably ban industrial and some commercial activities while regulating other activities such as whale watching. Cohabitation throughout the region is also of utmost importance to ensure long-term biodiversity, including fishery resources and cetacean populations, and, at the same time, the sustainability of whale-watching activities.

Fin whale in the Saguenay-St. Lawrence Marine Park
© S. Giroux, MMON

The Importance of Space and Quiet for Marine Mammals

Marine mammals need to come to the surface on a regular basis to meet one of their primary needs which is to breath. They require space not only to breath but also to carry out their vital activities in peace. Getting too close when trying to observe them can cause the animals stress and trigger avoidance behaviours, which cuts into their feeding and resting time. Watching them from a sensible distance lowers the risk of collision and injury. Approach distances vary depending on where one is in the Gulf of St. Lawrence or St. Lawrence Estuary as well as the presence of females accompanied by their calf, animals at rest, or species with a special status under the *Species at Risk Act*.



Blue whale © C. Dupasquier, MMON

Underwater noise levels in the environment have doubled every decade since the middle of the 20th century, mainly due to increased maritime traffic, including cargo ships as well as smaller watercraft.[8] Increasingly present in marine ecosystems, underwater noise affects whales in their daily activities. Whales rely much more on their hearing than they do their vision, as light conditions below the surface are often too poor to see. For this reason, whales have developed an enormous variety of complex sounds that differ significantly from one species or population to another and that serve rather diverse purposes.

Sound travels better through water than it does through air. Some sounds are used for orientation, others to locate prey, communicate or even avoid certain dangers such as predators or ships. Using sound to carry out its activities can prove difficult when multiple other noise sources are present. This is notably the case in the presence of watercraft that produce a multitude of sounds that travel through the water and mask those emitted by whales, inhibiting the animals' ability to adequately detect the vocalizations of members of their own species or their acoustic environment in general.

Offshore Whale-watching Activities as a Source of Disturbance

The sustainability of whale-watching activities depends on the health of the targeted marine mammal populations. The best way to protect them during their stays in our waters is to minimize the sources of disturbance in their environment and to avoid interrupting their vital activities.

"A disturbance is detected if a behavioural change is perceived in the short or long term."[9]

COLLISION

Marine mammals are exposed to a number of risks and disturbances in their breeding grounds, during their migrations and upon their arrival in the Gulf of St. Lawrence and its estuary. Although collisions with cetaceans are often associated with large ships, they may also occur with small recreational watercraft or whale-watching vessels, posing risks to humans and marine mammals alike.[10] Following a collision, a marine mammal may initially appear to swim normally, but may succumb to internal injuries at a later time. Thanks to the manoeuvrability of small watercraft, the crews of such craft are more easily able to avoid a potential collision by reducing their speed and by designating a crew member to stand watch.[11] In the presence of a large number of boats, certain species will use avoidance tactics such as changes in direction. These unpredictable changes combined with the speed of the boats increase the risks of collision.

Are you familiar with the sentinel effect? In 2022, researchers in British Columbia noted that the presence of whale-watching boats played a role in the reduction of incidents between pleasure boaters and killer whales. Indeed, the researchers noted that whale-watching vessels had a positive effect on the behaviour of recreational boaters. This was the first study to confirm the sentinel effect.[12]

POLLUTION

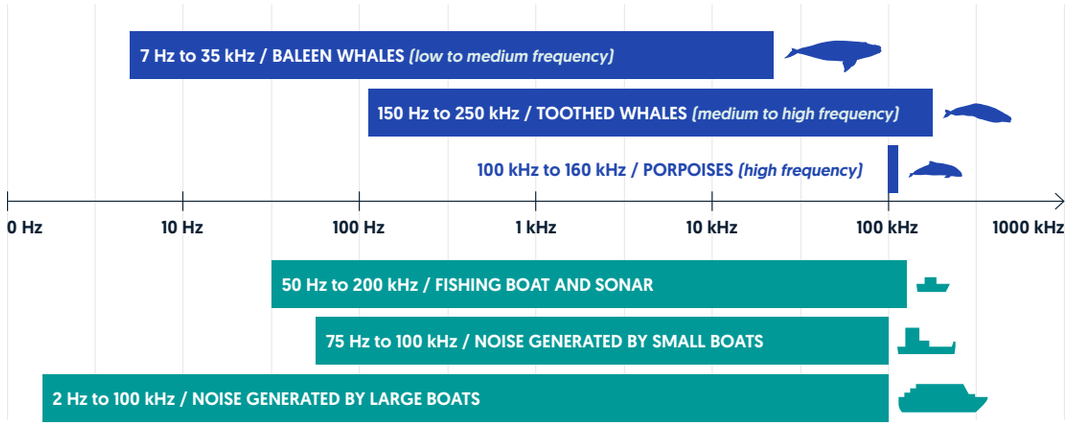
Boats, engines and equipment must be well maintained and operated in such a way as to minimize both dirty emissions and underwater noise. Whale-watching operators should also ensure that nothing is thrown overboard during their offshore excursions. It is critical not to further degrade marine mammal habitat, which is already affected by the presence of plastics, microplastics and toxic waste.[13,14]

UNDERWATER NOISE

With its significant spatial and temporal presence in feeding areas and in proximity to cetaceans, the noise generated by whale-watching boats is the main source of disturbance for marine mammals,[8] and is even more important than the proximity of these boats. In fact, even the noise generated by a single whale-watching boat can interfere with the rest and communication of certain species.[15,16] The greater the number of watercraft present, the more likely it is that the noise produced will constitute a disturbance and trigger a behavioural change in the cetacean being observed.[9] In this regard, the use of a stimulator to analyze the behaviour of captains in the Saguenay-St. Lawrence Marine Park led to the conclusion that reducing boat clusters improves visitor experience while mitigating impacts on cetaceans and increasing the number of sightings.[17]

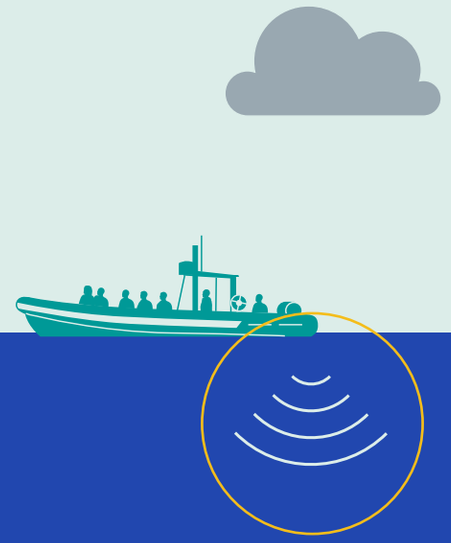
For whale-watching operators, the impact of engine noise on marine mammals can be mitigated any number of ways. Examples notably include reducing watercraft speed to less than 10 knots,[18] minimizing sudden changes in speed, maintaining an adequate distance from the animals and limiting the amount of time spent in their proximity. Noise mitigation measures for whale-watching fleets include the use of larger, slower propellers to reduce cavitation, switching to quieter engines (e.g. electric), and installing noise-absorbing equipment. Whale-watching staff can maintain their propellers and verify the presence of cracking and chipping to ensure that their boats are operating efficiently and without excessive cavitation.[8]

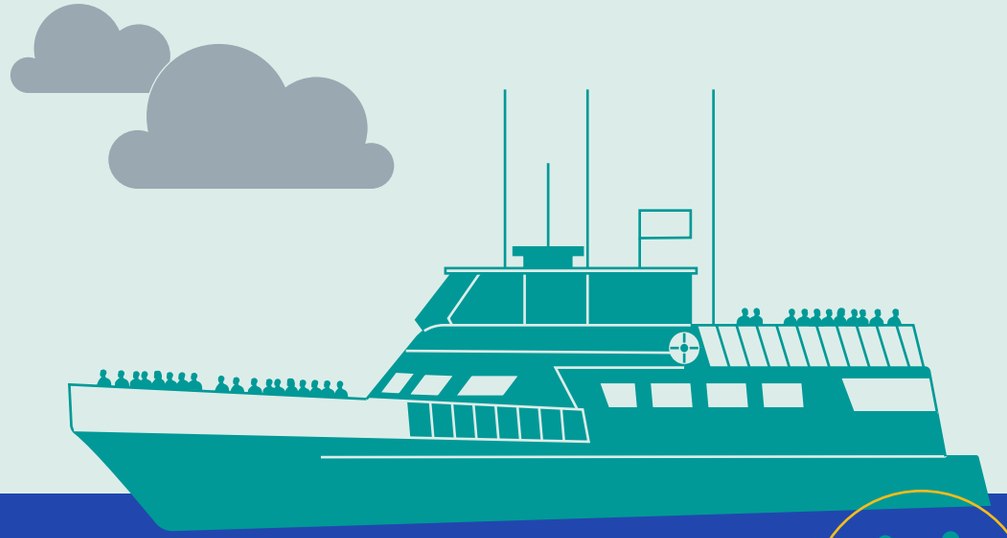
OVERLAP OF BOAT-GENERATED NOISE AND THE HEARING RANGE OF CETACEANS



DISTURBANCES RELATED TO OFFSHORE WHALE-WATCHING ACTIVITIES AND THEIR IMPACTS ON MARINE MAMMALS

The recurrent presence of watercraft in the vicinity of whales generates cumulative effects that, when combined with other environmental factors, can have long-term consequences on the animals' health and physiology. Any change in whales' behaviour or the way they use their habitat can have impacts on the survival of individuals or a population, or even the health of the entire ecosystem.





HIGH SPEED

The faster the boat, the louder the noise and the higher the risks of fatal collision or severe injury.[10,18,20,21]

NOISE POLLUTION

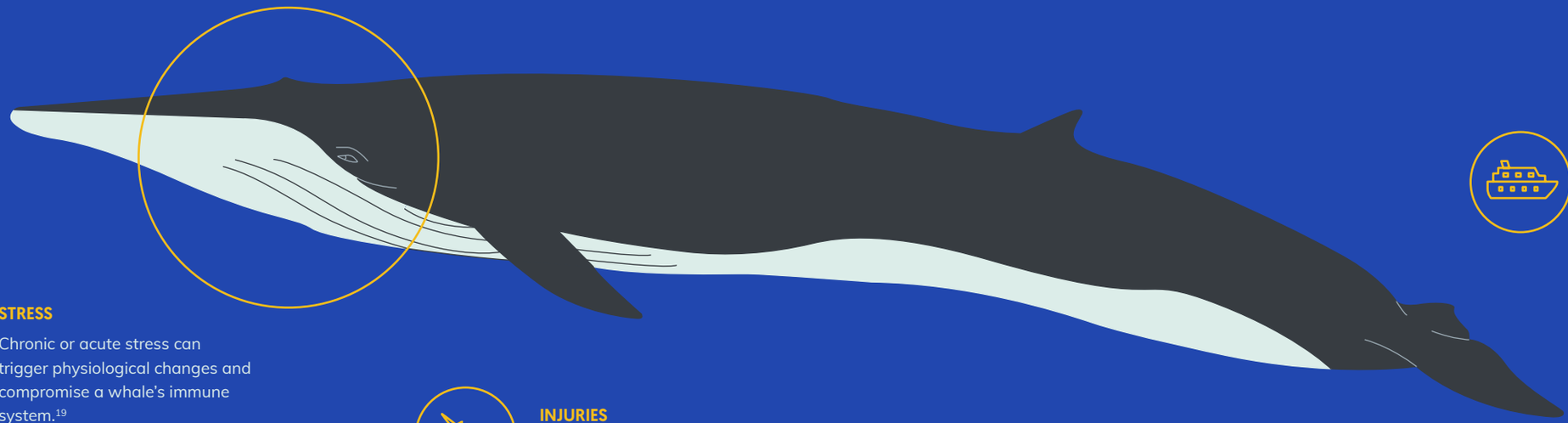
Noise pollution creates stress and disturbs whales in the performance of their vital activities.[22,23]

NUMBER OF BOATS

The more boats are present, the greater the disturbance and stress for the whales.[19,24]

MARINE POLLUTION AND GARBAGE

Pollution from combustion engines and trash that enters the sea can be harmful to a whale's health.[13,14]



STRESS

Chronic or acute stress can trigger physiological changes and compromise a whale's immune system.[19]

INJURIES

Marine mammals can die following collisions or be weakened by their injuries.

BEHAVIOURAL CHANGES

The presence of boats can lead to behavioural changes in terms of dive time, breathing sequences as well as how the animals communicate and feed.[23,24]

Fin whales in the Gulf of St. Lawrence
© M. Martel

Regulatory Measures for Marine Mammal Protection in Canada

In Canada and elsewhere in the world, a number of research projects have focused on mitigating the impacts of offshore whale-watching activities in an effort to develop optimum management policies. As regulations are subject to change, especially from one season or geographic area to another, it is recommended to consult the Whale-Watcher's Portal of the Navigating Whale Habitat platform for the most up-to-date information.

Fisheries and Oceans Canada's Marine Mammal Regulations for observing and approaching whales and other marine mammals stipulates a minimum distance of 100 metres throughout Canada to legally protect these animals from human disturbance. Stricter regulations may apply in certain sectors (e.g. marine protected areas) depending on the species present and the activities carried out there. The aforementioned regulations make it unlawful to disturb marine mammals. Disturbance notably refers to approaching a marine mammal with the intention to perform or attempt to perform any of the following actions:

- Feeding it;
- Swimming or interacting with it;
- Moving it from the immediate vicinity, luring it or coaxing it to swim in one direction or another;
- Separating it from members of its group or coming between a marine mammal and its young;
- Positioning a boat so as to corner the animal or its group between a boat and the coast or between multiple boats.
- Tagging or marking it.

Gauging distance at sea

Governments have adopted a regulation on marine mammal approach distances, as these animals require space and quiet to adequately carry out their vital activities. Below is a guide that can be used to judge distances more easily.

Humpback whale and whale-watchers © MMON

GUIDE TO ESTIMATING DISTANCES AT SEA

100
METRES
=

12 ZODIACS CARRYING 20 PASSENGERS OR +
8,5 to 9 m long

20 KAYAKS
5 m long

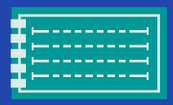
200
METRES
=

20 SAILBOATS
10 m long

13 SEMI-TRAILER TRUCKS
15 m long

400
METRES
=

3 CARGO SHIPS
130 to 170 m long



8 OLYMPIC POOLS
50 m long

Chapter 2.

WHAT YOU CAN DO

Captain Olivier Cloutier, Cap Aventure © É. Williamson

Role of Whale-watching Companies in Whale Conservation and Public Awareness Raising

Whale-watching companies face a two-pronged challenge, namely to ensure the economic viability of their activity and satisfy their clientele while at the same time participating in whale conservation. It has been shown that carrying out the activity in an environmentally-friendly manner increases both sustainability as well as customer satisfaction. Visitors are taking an increased interest in whale conservation and are beginning to better understand the importance of maintaining a reasonable distance. The reputation of a destination can also be adversely affected by offshore conduct that is harmful to marine mammals.

Wildlife observation tourism is a tool of choice for implementing species protection and conservation measures, especially if interpreter guides integrate the cornerstones of these measures into their discourse.[9] This is especially the case for marine mammals, which are widely enjoyed by the general public for their charismatic nature. Customer satisfaction increases when the interpreter's narrative on board the boat emphasizes the importance of whale conservation measures and the regulations are properly understood and complied with.[15] Over the long term, education and interpretation foster environmentally-friendly attitudes and changes in human behaviour.[25] Interpreter guides are ideally positioned to contribute to this change by sharing their passion for whales with cruise participants and informing them of the dangers faced by cetaceans.

THE ESSENTIAL ROLE OF THE NATURALIST

Whale-watching tour operators can make a contribution to research, conservation and public education while improving the passenger experience in different ways:

BEFORE THE EXCURSION

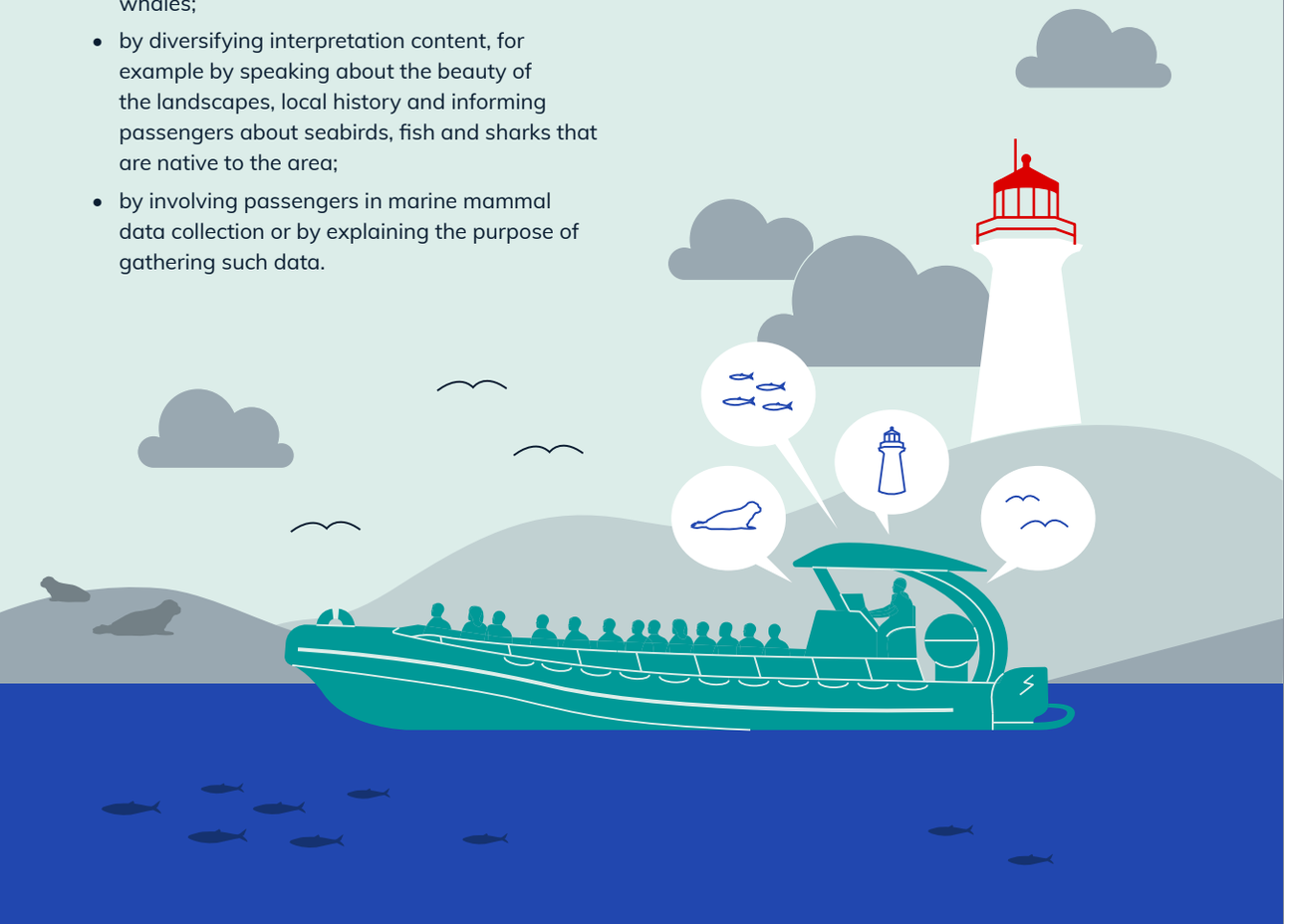
- by showing videos or putting up posters on best practices, conservation issues, and boating regulations in whale habitat;
- by tempering passenger expectations prior to boarding;
- by sharing eco-friendly images, for instance by not publishing photos showing whales in close proximity to a boat.

DURING THE EXCURSION

- by explaining the impacts of disturbance on whales;
- by diversifying interpretation content, for example by speaking about the beauty of the landscapes, local history and informing passengers about seabirds, fish and sharks that are native to the area;
- by involving passengers in marine mammal data collection or by explaining the purpose of gathering such data.

AFTER THE EXCURSION

- by distributing or making available educational material;
- by informing passengers on different ways to get involved in marine mammal and ocean conservation;
- by helping clientele develop into skilled observers and ambassadors of ocean and biodiversity protection.



Pillars of Responsible Observation

Compliance with Best Practices + Education = Conservation

According to the Convention on Migratory Species signed under the auspices of the United Nations Environment Programme (UNEP), observation activities should not have negative repercussions on the long-term survival of populations and their habitats and should have minimal impact on the behaviour of the animals being observed.

Responsible whale watching implies conscientious communication and promotional activities and begins before passengers even board the vessel. The naturalist weighs his or her words in a way that tempers participants' expectations while emphasizing the importance of a wildlife-friendly approach. Pressure on marine mammals is lessened when the naturalist includes in his or her narrative elements of the landscape and other species such as seabirds.

Whale-watching operators and their interpreting crews have prime access to a clientele that is eager to learn more about marine mammals and their habitat. To participate in marine mammal conservation, they must adopt best boating practices and educate their clientele on the issues that they face. By doing so, they can contribute in different ways to scientific research, awareness and customer satisfaction.

HOW TO ACT IN THE PRESENCE OF MARINE MAMMALS

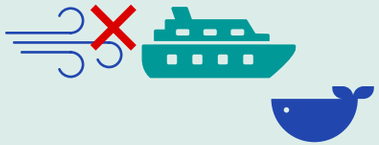
The impacts of watercraft can be mitigated by adopting responsible boating practices when in whale and seal habitat. Your observations will be all the more rewarding for your visitors if the whales have ample space to carry out their vital activities.

1. Properly inform clientele of the rules that have been put into place prior to departure and throughout the excursion and explain why compliance with such rules is important in order to temper any unrealistic expectations tourists might have.

2. Comply with applicable regulatory distances in the sector being explored.

3. Make approaches at an angle (as opposed to head on, perpendicularly or from behind) and parallel movements, while always maintaining an appropriate distance.

4. Do not use the wind, current, or waves to approach whales any closer than what is allowed by regulations.

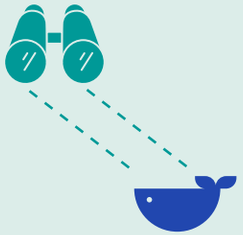


5. Avoid making sudden changes in speed or direction.

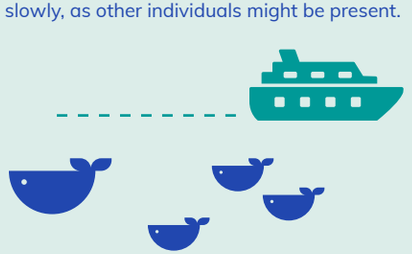
6. Reduce speed to under 10 knots in the presence of whales in order to mitigate the risk of fatal collision with an animal while reducing greenhouse gas emissions and underwater noise.

7. Limit observation time to 30 minutes or less around any given individual to minimize disturbance and allow it to go about its vital activities.

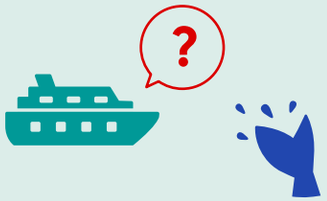
8. Keep an eye on the animal's position, do not make any manoeuvres if you do not know where it is, and wait until you see it above the water surface before moving.



9. Remain alert and leave the observation zone slowly, as other individuals might be present.



10. Know how to recognize disturbance behaviours and remain alert.



11. Do not seek out endangered whales (beluga, blue whale, North Atlantic right whale) and, if possible, maintain a distance of 400 m if you encounter one or more representatives of these species.

Learning to Recognize Signs of Disturbance in Whales

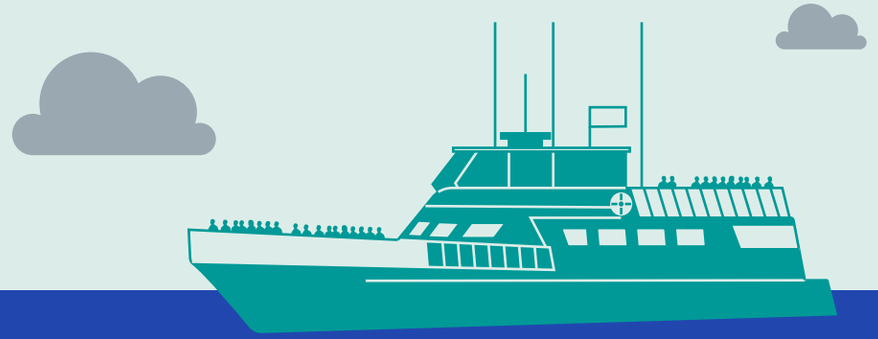
The proximity of whale-watching boats and the noise they generate can trigger behavioural changes in cetaceans. The most frequently observed and documented changes are less time feeding and resting and more time on the move.[23,24] This can translate into a negative energy balance, making the animals more vulnerable. Even if these changes in behaviour are difficult to detect from on board a boat, it is important to be aware of them when marine mammals are being approached on a regular basis, as over the long term, these changes have an impact on the health of both individuals and populations.

One of the most common avoidance behaviours is veering off course and less linear trajectories,[24] making it more difficult to predict where the whale will next surface and meaning it will take the animal longer to cover the same distance. The cetacean may also increase or decrease its speed, for example to swim away or because it is struggling to communicate with its peers due to underwater noise.

The number and types of boats as well the species (and sex) of the animals observed will influence the avoidance behaviours used. Studying these behavioural changes is highly time and resource intensive. Although it is difficult to understand what motivates animals that live under water, a number of indicators can help determine when whales are disturbed:

- Sudden changes in swimming direction or speed;
- Change of behaviour midway through or at the end of their activity;
- A reduction in their breathing sequence and time spent at the surface;
- An increase or decrease in their dive time;
- Changes in the level of cohesion or size of a group of individuals;
- Change in their acoustic behaviour (underwater vocalizations);
- Repetitive above-water demonstrations such as pectoral fin slapping or vocalizations, grunting or roaring, for example.

In addition to following applicable regulations and best practices, captains should draw from their experience at sea to try to analyze situations and minimize the impact of their presence on the water.



Does the animal appear to have altered its behaviour since the boat arrived?

Does it seem to be exhibiting avoidance behaviour?

Have the same individuals been observed over extended periods and in the presence of multiple other boats?

Indicators of Disturbance in Seals

The main response of seals when faced with a disturbance is to leave the area. Once the first seal flees, there is often a ripple effect across the rest of the herd.[26] The following behavioural responses to onshore or offshore disturbance have been studied at three different colonies in Forillon National Park:[27]

CURIOSITY
Movement toward the disturbance

VIGILANCE
Surveillance of intruders

CHANGE OF POSITION
Waddling, change of orientation

RETREAT
Movement away from the disturbance

RETURN TO WATER / FLEE
Movement from land to water

AGGRESSION
Vocalizations, threatening behaviour

Grey seals on alert or in the water © S. Pieddesaux, MMON

Harbour seal on alert © J. Linossier, MMON

Harbour seals on alert or fleeing © J. Linossier, MMON

Contributing to Science through Knowledge Acquisition

The marine mammal species that inhabit eastern Canada do not restrict themselves to specific sectors. Rather, they use large swaths of territory and take no heed of provincial or international borders. These are populations that will often move on an east-west or north-south axis and that undertake long migrations. Understanding their distribution and use of maritime habitat is fundamental to properly monitor them and to lower the risk factors that could endanger them. Continuous monitoring is essential to be able to recognize early warning signs that a species may be in decline before it is too late.[28] To do so, scientists require large quantities of reliable data that cover a sufficiently large territory and provide an overview of species distribution. For most North Atlantic species that are present in Canada, there is still a shortage of basic data to properly assess the status of populations since commercial whaling was banned in 1986.[29] This lack of information on population abundance undermines conservation efforts. In recent years, the scientific community has taken a greater interest in opportunistic and citizen data, which it considers useful for plugging gaps in traditional research. This is notably the case with cetaceans, as the expanse to be monitored is simply too vast for scientists to shoulder the responsibility alone.[30]

Photo of a new individual identified when it arrived in Gaspé in June, again in August, and from September through the end of October 2023 in the Saguenay-St. Lawrence Marine Park. © GREMM

Whale-watching operators in the Gulf of St. Lawrence and its estuary already participate in whale conservation in different ways, whether it be by integrating an educational, awareness-raising discourse into their interpreting activities or by participating in knowledge acquisition programs. Captains and naturalist guides contribute to science by taking photos of marine mammals and sharing them with research organizations or by collecting observation data during their outings. Some of these staff are quite adept in identifying individual whales that regularly visit our waters. This contribution is invaluable to understanding the dynamic nature of ecosystems and ensuring the sustainability of the industry.

Data collection using the Vigie Marine application
© S. Giroux, MMON

Emergency networks: reporting marine mammal carcasses or animals in difficulty

In the course of your whale-watching activities, you may encounter a drifting carcass or an animal in difficulty, especially following a collision with a ship for example. In the event of an entangled whale or other marine mammal, the best approach for your own safety is to not attempt to set the animal free, but rather to report the incident immediately (to the Quebec Marine Mammal Emergency Response Network if in Quebec, or to the nearest emergency network if outside the province) so that a certified group of responders can organize a rescue operation. Certified responders have specialized know-how, equipment, training and experience that allow them to properly assess the entanglement and ensure that the material is removed in such a way as to maximize the whale's chances of long-term survival. To report a collision with a marine mammal within the Saguenay-St. Lawrence Marine Park, contact a Parks Canada warden.

In Quebec, whale-watching operators may also volunteer with the Quebec Marine Mammal Emergency Response Network.

IF YOU SEE A YOUNG SEAL ON SHORE, IT IS IMPORTANT TO:

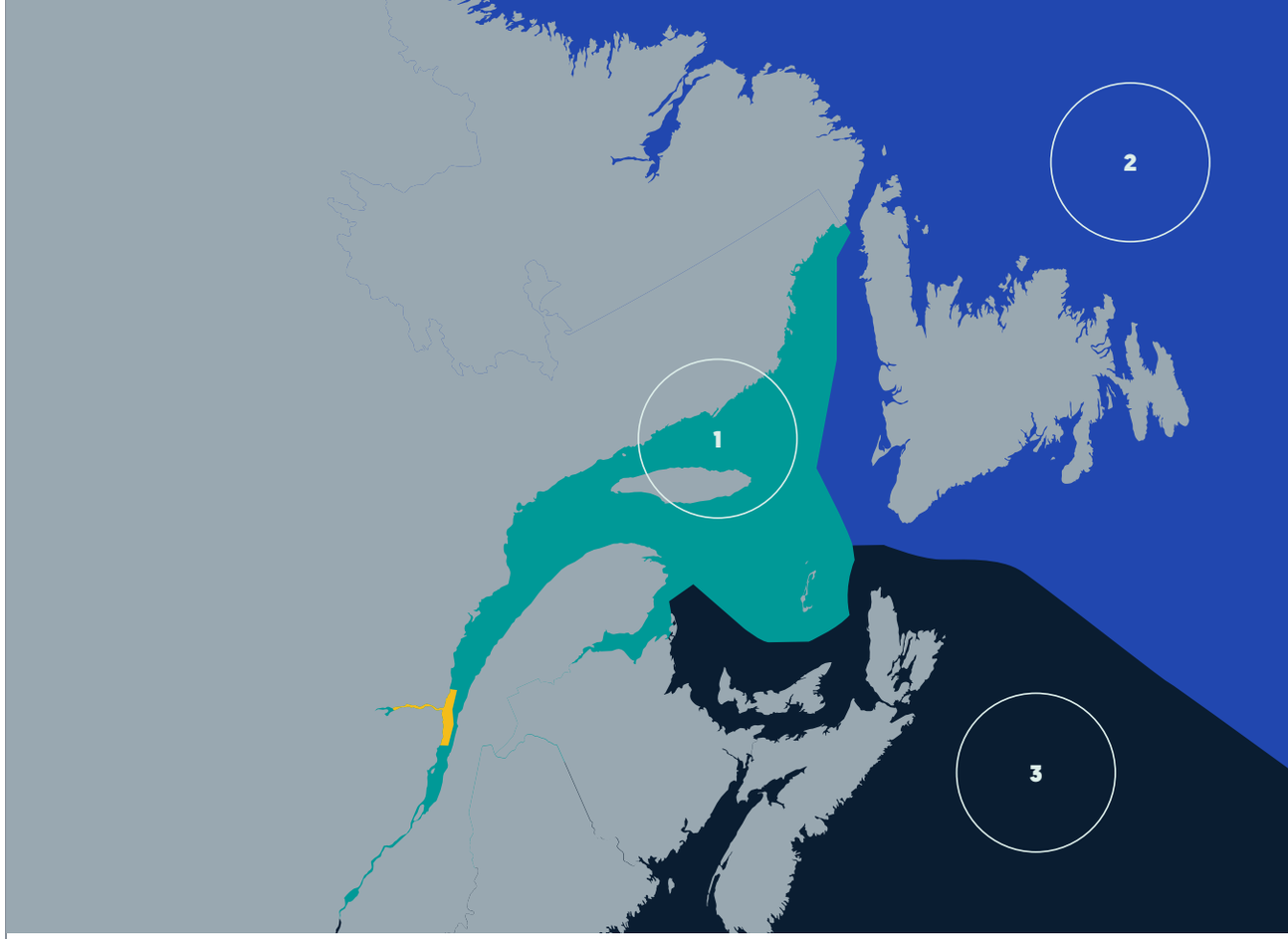
- Keep your distance;
- Keep pets away;
- Refrain from touching or handling the animal;
- Refrain from feeding it.

If the young seal is not yet weaned, its mother is probably in the water nearby waiting for the next high tide to return to her offspring.

However, if you see a seal lingering on a beach in proximity to humans without returning to the water for more than one tidal cycle, the animal could be vulnerable. In this case you should contact the marine mammal emergency network for your sector.

WHAT SHOULD YOU DO IF YOU SEE AN ENTANGLED WHALE?

1. It is against the law to attempt to rescue a marine mammal on one's own.
2. Remain with the animal while maintaining a safe, regulatory distance.
3. Immediately report any injured, distressed or dead whale.
4. Take photos and/or videos of the fishing gear and the entangled whale.



SAGUENAY-ST. LAWRENCE MARINE PARK

1. **QUEBEC**

For collisions within the boundaries of the Saguenay-St. Lawrence Marine Park
1-866-508-9888

Elsewhere in Quebec:
For stranded, entangled, injured or dead animals
Quebec Marine Mammal Emergency Response Network
1-877-722-5346

2. **NEWFOUNDLAND AND LABRADOR**

Whale Release and Strandings
1-888-895-3003

3. **NOVA SCOTIA, NEW BRUNSWICK AND PRINCE EDWARD ISLAND**

Marine Animal Response Society
1-866-567-6277 ou VHF 16

Chapter 3.

MARINE MAMMALS OF THE CANADIAN EAST COAST SECTOR

Cetacean activities most sensitive to disturbance vary from one species to another, but often relate to feeding and rest.[23,24,31] Disturbance of these vital activities can cause the animals to stop frequenting a given sector, which in turn affects an industry that is highly dependent on their presence. The sustainability of whale watching as an activity is closely linked to how cetaceans react to the proximity of watercraft. This section of the guide presents species descriptions and interesting factoids for interpreter guides, in addition to discussing the specific vulnerabilities of the cetaceans that frequent our waters.

Whales are divided into two groups: baleen whales and toothed whales. For whales and seals, the species are presented as follows:

ENGLISH NAME

FRENCH NAME

SCIENTIFIC NAME

This is a universal designation used to identify an animal species.

OTHER NAMES

Commonly used vernacular names used to identify a species.

POPULATION

The population of an animal species indicates a specific group of individuals of the same species within a given geographic area.

STATUS

Status is an indication of the level of vulnerability, which is determined as a function of various factors and is attributed to the species or population by the **Committee on the Status of Endangered Wildlife in Canada** and/or under the *Species at Risk Act* (SARA).

VULNERABILITY

Reasons for which the species is particularly sensitive to human activities.

PHYSICAL DESCRIPTION

Includes the most diagnostic physical traits used to identify a species. Photographs are presented to facilitate identification.

BEHAVIOUR

This section presents some of the characteristic behaviours of each species that can be used to support identification.

Fin whale © M. Martel

Species at Risk

Many of Canada's whale species are considered to be at risk. Heavily hunted at the start of last century, certain populations have severely declined and are struggling to reach their former numbers, notably due to low reproduction rates. Even if whales are no longer widely hunted, a number of natural and anthropogenic factors are compromising the recovery of the most affected populations. Of the 14 whale species in the Northwest Atlantic presented in this guide, seven are considered to be at risk in Canada and half are protected under the *Species at Risk Act* (SARA).

Vessel strikes, underwater noise, pollution and other ship-related disturbances that can cause whales to abandon a given habitat (e.g. a prime feeding ground) have been identified as significant threats for many at-risk whale populations. The following pages will help provide a better understanding of these impacts and what mariners can do to minimize them while actively participating in whale conservation, notably for those species at risk.

Status attributed to whales of the North Atlantic under the *Species at Risk Act* and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2024.

Visit the Government of Canada's Species at Risk Public Registry for the most up-to-date information.

SPECIES OF CONCERN

Wild species that could become threatened or endangered due to the cumulative effect of its biological characteristics and the threats it faces.

FIN WHALE, KILLER WHALE, HARBOUR PORPOISE

THREATENED SPECIES

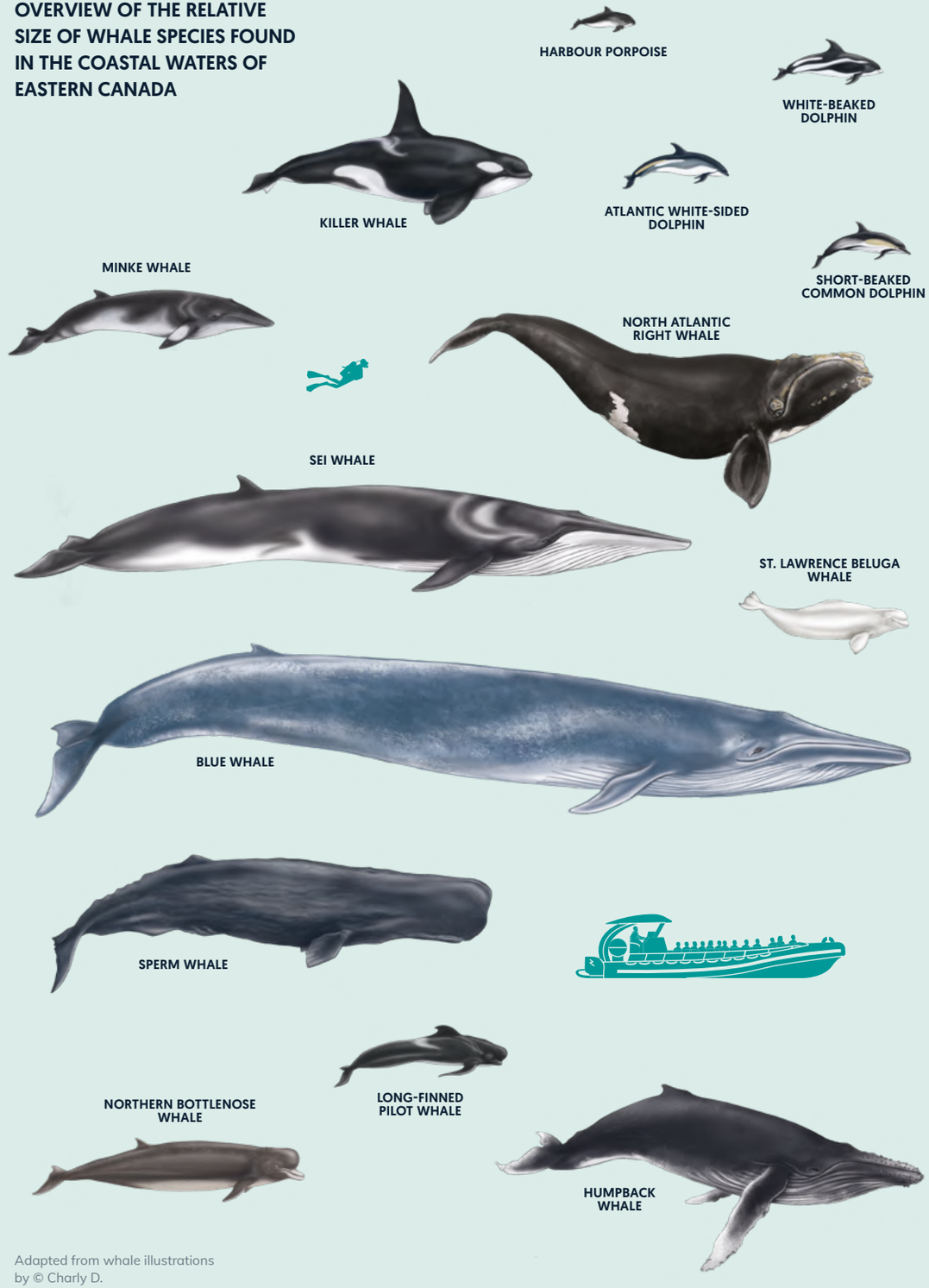
Wild species that could become endangered if nothing is done to reverse the factors contributing to its extirpation from the country or its outright extinction.

ENDANGERED SPECIES

Wild species that is at imminent risk of being extirpated from the country or becoming completely extinct.

NORTH ATLANTIC RIGHT WHALE, BLUE WHALE, ST. LAWRENCE BELUGA, NORTHERN BOTTLENOSE WHALE

OVERVIEW OF THE RELATIVE SIZE OF WHALE SPECIES FOUND IN THE COASTAL WATERS OF EASTERN CANADA



Adapted from whale illustrations by © Charly D.

Fin whale surface feeding © A. Savoie, MMON

Minke whale surface feeding © A. S. Sean, MMON

Baleen Whales

Baleen whales, also known as baleen cetaceans or mysticetes, have no teeth, but rather horny plates attached to their upper jaw called “baleen,” which they use like a filter when they feed. Baleen whales feed on zooplankton, which consists of tiny organisms such as krill and copepods, as well as small fish such as capelin, herring and sand lance. They possess two orifices on the top of their head called blowholes, which they use to breath at the water surface. The species in this group are generally larger than toothed whales.

Baleen whales: Feeding humpback whale © Sutterstock, MMON

Baleen Whales

NORTH ATLANTIC RIGHT WHALE

English name **NORTH ATLANTIC RIGHT WHALE**

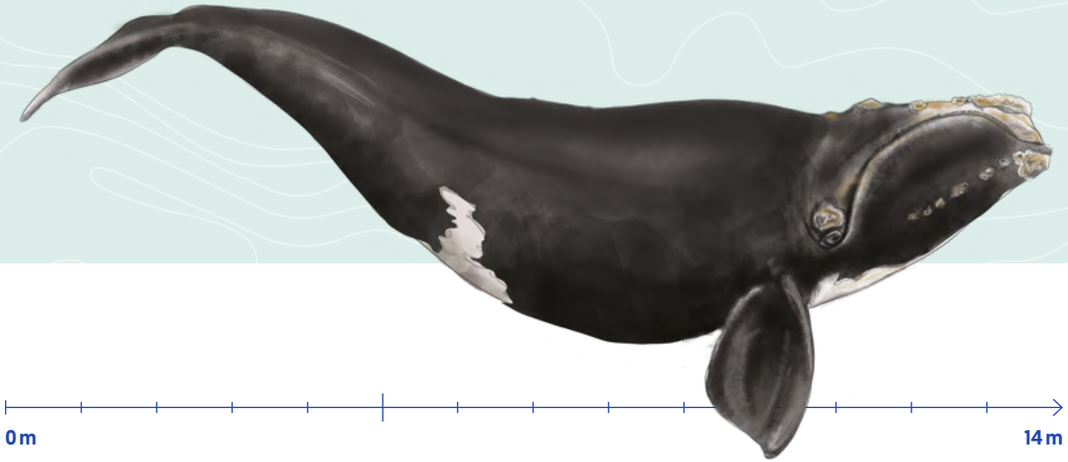
French name **BALEINE NOIRE DE L'ATLANTIQUE NORD**

Scientific name ***EUBALAENA GLACIALIS***

Other names **NORTHERN RIGHT WHALE, BLACK RIGHT WHALE**

Population **NORTH ATLANTIC**

SARA status **ENDANGERED**



© Charly D.

The North Atlantic right whale is one of the most critically endangered cetacean species in the world. It can reach lengths of 13 to 17 metres and weigh between 30 and 70 tonnes. The right whale is a slow swimmer (5-8 km/h) and feeds near the water surface, making it highly prone to collisions with ships.

VULNERABILITY

With an estimated population of fewer than 350 individuals in 2022, the North Atlantic right whale population has been decimated by commercial whaling. There are believed to be fewer than 70 females of reproductive age and births are rare. Population growth is also strongly constrained by entanglements in fishing gear and collisions with ships,[32] including whale-watching boats. It is therefore important to observe regulatory distances, reduce the speed of one's watercraft and, ideally, move away. Since 2015, right whales have been identified much more frequently in the Gulf of St. Lawrence,[33] which explains the measures put in place by the Canadian government to protect the species.

PHYSICAL DESCRIPTION

- The right whale's V-shaped spout can reach 5 m high. This diagnostic trait is shared by both the right whale and the bowhead whale, though the latter is generally found farther north.
- Right whales have a black back and a dark belly that sometimes shows white spots. One unique characteristic of this species are the white or yellowish callosities on the head and chin.
- The dorsal fin is absent.
- The Y-shaped tail is entirely black.

BEHAVIOUR

- The tail is nearly always visible when the animal dives.
- Right whales are observed alone or in groups of variable size.
- They are capable of breaching and lifting their squarish pectoral fins out of the water.

© S. Giroux, MMON

© S. Giroux, MMON

DID YOU KNOW THAT...

North Atlantic right whales visit the St. Lawrence every year from early spring to early winter in search of their prey of choice, zooplankton? Their favourite zooplankton are copepods, tiny crustaceans measuring a mere 8 millimetres long that feed the entire food chain, from fish larvae to large whales. The cold-water copepods found in the gulf are rich in lipids, which provides right whales with the energy they need to stock up on their fat reserves. They can consume up to 1,100 kilograms[34] of these tiny organisms daily.

Copepod © Uwe Kils, CC BY-SA 3.0, Wikimedia Commons

Baleen Whales

BLUE WHALE

English name	**BLUE WHALE**
French name	**RORQUAL BLEU**
Scientific name	***BALAENOPTERA MUSCULUS***
Other names	**SIBBALD'S RORQUAL, GREAT BLUE WHALE, GREAT NORTHERN RORQUAL**
Population	**ATLANTIC**
SARA Status	**ENDANGERED**

Measuring 20 to 28 metres long and weighing between 73 and 136 tonnes, the blue whale is the largest animal to have ever roamed the planet. It can devour 10 to 20 tonnes of krill a day.[35]

VULNERABILITY

The Atlantic blue whale population is endangered, having been decimated by intensive whaling before the latter was outlawed in 1955. Based on the mark-recapture model, an estimated 150 to 200 individuals of the Northwest Atlantic sub-population can be found in the St. Lawrence Estuary, where observations are the most frequent and reliable.[36] At the current time, the blue whale is exposed to other threats to its recovery, notably changes in prey availability, anthropogenic noise, entanglements in fishing gear and collisions with ships.[4] In fact, studies have revealed a correlation between ship proximity and behavioural changes such as fewer breaths at the surface as well as changing patterns in dive duration and depth of feeding blue whales.[16,37]

PHYSICAL DESCRIPTION

- The blue whale's spout is powerful, very loud, wide and vertical. It can spray over 6 metres high, meaning it can be seen up to several kilometres away.
- The back is greyish blue and is speckled or marbled.
- The dorsal fin is small compared to the overall size of the animal and is set far back on the body. It is clearly visible, especially when the whale arches its back to dive.
- The tail is broad and T-shaped, and can be seen in approximately 15% of all dives.

BEHAVIOUR

- Though typically solitary, blue whales can occasionally be seen in pairs or in small groups. When food is particularly plentiful, groups numbering up to 25 or 30 individuals can be observed.
- It keeps its distance from boats and rarely shows any interest in them.

© M. Martel

© M. Martel

DID YOU KNOW THAT...

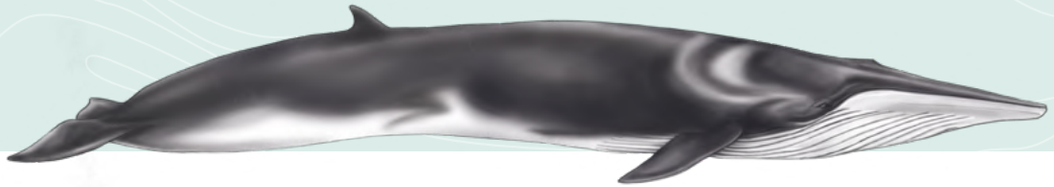
a blue whale can consume an impressive quantity of food every day? In fact, a single individual can consume 10 to 20 tonnes of krill daily;[35] this rich food source contains 20 to 50 million calories.[35] Being the giant it is, the blue whale has commensurately enormous organs: its heart weighs approximately 180 kilos, its tongue around 3 tonnes and its liver, 1 tonne. Newborns already measure 7 metres long and weigh 2.5 tonnes![38] Nursing calves consume huge quantities of fat-rich milk, which allows them to gain 90 kilos a day, or 3 to 4 kilos an hour!

Animals frequenting the St. Lawrence Estuary spend 22 hours a day feeding. This activity takes place mainly between dusk and noon the following day. For this reason, afternoon outings might help minimize disturbance to feeding whales.[37]

Baleen Whales

FIN WHALE

English name	**FIN WHALE**
French name	**RORQUAL COMMUN**
Scientific name	***BALAENOPTERA PHYSALUS***
Other names	**FINBACK WHALE, COMMON FINBACK, FINNER, RAZORBACK, FLATHEAD, COMMON RORQUAL, GREYHOUND OF THE SEA, HERRING WHALE**
Population	**ATLANTIC**
SARA status	**SPECIAL CONCERN**



© Charly D.

Fin whales can measure 18 to 24 metres long and weigh between 40 and 50 tonnes. Fast swimmers capable of reaching top speeds of 40 km/h, fin whales are sometimes nicknamed “greyhounds of the sea.”

VULNERABILITY

The Atlantic fin whale population was greatly reduced by whaling, which was banned in 1972. Being exposed to heavy maritime, commercial and tourism-related traffic, this species is believed to be vulnerable to anthropogenic noise stemming from such activities due to the risk of collisions anddisturbance associated with the presence of ships.[39,40] The number of fin whales that frequent the St. Lawrence has been estimated at approximately 350 animals, despite a negative population growth index.[41] It is one of the main target species of whale-watching trips in the Saguenay-St. Lawrence Marine Park.[42] Boat avoidance strategies used by fin whales include interrupting their feeding activity, swimming faster or spending less time at the surface. The combined effects of these behavioural changes will likely compromise the reproductive success and survival of individuals.[40,42]

PHYSICAL DESCRIPTION

- The spout can reach heights of 4 to 6 metres, making it visible from several kilometres away.
- The back is dark grey, brown or black, with a lighter area behind the head known as a “chevron.” The right side of the jaw is white, as is the belly.
- The dorsal fin – clearly visible and often hook shaped – is located two-thirds of the way down the back. It appears a few seconds after the whale blows.
- The tail is wide and has pointy tips.

© J. Genesse, MMON

BEHAVIOUR

- Fin whales rarely show their tail when they dive.
- Though often seen alone or in small groups of three or more, fin whales have been observed in groups of up to 20 or so individuals when food is particularly abundant.

© R. Bergeron, MMON

DID YOU KNOW THAT...

the fin whale can live upwards of a century, with the oldest individual ever documented having reached the ripe old age of 140? This makes it one of the longest-living cetaceans in the world. But how can we determine the age of a fin whale? The answer lies in its ears, more precisely in the wax plugs that form in the ear canals. Wax plugs contain “growth layers” that, like the rings of a tree, can be counted under a microscope to determine the animal’s age.[38]

Young calf of Capitaine Crochet, a fin whale who died entangled in fishing gear in 2013. © S. Gagné

Baleen Whales

HUMPBACK WHALE

English name **HUMPBACK WHALE**

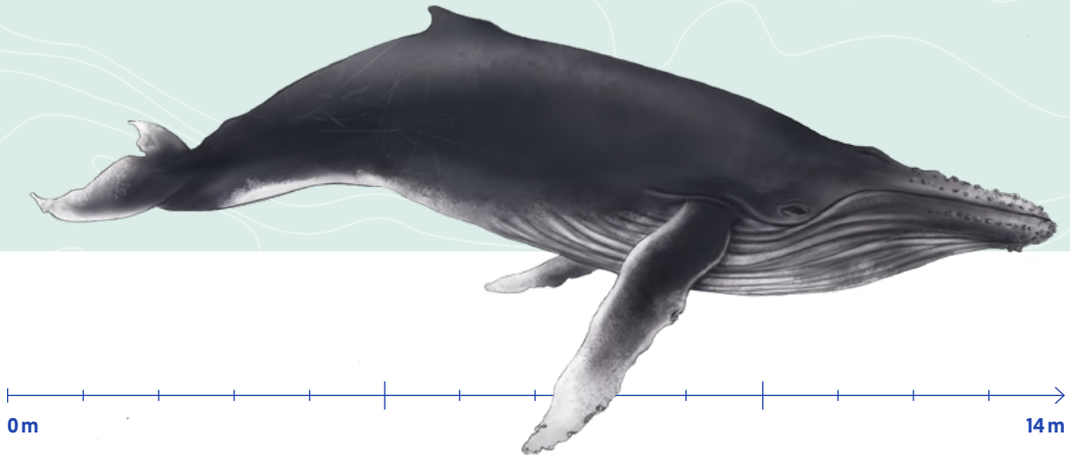
French name **RORQUAL À BOSSE**

Scientific name ***BALAENOPTERA MUSCULUS***

Other names **HUNCHBACKED WHALE, HUMP WHALE**

Population **WESTERN NORTH ATLANTIC**

COSEWIC status **NOT AT RISK**



© Charly D.

Humpbacks can measure 11 to 16 metres long and tip the scales at 30 to 40 tonnes. This species is known for its breaching and other acrobatics. It sometimes lifts its enormous white pectoral fins or its head out of the water, which adds to its charisma.

VULNERABILITY

The humpback whale population of the western North Atlantic has bounced back quite well since whaling was outlawed in 1963. Current threats faced by this population notably pertain to other human activities such as maritime traffic.[43] Humpback whales are vulnerable to disturbance caused by the presence of ships. In fact, some individuals have exhibited avoidance behaviour vis-à-vis watercraft, particularly those that approach to within less than 100 metres.[44] When boats are present, groups of mothers accompanied by their calves have also shown more behavioural changes than groups without calves, including longer dive times and less frequent surface activity.[44]

PHYSICAL DESCRIPTION

- The back is dark or black, while the belly shows black and white spots.
- The pectoral fins are very long and white in colour.
- On the head are small black bumps, each of which contains a single hair.
- The highly variably-shaped dorsal fin sits on a rounded hump, hence the name of the species.
- The tail is wide with serrated edges and pointy tips. The underside shows a wide variety of black-and-white colour patterns, which are often used to identify individuals.

BEHAVIOUR

- The tail is most often visible when the animal dives.
- Humpbacks can be observed alone or in variably-sized groups.
- This species is known for its impressive variety of surface behaviour such as breaching or slapping the water with its enormous pectoral fins or tail.

© R. Talbot, MMON

© I.-É. Foisy, MMON

DID YOU KNOW THAT...

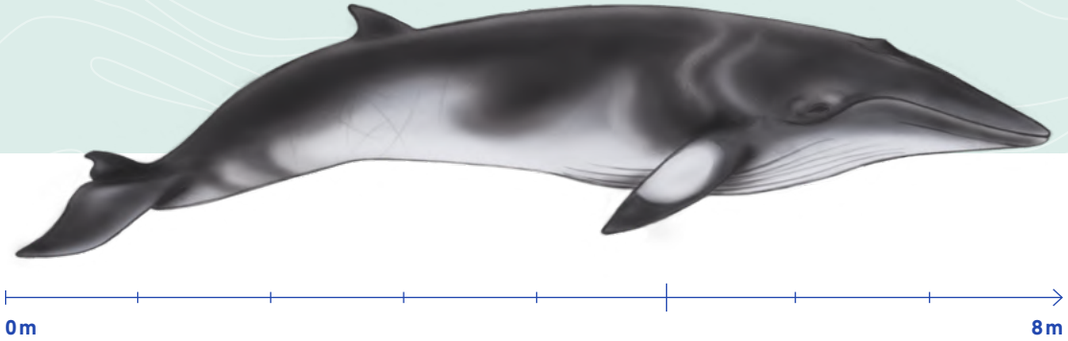
humpback whales have often been observed protecting other species from predator attacks (notably killer whales)? Researchers aiming to understand the motivation for this behaviour studied 115 cases of interactions between these two species. All in all, 89% of humpback whale interactions with killer whales were aimed at preventing the latter from preying on other species. The remaining 11% of these incidents were to protect the calves of their own species. The study was not able to rule out the possibility that this behaviour demonstrates that humpbacks are capable of altruism.[45]

© C. Horvath, MMON

Baleen Whales

MINKE WHALE

English name	**MINKE WHALE**
French name	**PETIT RORQUAL**
Scientific name	***BALAENOPTERA ACUTOROSTRATA***
Other names	**NORTHERN MINKE WHALE, COMMON MINKE WHALE, FINNER WHALE, LEAST RORQUAL, LESSER RORQUAL, LESSER FINBACK, LITTLE FINNER WHALE, PIKE WHALE, SHARP-HEADED WHALE, SHARP-HEADED FINNER**
Population	**NORTH ATLANTIC**
SARA status	**NOT AT RISK**



The minke whale is the smallest of all rorquals, measuring 6 to 10 metres long and weighing between 6 and 10 tonnes. It is known for its agility, speed and aerial acrobatics when feeding and does breach on occasion. This species is frequently observed during whale-watching trips due to its affinity for coastal habitats and the size of its population.

VULNERABILITY

Being frequently encountered by whale-watching vessels, the minke whale is vulnerable to disturbance, a phenomenon that has been observed in recent studies. When boats are present, the species alters its behaviour or interrupts its activities such as foraging or feeding.[46] It also exhibits less surface feeding behaviour. Instead, it makes erratic movements often associated with ship avoidance and interrupts its underwater foraging activities, which results in fewer feeding opportunities.[16] It has also been suggested that in the presence of whale-watching boats, minke whales will swim faster and increase their breathing rates, augmenting their energy expenditure by 27.6%.[47]

PHYSICAL DESCRIPTION

- Although the minke whale's spout is rarely visible, it can reach up to 2 metres high.
- Its tall, curved or hook-shaped dorsal fin is located two-thirds of the way down the back.
- The species has a black or dark grey back and a white belly. White spots are present on the pectoral fins.
- The tail is relatively small.

BEHAVIOUR

- Fin whales rarely show their tail when they dive.
- The minke whale is often observed alone
- and is capable of breaching.

DID YOU KNOW THAT...

there are two distinct species of minke whale, namely the northern minke whale (*B. acutorostrata*) and the Antarctic minke whale (B. bonaerensis)? As its name suggests, the latter's range is limited to the southern hemisphere. In addition to being quite different genetically, the two species also differ physically by the white patch on each pectoral fin of the northern minke whale, which its Antarctic cousin lacks. Additionally, the Antarctic minke whale measures 1 to 2 metres longer than the northern minke whale.[48,49]

Killer Whale © Steve B.

St. Lawrence beluga whale © GREMM

Toothed Whales

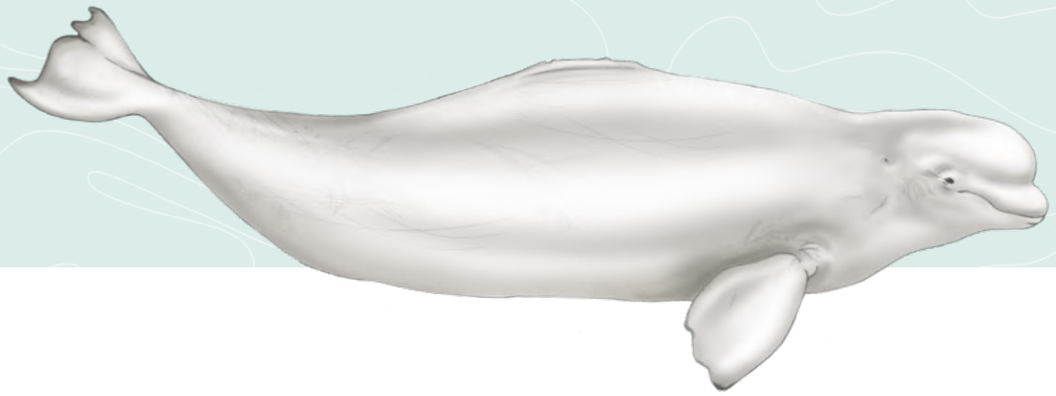
As their name implies, **toothed whales (also known as toothed cetaceans or odontocetes)** have sets of identical teeth that are used only to take hold of their food, which is then swallowed whole. Using a multitude of hunting techniques, they feed on a wide variety of prey such as fish, squid, crustaceans and even other marine mammals. They are often smaller in size than baleen whales, with the exception of the sperm whale. Toothed whales have a single blowhole at the top of their head and are often observed in groups that can be quite large.

Atlantic white-sided dolphin © H. Moors-Murphy

Toothed Whales

ST. LAWRENCE BELUGA WHALE

English name	**ST. LAWRENCE BELUGA WHALE**
French name	**BÉLUGA DU SAINT-LAURENT**
Scientific name	***DELPHINAPTERUS LEUCAS***
Other names	**BELUGA, WHITE WHALE, SEA CANARY, MELONHEAD**
Population	**ST. LAWRENCE ESTUARY**
SARA status	**ENDANGERED**



© Charly D.

0 m — 4 m

Easily recognizable by its white colour, the beluga can measure 3 to 4.5 metres long and weigh between 0.7 and 2 tonnes. The St. Lawrence beluga is the only cetacean considered to be a year-round resident in the St. Lawrence and is isolated from other populations of the species in the Arctic. This toothed cetacean is sometimes nicknamed the “sea canary” due to its varied vocal repertoire and its “chatty” character.

VULNERABILITY

The St. Lawrence beluga whale is struggling to recover from the intense hunting that plagued the population until it was banned in 1979. To this day, the population faces a multitude of threats, including disturbance and noise stemming from human activities.[50] Belugas show avoidance behaviours near boats, a phenomenon that is magnified when multiple craft are present.[51] Additionally, belugas alter their vocalizations as ships draw nearer, sometimes going so far as to stop emitting calls intended for other members of their species.[52]

PHYSICAL DESCRIPTION

- Although it can reach 2 metres high, the beluga’s spout is rarely visible.
- Adults are entirely white, while newborns are café au lait in colour and juveniles are bluish grey.
- Instead of a dorsal fin, the beluga has a small dorsal ridge.

BEHAVIOUR

- The tail is occasionally visible when the animal dives.
- The beluga is a gregarious species that lives in pairs, small groups or large herds.

© F. Gandolphe, MMON

© F. Gandolphe, MMON

DID YOU KNOW THAT...

Like the polar bear, arctic fox and snow goose, the beluga is an animal of the Arctic. Its snow-white colour allows it to blend into its northern environment. Similar to the narwhal, in lieu of a dorsal fin it has a dorsal ridge that can be used to break through thin sheets of ice when the animal surfaces to breath. The belugas of the St. Lawrence represent the southernmost population of the species; six other distinct populations can be found in the coastal waters of the Arctic Ocean.

© S. Giroux, MMON

Toothed Whales

SPERM WHALE

English name **SPERM WHALE**

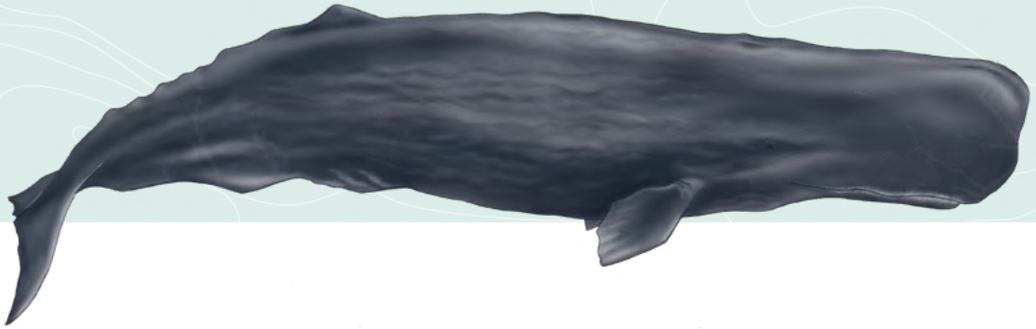
French name **CACHALOT MACROCÉPHALE**

Scientific name ***PHYSETER MACROCEPHALUS***

Other names **NONE**

Population **NORTH ATLANTIC**

COSEWIC status **NOT AT RISK**



© Charly D.

0 m — 15 m

Measuring 11 to 18 metres long and weighing up tot 50 tonnes, the sperm whale is the largest of toothed cetaceans. The species holds a number of diving records for both depth and duration, with dives that can last up to 90 minutes and reach depths of 2 to 3 kilometres.

VULNERABILITY

The North Atlantic population of sperm whales is still recovering from the impacts of commercial whaling. The global population has been designated “Vulnerable” and is on IUCN’s red list.[53] The species remains vulnerable to a number of threats, including the risk of collisions with ships and noise pollution caused by human activities.[54] It has been demonstrated that active sonar and noise generated by military activities trigger a reduction in the use of echolocation in this species. These results suggest a curtailment in their foraging activities, which can have severe consequences on their state of health.[55]

PHYSICAL DESCRIPTION

- The sperm whale produces a slanted spout relative to the water surface. It angles forward and to the left due to a single blowhole located on the left side of the animal’s head.
- The body is dark grey or brown, and the skin appears wrinkled and silvery.
- The massive, angular head represents over one-third of the total length of the body.
- The dorsal fin is small and triangular in shape, followed by a ridge that shows small bumps toward the rear of the back.
- The tail is large, broad, triangular and dark in colour.

© Groupe de recherche sur les cétacés

BEHAVIOUR

- The tail is nearly always visible when the animal dives.
- The sperm whale is most often observed alone or in small groups.
- It performs long breathing sequences of 30 or more inhalations between dives, creating the impression that it is floating on the surface for extended periods.
- It is known to breach on occasion.

© Groupe de recherche sur les cétacés

DID YOU KNOW THAT...

the sperm whale’s enormous head contains an equally impressive brain? Indeed, the sperm whale holds the title of the largest brain in the animal kingdom.[56] It weighs about 9 kilos, or about 5 times the mass of a human brain! However, this does not necessarily make the sperm whale the most intelligent animal. Cetaceans, especially toothed whales, have large, highly complex brains and impressive cognitive abilities. However, animal intelligence is very difficult to study and hence extremely challenging to quantify. Nevertheless, a large number of neuroanatomic and behavioural factors suggest that the sperm whale is highly intelligent.[57,58,59]

© Groupe de recherche sur les cétacés

Toothed Whales

HARBOUR PORPOISE

English name **HARBOUR PORPOISE**

French name **MARSOUIN COMMUN**

Scientific name ***PHOCOENA PHOCOENA***

Other names **PUFFING PIG**

Population **NORTHWEST ATLANTIC**

COSEWIC status **SPECIAL CONCERN**

© Charly D.

0 m — 1.5 m

The smallest cetacean inhabiting the North Atlantic, the harbour porpoise measures 1.3 to 2 metres long and weighs between 50 and 70 kilograms. Fast and elusive, it is very difficult to observe if waves are present.

VULNERABILITY

The harbour porpoise of the Northwest Atlantic is a coastal species that was often the victim of bycatch in fishing gear in the 1990s.[60] Numbering approximately 50,000 individuals, the population is still vulnerable to incidental catches, in addition to being prone to disturbance caused by maritime traffic including offshore whale-watching excursions.[61,62] In fact, a study conducted on several individuals in Danish waters has revealed that exposure to high noise levels from shipping and boating traffic discouraged the animals from using echolocation to detect their prey, potentially leading to lower food intake.[63] Harbour porpoises need to eat the equivalent of 10% of their body weight every day to stay healthy and can starve to death if they don't. Their small size also makes them more vulnerable to hypothermia.[64]

PHYSICAL DESCRIPTION

- Physical description
- The harbour porpoise's spout is very short and not visible.
- It has a black back and lighter-coloured flanks.
- The dorsal fin is triangular in shape and is located near the middle of the back.

BEHAVIOUR

- This species seldom shows its tail when it dives.
- The harbour porpoise is observed alone or in small groups. Compared to dolphins, it does not splash as much when it swims. It is much smaller than dolphins and appears only briefly when it surfaces to breath.

© C. Phillips

© M. Martel, MMON

DID YOU KNOW THAT...

the harbour porpoise can live around 20 years, which is the shortest life expectancy of any cetacean species in the St. Lawrence? Its top priority seems to be to reproduce quickly and intensely! In fact, with their fast-developing genital organs,[65] males reach sexual maturity by the age of 3 and females, by 4. Further, during the rut, the male's testicles represent 4 to 7% of its body weight, which in a human would be the equivalent of 3 kilos.[66] Females on the other hand are able to become pregnant even if they are lactating, which means they can give birth to a calf every year.[67]

Harbour porpoises with calf © MMON

Toothed Whales

NORTHERN BOTTLENOSE WHALE

English name **NORTHERN BOTTLENOSE WHALE**

French name **BALEINE À BEC COMMUNE**

Scientific name ***HYPEROODON AMPULLATUS***

Other names **BOTTLENOSE WHALE, BOTTLEHEAD**

Population **SCOTIAN SHELF**

SARA status **ENDANGERED**

© Charly D.

The northern bottlenose whale measures 7 to 10 metres long and weighs between 3 and 7 tonnes. The species regularly dives to depths of 800 to 1,000 metres, and even as far down as 2,300 metres. Its dives last between 30 and 40 minutes, with the record being 94 minutes.

VULNERABILITY

The Scotian Shelf population of northern bottlenose whales has been stable for the past thirty years or so.[68] Estimated in 2020 at fewer than 150 individuals,[69] this small population is exposed to risks stemming from human activities, including maritime traffic.[68,69,70] Indeed, the northern bottlenose whale is vulnerable to ship strikes as well as acoustic disturbance. These whales are particularly sensitive to sonar and underwater locator beacons that can cause them to avoid a given sector or to stop emitting clicks to echolocate their prey in deep water.[71,72] Other behavioural changes observed in this species relate to how they swim and dive. Disturbance from human activities results in lower food intake and increased energy expenditure.[71] In toothed whales, including the northern bottlenose whale, reduced food intake has a greater negative impact on an individual than the extra energy it spends to avoid a disturbance.[72]

PHYSICAL DESCRIPTION

- The spout is balloon-shaped and can reach 2 metres high; it may be visible in favourable weather conditions.
- The back is brownish grey to pale grey, with a slight cinnamon tint.
- The dorsal fin is small and curved.
- It has bulbous head and a dolphin-like beak, which occasionally pokes above the surface when the animal breaths.

BEHAVIOUR

- This species rarely shows its tail when it dives.
- It is generally observed in small groups.
- It is most often found far offshore in depths of over 1,000 metres, which explains why sightings of the species are rather rare.

© H. Moors Murphy

© H. Moors Murphy

DID YOU KNOW THAT...

in beaked whales, only males have visible teeth, while in females they rarely erupt from the gums? Like most of their cousins in the family Ziphiidae, males have a single pair of teeth in their lower jaw.[68,73] These teeth are not used for feeding but rather for fighting.

Jaw of a male Sowerby's beaked whale showing a pair of teeth © M. Milligan

Toothed Whales

LONG-FINNED PILOT WHALE

English name **LONG-FINNED PILOT WHALE**

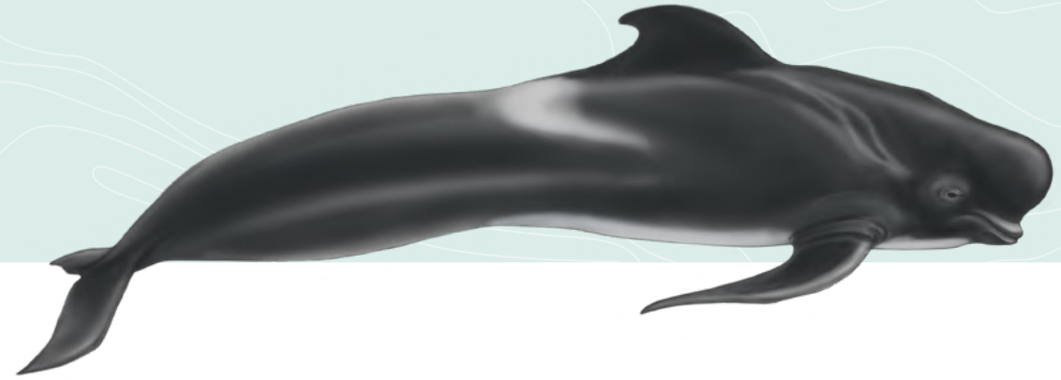
French name **GLOBICÉPHALE NOIR**

Scientific name ***GLOBICEPHALA MELAS***

Other names **CALDERON DOLPHIN, PILOT DOLPHIN, POTHEAD WHALE**

Population **NORTH ATLANTIC**

COSEWIC status **NOT AT RISK**



© Charly D.

0 m — 5 m

The long-finned pilot whale measures 4 to 6 metres long and weighs between 1.5 and 3 tonnes. This gregarious cetacean lives in large pods and is unfortunately known for its mass strandings. In the North Atlantic, the pilot whale is a summer resident in the southern Gulf of St. Lawrence, Cabot Strait and off the eastern coast of Newfoundland.

VULNERABILITY

The North Atlantic population of long-finned pilot whales is currently healthy, despite having been harvested historically and having suffered declines in Canadian waters. Two northern countries continue to hunt pilot whales, but limit their annual takes to around 500 individuals.[74] As a gregarious and highly acoustic species, the pilot whale is prone to disturbance from noise pollution generated by certain human activities such as seismic exploration, military sonar exercises and maritime traffic.[75] This disturbance translates into behavioural reactions in the species' diving and foraging patterns as well as avoidance, potentially leading to long-term impacts on its physical fitness and overall health.[76] Long-finned pilot whales that are exposed to underwater noise may considerably reduce their feeding time.[76,31] Collisions with ships have also been reported.[31]

PHYSICAL DESCRIPTION

- The spout is rarely visible.
- The back is completely black or dark brown, with a black or light grey saddle behind the prominent and distinctly back-sweeping dorsal fin.
- The head is globe-shaped and lacks a conspicuous beak.

BEHAVIOUR

- This species rarely shows its tail when it dives.
- It is capable of porpoising like dolphins,
- and regularly rests by remaining motionless at the surface.
- The long-finned pilot whale is often spotted in sizable groups numbering between 20 and 50 individuals.

© A. Penney

© A. Penney

DID YOU KNOW THAT...

data collected on board whale-watching boats in Nova Scotia have enabled a better understanding of the most important habitats used by this species? Crew members documented variations in the animals' use of habitat and were forced to make changes in the way they operated their vessels. Researchers observed a significant drop (31%) in the number of encounters with pilot whales between 2004 and 2016, and had to venture farther and farther offshore and cover twice as much ground to observe them, which meant they were forced to curtail the number of excursions they could make in a single day. Changes in the pilot whales' behaviour were also noted, with the animals spending less time feeding and more time socializing and resting. The authors of this study concluded that observation success would hardly be affected if they avoided two important foraging areas and that doing so would afford the species better feeding opportunities.[76]

Toothed Whales

KILLER WHALE

English name **KILLER WHALE**

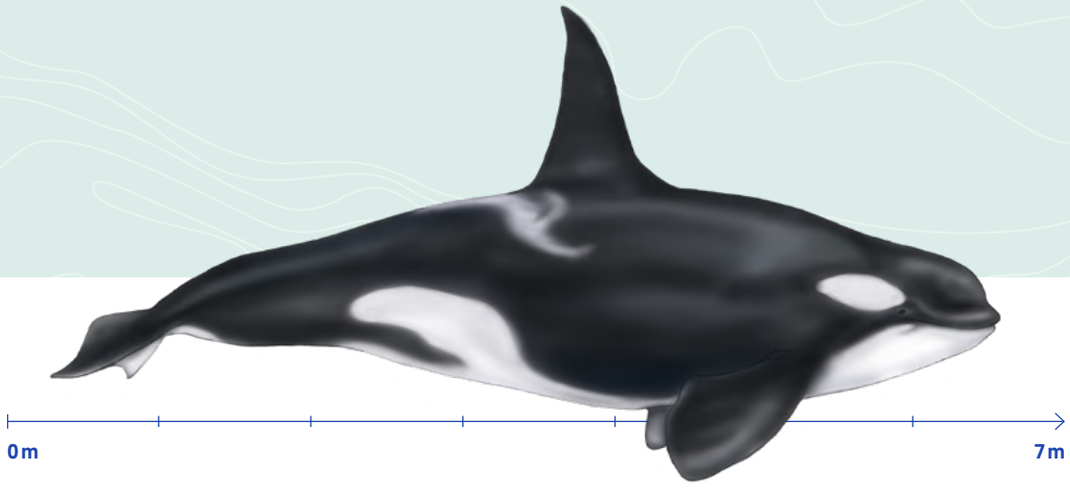
French name **ÉPAULARD**

Scientific name ***ORCINUS ORCA***

Other names **ORCA, GRAMPUS**

Population **NORTHWEST ATLANTIC AND EASTERN ARCTIC**

COSEWIC status **SPECIAL CONCERN**



© Charly D.

Measuring 6 to 9 metres long and weighing between 4 and 7 tonnes, the killer whale is the largest member of the dolphin family. A fast swimmer, it can clock speeds of up to 45 km/h when chasing its prey. Killer whales are especially observed in the coastal waters of Newfoundland and Labrador, especially in the Strait of Belle Isle. They are also regularly seen in the northeastern part of the Gulf of St. Lawrence.

VULNERABILITY

It is estimated that the Northwest Atlantic and Eastern Arctic killer whale population numbers fewer than 1,000 mature individuals (and quite likely even fewer than 250)[77] and is struggling to recover due to harvesting of the species in Greenland.[78] Killer whales are exposed to noise pollution disturbance in their environment, notably from the shipping and whale-watching industries. This disturbance results in a variety of behavioural reactions that can lead to group separation or less time or lower success foraging, potentially leading to energy deficits.[79,80] This represents a major source of concern for this species in regions with heavy maritime traffic or areas where such traffic volume is growing such as the Arctic.[77] Killer whales are also exposed to the risk of ship strikes, especially where fast-moving vessels pass in close proximity to the animals.

PHYSICAL DESCRIPTION

- The spout of a killer whale can spray up to 2 metres high but is inconspicuous.
- The back is black with a light grey pattern behind the dorsal fin.
- A white patch is present behind the eyes. The chin and belly are white.
- The pointy, triangular dorsal fin can reach 2 metres high in males and 1 metre in females.
- The underside of the tail is white.

BEHAVIOUR

- This species rarely lifts its tail when it dives.
- It sometimes leaps out of the water, showing its entire body.
- Killer whales are observed alone or in groups.

© J. Detcheverry

© J. Detcheverry

DID YOU KNOW THAT...

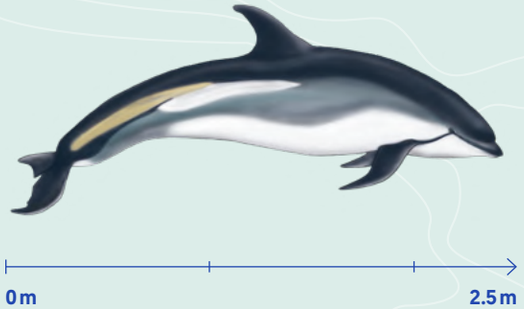
in cetaceans, gestation averages 10 to 12 months? In killer whales, however, it lasts between 15 and 18 months.[81] This is one of the longest pregnancies for any cetacean (together with the sperm whale and pilot whale for which gestation is around 16 months) and even one of the longest of any mammal in general.[82] Killer whale pods are led by menopausal female matriarchs that, with more time at their disposal than pregnant females, help in the rearing of the youngest pod members.

Female with calf © J-P Sylvestre, MMON

Toothed Whales

ATLANTIC WHITE-SIDED DOLPHIN

English name	**ATLANTIC WHITE-SIDED DOLPHIN**
French name	**DAUPHIN À FLANCS BLANCS**
Nom latin	***LAGENORHYNCHUS ACUTUS***
Other name	**WHITE-SIDED DOLPHIN, ATLANTIC WHITE-SIDED PORPOISE**
Population	**ATLANTIC**
COSEWIC status	**NOT AT RISK**



Several species of dolphins frequent the waters of the Northwest Atlantic. In the Gulf of St. Lawrence and along the Newfoundland and Labrador coasts, the Atlantic white-sided dolphin and white-beaked dolphin are the most frequently encountered species. Close cousins, these two species are similar both physically and behaviourally, but do show minor differences that can be used to tell them apart.

VULNERABILITY

Atlantic white-sided and white beaked dolphins are highly social and rely on sound to communicate with each other. For this reason, human activities that generate noise pollution, notably seismic surveys, oil and gas exploration as well as maritime traffic, are likely to cause disturbance to these dolphin species.[83,84] Moreover, a UK study on the effects of seismic surveys revealed that small toothed whales, including the two aforementioned dolphins, react to the noise emissions produced by airguns by avoiding the area.[85]

PHYSICAL DESCRIPTION

- The spouts of these two species are not visible.
- Both these dolphins feature a black back, a white belly,
- and a large hook-shaped dorsal fin.
- **Atlantic white-sided dolphin:** flanks featuring a white patch below the dorsal fin, above which is a yellow stripe extending toward the tail.
- **White-beaked dolphin:** white beak, black back with a white saddle behind the dorsal fin and light grey or white stripes on the flanks.

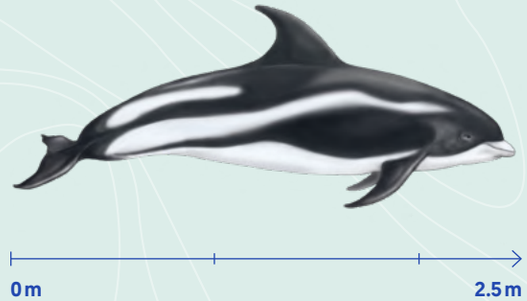
BEHAVIOUR

- Dolphins live in pods numbering anywhere from a handful to several hundred individuals.
- They regularly leap out of the water, showing their entire body.
- Fast swimmers, they splash when moving through the water.

Toothed Whales

WHITE-BEAKED DOLPHIN

English name	**WHITE-BEAKED DOLPHIN**
French name	**DAUPHIN À NEZ BLANC**
Nom latin	***LAGENORHYNCHUS ALBIROSTRIS***
Other name	**WHITE-NOSED DOLPHIN, SQUIDHOUND, WHITE-BEAKED PORPOISE**
Population	**ATLANTIC**
COSEWIC status	**NOT AT RISK**



Atlantic white-sided dolphin © S. Papias, MMON

White-beaked dolphin © M. Martel

DID YOU KNOW THAT...

altruistic behaviours have already been observed in white-beaked dolphins? In fact, these dolphins came to the aid of sick harbour porpoises by acting as an escort or placing themselves at their side to prevent them from injuring themselves.[86] Additionally, female white-sided dolphins have already been observed providing maternal care to young dolphins of other species.[87] This is known as epimeletic* behaviour. Many theories have been put forward to explain this phenomenon, notably attributing it to empathy or the dolphins' sociability.

**Epimeletic behaviour refers to any altruistic behaviour that involves a healthy individual caring for a dead or vulnerable animal.*

Toothed Whales

SHORT-BEAKED COMMON DOLPHIN

English name **SHORT-BEAKED COMMON DOLPHIN**

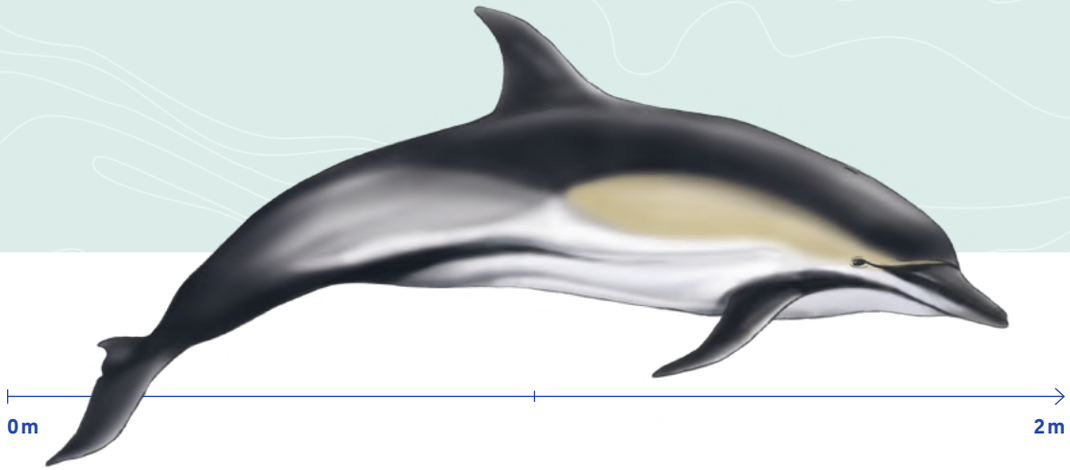
French name **SHORT-BEAKED COMMON DOLPHIN**

Scientific name ***DELPHINUS DELPHIS***

Other names **COMMON DOLPHIN**

Population **NORTHWEST ATLANTIC**

COSEWIC Status **NOT AT RISK**



© Charly D.

The short-beaked common dolphin measures 1.7 to 2.6 metres long and weighs between 75 and 115 kilograms. It is one of the most abundant and most familiar dolphins in the world. It is often found near underwater ridges and seamounts as well as continental shelves. This species is not rare on the Scotian Shelf off the coasts of the Maritime provinces.

VULNERABILITY

The short-beaked common dolphin is a highly sociable species that occasionally gathers in huge numbers.[88] In the waters of the Azores where these dolphins are routinely observed, the effects of whale-watching activities have been studied. In the presence of boats, this species may alter its activity or behaviour, especially as the latter relate to feeding or foraging.[89] Any ensuing reduction in food intake may result in energy deficits.

PHYSICAL DESCRIPTION

- The spout is not visible.
- The triangular dorsal fin is relatively tall and is located in the middle of the back.
- The latter varies in colour from bluish grey to black and the belly is white.
- Each flank is marked by large yellowish or tan spots in front (near the head) and light grey colouring in the rear (behind the dorsal fin). These two colour patterns meet in the middle to form an hourglass, which is diagnostic for the species.

© Fisheries and Oceans Canada

BEHAVIOUR

- Dolphins live in pods numbering anywhere from a handful to several hundred individuals.
- Like all dolphins, this species often leaps out of the water, displaying its entire body.
- The short-beaked common dolphin is a fast swimmer, reaching top speeds of up to 50 km/h.

© H. Moors-Murphy

DID YOU KNOW THAT...

short-beaked common dolphins are highly gregarious animals and are regularly spotted in “superpods” numbering several hundred individuals? These mass gatherings may occasionally team up to hunt or socialize and form even bigger congregations. These “super superpods” can sometimes exceed 10,000 individuals! This species is also known for its aerial acrobatics and can ride the waves created by the bows of ships.

© iNaturalist

Harbour seal © J. Linossier, MMON

Grey seal © S. Giroux, MMON

Seals

Seals are carnivores and are commonly known as pinnipeds, which means “webbed feet.” Seals differ from sea lions and walruses in that they lack external ear flaps. Only a small orifice can be seen behind the eyes. Their elongated rear flippers are positioned behind the body and are used for propulsion. When they swim, their front flippers are mainly used like a rudder. Because these flippers are so short, seals shuffle along quite awkwardly on dry land and ice. Places where seals congregate on dry land are called “haulouts,” which can be found on islands, rocky islets, tidal flats or ice floes. Some of these haulouts are used for activities critical to the animals’ survival such as pupping, nursing and moulting.

Harbour seal haulout in Forillon, Gaspésie © J. Linossier, MMON

Seals

HARBOUR SEAL

English name **HARBOUR SEAL**

French name **PHOQUE COMMUN**

Scientific name ***PHOCA VITULINA CONCOLOR***

Other names **COMMON SEAL, HAIR SEAL**

Population **ATLANTIC AND EASTERN ARCTIC**

COSEWIC Status **NOT AT RISK**

© Charly D.

0 m **1.5 m**

The harbour seal is a permanent resident of the St. Lawrence, meaning it inhabits our waters year-round and does not perform any seasonal migration like most other marine mammal species do. This small seal measures between 1.5 and 1.9 metres long and weighs between 60 and 150 kilos. As its name suggests, the species tends to favour nearshore waters where it can be spotted alone or in groups, notably at haulouts where it can gather in groups numbering in the hundreds.

VULNERABILITY

Though not necessarily a highly sought-after species by whale-watching tour operators, the harbour seal is affected by human activities.[90] A study conducted at a known haulout in Petit-Gaspé revealed disturbance behaviours upon the approach of watercraft, divers or hikers.[27] At other haulout sites in Bic National Park and in Métis,[91,92] changes in behaviour were also noted during peak tourism periods.[91] Disturbed individuals may return to the water or exhibit a persistent state of heightened alertness or a reluctance to haul out.

PHYSICAL DESCRIPTION

- The harbour seal has a small round head with a steep, well defined forehead and a slightly snub snout resembling that of a dog.
- The two nostrils of its small, heart-shaped nose form a V.
- Its coat varies from grey to brownish in colour and shows brown, black or yellow spots.

BEHAVIOUR

- Though rather solitary when in the water,
- this species can be observed in groups at haulout sites.
- When on land, it sometimes adopts what is known as the “banana” position.

© J. Linossier, MMON

© J. Linossier, MMON

DID YOU KNOW THAT...

in the majority of cases, harbour seal pups have an adult-like fur coat from the moment they are born? In other species, pups undergo several moults before they look like their parents. In harbour seals, a first moult occurs in the mother’s uterus before she gives birth. Therefore, as soon as it is born, the pup can leave the haulout site to accompany its mother into the water thanks to its adult coat.

© S. Giroux, MMON

Seals

GREY SEAL

English name **GREY SEAL**

French name **PHOQUE GRIS**

Scientific name ***HALICHOERUS GRYPUS***

Other names **ATLANTIC SEAL, HORSEHEAD SEAL**

Population **NORTHWEST ATLANTIC**

COSEWIC Status **NOT AT RISK**

© Charly D.

0 m — 2 m

The grey seal is a seasonal visitor to St. Lawrence waters between spring and fall. This large seals measures between 1.65 and 2.3 metres long and weighs between 200 and 350 kilos.

VULNERABILITY

The West Atlantic population of grey seals was heavily hunted in the 1960s. Population abundance soared from a few thousand individuals in the 1960s to approximately 366,400 animals in 2021, 15% of which is believed to be found in the Gulf of St. Lawrence. The 2021 survey marked the first time in 60 years that the estimated number of births declined on Sable Island off the coast of Nova Scotia.[94] These animals are exposed to a series of risks related to maritime traffic, notably accidental petrochemical spills that could contaminate haulout sites or the individuals themselves.[95]

PHYSICAL DESCRIPTION

- The species shows a large, elongated head with no distinct forehead and a broad, horse-like snout with two long, parallel nostrils.
- Males have a dark grey coat with light grey spots, while females are light grey with dark spots.

BEHAVIOUR

- Grey seals are solitary in the water but may be observed in groups at their haulout sites.
- In calm weather, their loud moans can be heard over 3 kilometres away, which explains why French speakers sometimes refer to them as “sea wolves.”

© A. Savoie, MMON

© S. Papias, MMON

DID YOU KNOW THAT...

remote sensing studies of grey seal movements are used by scientists at Fisheries and Oceans Canada to detect the presence of great white sharks? In fact, at a major haulout site for the species in Kouchibouguac National Park, a number of individuals have been tracked using temporary transmitters to detect their movements and establish correlations with the presence of sharks that prey on them.[96]

Swimming grey seals © P. Garet, MMON

Seals

HARP SEAL

English name **HARP SEAL**

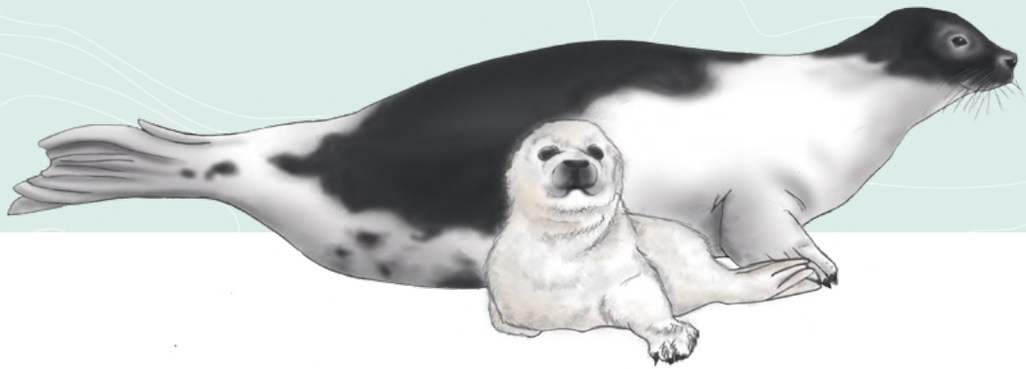
French name **PHOQUE DU GROENLAND**

Scientific name ***PAGOPHILUS GROENLANDICUS***

Other names **SADDLEBACK SEAL, GREENLAND SEAL**

Population **NORTHWEST ATLANTIC**

COSEWIC Status **NOT EVALUATED**



© Charly D.

0 m **1.6 m**

The harp seal is a winter visitor to the St. Lawrence that migrates southward from the Arctic for the breeding season. This mid-sized seals measures 1.6 metres long on average and weighs in the order of 140 kilos. It is strongly associated with the presence of ice, hence its scientific name, which translates as “ice lover.”

VULNERABILITY

Despite being commercially harvested in Canada, the Northwest Atlantic population of harp seals is very abundant. Prior to the year 2000, the population was estimated to comprise anywhere from 7.4 to 7.8 million individuals. According to the 2023 estimate, it now numbers between 6.7 and 6.9 million animals.[97] The lower estimates after the turn of the century are a reflection of higher and more variable juvenile mortality rates caused by a variety of factors including a reduction in ice cover.[97,98] In fact, on account of its ecology, which is closely tied to the presence of ice, the harp seal is vulnerable to climate change. Additionally, human activities related to maritime traffic can be a source of disturbance for these seals and increase the risk of ship strikes.[99]

PHYSICAL DESCRIPTION

- Its small roundish head features a snub nose and a pointy snout.
- It has a small, heart-shaped nose and V-shaped nostrils.
- Its light silver-grey coat features a diagnostic U-shaped pattern covering its back and flanks.

BEHAVIOUR

- Harp seals often swim on their backs.
- Highly gregarious, they form rambunctious groups that stir up the water surface, hence the species’ French nickname “brasseux,” which loosely translates as “agitators.”

© R. Trépanier, MMON

© C. Poirier Picker, MMON

DID YOU KNOW THAT...

the decline in ice cover observed over the past 10 years has the potential to threaten the occurrence of harp seals in the Gulf of St. Lawrence?[100] This phenomenon is closely tied to climate change.[97,98] This marine mammal requires ice cover to give birth to its pups. When ice is absent in the gulf, harp seals move upstream to rest on the ice that hugs the shorelines of the estuary.

Harp seals © J.-P. Sylvestre, MMON

Seals

HOODED SEAL

English name **HOODED SEAL**

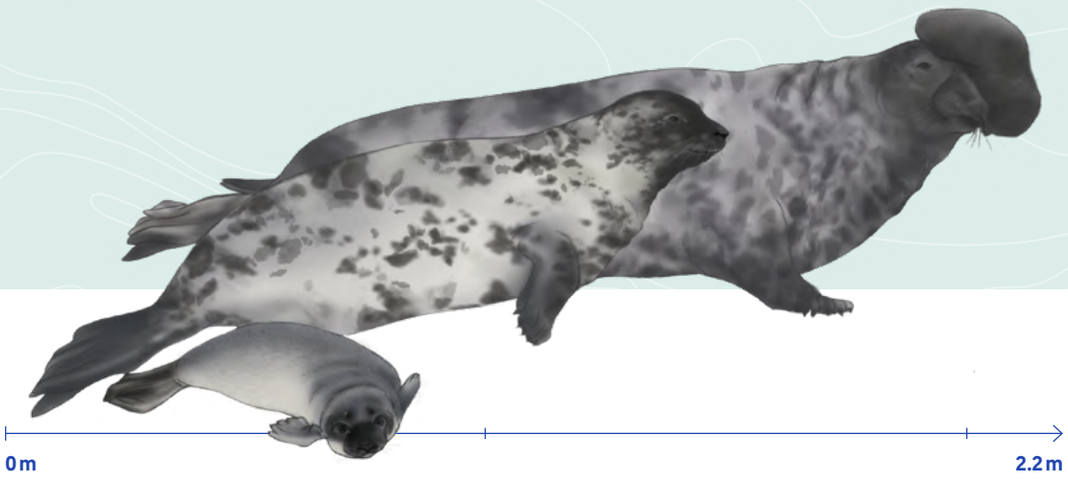
French name **PHOQUE À CAPUCHON**

Scientific name ***CYSTOPHORA CRISTATA***

Other names **BLADDER-NOSED SEAL, BLUEBACK (PUP)**

Population **NORTHWEST ATLANTIC**

COSEWIC Status **NOT AT RISK**



The hooded seal owes its name to the inflatable sac found on the snouts of adult males. Highly sexually dimorphic, this large seal measures between 2 and 2.6 metres long and weighs anywhere between 145 and 460 kilos.

VULNERABILITY

The Northwest Atlantic population of the species is estimated to number 593,500 individuals.[101] The hooded seal is a winter visitor to the Gulf of St. Lawrence. Like the harp seal, this species is vulnerable to climate change and human activities such as maritime traffic for the movement of goods, extraction of natural resources and tourism, all of which are expected to expand due to reduced ice cover, potentially leading to further increases in harmful emissions. Ship movement and noise can also be a source of disturbance for the species, not to mention the risk of collisions.[99]

PHYSICAL DESCRIPTION

- The species features a broad, squarish head and a short snout.
- Males have a sac atop their snout that forms a hood when inflated and hangs over the end of the nose otherwise.
- The male can inflate its nasal septum (membrane separating the two nostrils) and push out of one nostril what looks like a large red balloon.[102]
- Its bluish-grey coat is marked with irregular black splotches.
- The pup is light in colour with a silvery-grey back, hence its nickname “blueback.”

BEHAVIOUR

- The hooded seal is rather solitary in nature.
- To court their female counterparts, males inflate their appendage and vigorously shake it about while producing various sounds.

Female with pup © J.-P. Sylvestre, MMON

Male nasal septum © J.-P. Sylvestre, MMON

DID YOU KNOW THAT...

the hooded seal has the shortest lactation period of any mammal? On average, pups are nursed for four days during which they gain 7.1 kilos per day. As a result, they reach their weaning weight 3 to 10 times faster than other species of seals, notably thanks to the 61% fat content of their mother’s milk.[103]

Hooded seal pup © J.-P. Sylvestre, MMON

BIBLIOGRAPHY

1. Lettrich, M.D., M.J. Asaro, D.L. Borggaard, D.M. Dick, R.B. Griffis, J.A. Litz, A. Whitt et al., 2023. Vulnerability to climate change of United States marine mammal stocks in the western North Atlantic, Gulf of Mexico, and Caribbean. *PLOS ONE*, 18(9), e0290643.

2. Albouy, C., V. Delattre, G. Donati, T.L. Frölicher, S. Albouy-Boyer, M. Rufino, L. Pellissier, D. Mouillot and F. Leprieur, 2020. Global vulnerability of marine mammals to global warming. *Scientific Reports*, Volume 10, Article number: 548

3. COSEWIC, 2013. COSEWIC Assessment and Status Report on the North Atlantic Right Whale (*Eubalaena glacialis*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 58 p.

4. Beauchamp, J., H. Bouchard, P. de Margerie, N. Otis and J.Y. Savaria, 2009. Recovery Strategy for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic Population, in Canada. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, vi + 62 p.

5. Fisheries and Oceans Canada, 2020. Action Plan for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic Population, in Canada. Action plan series of the *Species at Risk Act*, Fisheries and Oceans Canada, Ottawa, iv + 23 p.

6. Fisheries and Oceans Canada, 2005. The Gulf of St. Lawrence: A Unique Ecosystem. The Stage for the Gulf of St. Lawrence Integrated Management (GOSLIM). Oceans and Science Branch. Cat. No. FS 104-2/2005. ISBN 0-662-69499-6.

7. Mosnier A., J.F. Gosselin and V. Lesage, 2022. Seasonal distribution and concentration of four baleen whale species in the St. Lawrence estuary based on 22 years of DFO observation data, DFO Can. Sci. Advis. Sec. Research document, 2020/053. iv + 119 p.

8. Arranz, P., N.A. de Soto, P.T. Madsen and K.R. Sprogis, 2021. Whale-watch vessel noise levels with applications to whale-watching guidelines and conservation. *Marine Policy*, 134, 104776.

9. Amrein, A. M. et al., 2020. Impacts of whale watching on the behavior of humpback whales (*Megaptera novaeangliae*) in the Coast of Panama. *Frontiers in Marine Science*: 1105.

10. Laist, D.W., A.R. Knowlton, J.G. Mead, A.S. Collet and M. Podesta, 2001. Collisions between ships and whales. *Marine Mammal Science* 17 (1):35-75.

11. Kelley, D.E., J.P. Vlasic and S.W. Brillant, 2021. Assessing the lethality of ship strikes on whales using simple biophysical models. *Marine Mammal Science*, 37(1), 251-267.

12. Shields, M.W., 2022. Commercial whale-watching reduces vessel incidents in the vicinity of killer whales in Washington State. *Marine Policy*, 145, 105290.

13. Transport Canada, 2019. Preventing marine environment pollution from ships. https://tc.canada.ca/en/marine-transportation/marine-safety/preventing-marine-environment-pollution-ships (viewed January 11, 2024).

14. International Maritime Organization, 2010. Information on North American Emissions Control Area (ECA) Under Marpol Annex VI, MEPC.1/Circ.723. London, UK: IMO Publishing. 9 p.

15. Rey-Baquero, M.P., L.V. Huertas-Amaya, K.D. Seger, N. Botero-Acosta, A. Luna-Acosta, C.E. Perazio et al., 2021. Understanding effects of whale-watching vessel noise on humpback whale song in the North Pacific coast of Colombia with propagation models of masking and acoustic data observations. *Frontiers in Marine Science*, 8, 623724.

16. Sprogis, K.R., S. Videsen and P.T. Madsen, 2020. Vessel noise levels drive behavioural responses of humpback whales with implications for whale-watching. *eLife*, 9, e56760.

17. Chion, C., J.-A. Landry, L. Parrott, D. Marceau et al., 2014. Insights from agent-based modelling to simulate whale-watching tours: Chapter 20 in: Higham, J., L. Bejder and R. Williams (eds). Whale-watching: Sustainable Tourism and Ecological Management. Cambridge University Press, 2014: 293-306.

18. Vanderlaan, A.S.M. and C.T. Taggart, 2006. Vessel Collisions with Whales: The Probability of Lethal Injury Based on Vessel Speed. *Marine Mammal Science*, 23(1):144–156.

19. Wright, A.J., Deak, T. and E.C.M. Parsons, 2011. Size matters: management of stress and chronic stress in beaked whales and other marine mammals may require larger exclusion zones. *Marine Pollution Bulletin* 2011;63(1-4):5-9.

20. Pace, R.M. and G. Silber, 2006. Simple analyses of ship and large whale collisions: Does speed kill? U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), poster, 1 p.

21. Simard, Y., C. Claing, C. Gervaise, N. Roy, L. Bourdages, F. Aulanier and M. Conversano, 2022. Estimation des niveaux de bruit de bateaux d'écotourisme opérant dans le parc marin du Saguenay-Saint-Laurent au moyen d'un observatoire acoustique. *Can. Tech. Rep. Fish. Aquat. Sci.* 3480: viii + 49 p.

22. Erbe, C., C. Reichmuth, K. Cunningham, K. Lucke and R. Dooling, 2016. Communication masking in marine mammals: A review and research strategy. *Marine Pollution Bulletin*, 103 (1-2), 15-38.

23. Lesage, V., A. Omrane, T. Doniol-Valcroze and A. Mosnier, 2017. Increased proximity of vessels reduces feeding opportunities of blue whales in the St. Lawrence Estuary, Canada. Endangered Species Research.

24. Machernis, A.F., J.R. Powell, L. Engleby and T.R. Spradlin, 2018. An updated literature review examining the impacts of tourism on marine mammals over the last fifteen years (2000-2015) to inform research and management programs.

25. Suárez-Rojas, C., M.M.G. Hernández and C.J. León, 2023. Sustainability in whale-watching: A literature review and future research directions based on regenerative tourism. Tourism Management Perspectives, 47, 101120.

26. Andersen, S. M., J. Teilmann, R. Dietz, N.M. Schmidt and L.A. Miller, 2012. Behavioural responses of harbour seals to human-induced disturbances. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 22(1), 113-121.

27. Couture, R., 2014. Évaluation des impacts de la fréquentation humaine sur la colonie de mise-bas de phoques communs du Saint-Laurent (*Phoca vitulina concolor*): étude de l'échouerie de Petit-Gaspé (Master's thesis, Université Laval).

28. Davies, K.T.A. and S. Brillant, 2019. Mass human-caused mortality spurs federal action to protect endangered North Atlantic right whales in Canada. *Marine Policy* 104: 157-162.

29. Stelle, L.L., 2017. Using citizen science to study the impact of vessel traffic on marine mammal populations. In J.A. Cigliano and H.L. Ballard (Eds.) Citizen Science for Coastal and Marine Conservation, Routledge Publisher.

30. Muzafar, R., 2022. Citizen Science: A Significant Contribution to Biodiversity Monitoring and Conservation. *Computational Biology and Bioinformatics*. Vol. 10, No. 2, 2022, p. 60-67. doi: 10.11648/j.cbb.20221002.12.

31. McComb-Turbitt, S., J. Costa, H. Whitehead and M. Auger-Méthé, 2021. Small-scale spatial distributions of long-finned pilot whales change over time, but foraging hot spots are consistent: Significance for marine wildlife tourism management. *Marine Mammal Science*, 37(4), 1196-1211.

32. Fisheries and Oceans Canada, 2021. Action Plan for the North Atlantic Right Whale (*Eubalaena glacialis*) in Canada. *Species at Risk Act* Action Plan Series. Fisheries and Oceans Canada, Ottawa. v + 46 p.

33. Meyer-Gutbrod, E.L., K.T. Davies, C.L. Johnson, S. Plourde, K.A. Sorochan, R.D. Kenney, C.H. Greene et al., 2022. Redefining North Atlantic right whale habitat-use patterns under climate change. *Limnology and Oceanography*.

34. MICS, 2019. Portrait d'une espèce en péril : La baleine franche de l'Atlantique Nord. https://www.rorqual.com/francais/actualites/portrait-d-une-espece-en-peril-la-baleine-franche-de-l-atlantique-nord.

35. Savoca, M.S., M.F. Czapanskiy, S.R. Kahane-Rapport, W.T. Gough, J.A. Fahlbusch, K.C. Bierlich, J.A. Goldbogen et al., 2021. Baleen whale prey consumption based on high-resolution foraging measurements. *Nature*, 599(7883), 85-90.

36. MICS, 2024. Our Whales / Blue Whale. https://www.rorqual.com/english/our-whales/blue-whale.

37. Guilpin, M., V. Lesage, I. McQuinn, P. Brosset, T. Doniol-Valcroze, T. Jeanniard-du-Dot and G. Winkler. Repeated Vessel Interactions and Climate- or Fishery-Driven Changes in Prey Density Limit Energy Acquisition by Foraging Blue Whales. (Switzerland). *Frontiers in Marine Science* 7: 1-16.

38. Fontaine, P.H., 2011. Baleines et phoques : biologie et écologie. Éditions Multimondes, Québec City, Canada. 452 p. ISBN: 9782895443018 (2895443017).

39. Fisheries and Oceans Canada, 2016. Management plan for the fin whale (*Balaenoptera physalus*), Atlantic population in Canada, *Species at Risk Act* Management Plan Series, DFO, Ottawa, vi + 38 p.

40. Jahoda, M., C.L. Lafortuna, N. Biassoni, C. Almirante, A. Azzellino, S. Panigada, G.N. Di Sciara et al., 2003. Mediterranean fin whale's (*Balaenoptera physalus*) response to small vessels and biopsy sampling assessed through passive tracking and timing of respiration. *Marine Mammal Science*, 19(1), 96-110.

41. Schleimer, A., C. Ramp, J. Delarue et al., 2019. Decline in abundance and apparent survival rates of fin whales (*Balaenoptera physalus*) in the northern Gulf of St. Lawrence. *Ecol. Evol.* 2019; 9: 4231-4244.

42. Martins, C.C., S. Turgeon, R. Michaud and N. Ménard, 2018. Suivi des espèces ciblées par les activités d'observation en mer dans le parc marin du Saguenay–Saint-Laurent de 1994 à 2017. *Le Naturaliste canadien*, 142(2), 65-79.

43. NOAA, 2023. Humpback Whale. https://www.fisheries.noaa.gov/species/humpback-whale.

44. Stamation, K.A., D.B. Croft, P.D. Shaughnessy, K.A. Waples and S.V. Briggs, 2010. Behavioral responses of humpback whales (*Megaptera novaeangliae*) to whale-watching vessels on the southeastern coast of Australia. *Marine Mammal Science*, 26(1), 98-122.

45. Pitman, R.L., V.B. Deecke, C.M. Gabriele, M. Srinivasan, N. Black, J. Denkinger, J.W. Durban, E.A. Mathews, D.R. Matkin, J.L. Neilson, A. Schulman-Janiger, D. Shearwater, P. Stap and R. Ternullo, 2017. Humpback whales interfering when mammal-eating killer whales attack other species: Mobbing behavior and interspecific altruism? *Mar. Mammal Sci.*, 33: 7-58.

46. Christiansen, F., M.H. Rasmussen and D. Lusseau, 2013. Whale watching disrupts feeding activities of minke whales on a feeding ground. *Marine Ecology Progress Series*, 478, 239-251.

47. Christiansen, F., M.H. Rasmussen and D. Lusseau, 2014. Inferring energy expenditure from respiration rates in minke whales to measure the effects of whale watching boat interactions. *Journal of Experimental Marine Biology and Ecology*, 459, 96-104.

48. Mériscope. Portrait of the Minke Whales. https://meriscope.com/research/minke-whale/.

49. Jefferson, T.A., M.A. Webber and R.L. Pitman, 2015. Marine mammals of the world a comprehensive guide to their identification. Academic Press/Elsevier. 608 p.

50. Fisheries and Oceans Canada, 2020. 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. Action plan series of the *Species at Risk Act*, Fisheries and Oceans Canada, Ottawa, iv + 31 p.

51. Blane, J.M. and R. Jaakson, 1994. The impact of ecotourism boats on the St Lawrence beluga whales. Environmental Conservation, 21(3), 267-269.

52. Lesage, V., C. Barrette, M. Kings ley and B. Sjare, 1999. The effect of vessel noise on the vocal behavior of belugas in the St. Lawrence River estuary, Canada. *Marine Mammal Science*, 15 (1): 65-84.

53. Taylor, B.L., R. Baird, J. Barlow, S.M. Dawson, J. Ford, J.G. Mead, G. Notarbartolo di Sciara, P. Wade and R.L. Pitman, 2019. *Physeter macrocephalus* (amended version of 2008 assessment). *The IUCN Red List of Threatened Species* 2019: e.T41755A160983555. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41755A160983555.en (viewed January 14, 2024).

54. NOAA, 2023. Sperm whale. https://www.fisheries.noaa.gov/species/sperm-whale.

55. Stanistreet, J.E. et al., 2022. Changes in the acoustic activity of beaked whales and sperm whales recorded during a naval training exercise off eastern Canada. *Scientific Reports*, 12(1), 1973.

56. Whitehead, H., 2018. Sperm whale Physeter macrocephalus. p. 919-925. In: Encyclopedia of Marine Mammals (B. Würsig, J.G.M. Thewissen and K.M. Kovacs, eds). Academic Press, London & San Diego. 1,157 p.

57. Whitehead, H., 2003. Sperm Whales: Social Evolution in the Ocean. University of Chicago Press, 431 p.

58. Marino, L., R.C. Connor, R.E. Fordyce, L.M. Herman, P.R. Hof, L. Lefebvre, H. Whitehead et al., 2007. Cetaceans have complex brains for complex cognition. PLOS Biology, 5(5), e139.

59. Dicke, U. and G. Roth, 2016. Neuronal factors determining high intelligence. Philosophical Transactions of the Royal Society B: Biological Sciences, 371(1685), 20150180.

60. Braulik, G., G. Minton, M. Amano and A. Bjørge, 2020. Phocoena phocoena. The IUCN Red List of Threatened Species 2020: e.T17027A50369903. https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T17027A50369903.en (viewed May 10, 2024).

61. COSEWIC, 2006. COSEWIC assessment and update status report on the harbour porpoise (*Phocoena phocoena*) (Northwest Atlantic population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 p. (www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/harbour-porpoise-northwest-atlantic.html).

62. North Atlantic Marine Mammal Commission, 2021. Harbour Porpoise https://nammco.no/harbour-porpoise/#1475845220355-579f0567-e59c (viewed May 10, 2023).

63. Wisniewska, D.M. et al., 2018. High rates of vessel noise disrupt foraging in wild harbour porpoises (*Phocoena phocoena*). Proceedings of the Royal Society B: *Biological Sciences*, 285(1872), 20172314.

64. Roberts, L., S. Collier, S. Law and A. Gaion, 2019. The impact of marine vessels on the presence and behaviour of harbour porpoise (*Phocoena phocoena*) in the waters off Berry Head, Brixham (South West England). *Ocean & Coastal Management*, Vol. 179, 104860.

65. Mclellan, W.A. et al., 2002. Ontogenetic allometry and body composition of harbour porpoises (Phocoena phocoena, L.) from the western North Atlantic. Journal of Zoology, 257(4), 457-471.

66. Sørensen, T.B. and C.C. Kinze, 1994. Reproduction and reproductive seasonality in Danish harbour porpoises, Phocoena phocoena. Ophelia, 39(3), 159-176.

67. Read, A.J., 1999. Harbour porpoise Phocoena phocoena (Linnaeus, 1758). Handbook of Marine Mammals: The Second Book of Dolphins and Porpoises, 6, 323-56.

68. COSEWIC, 2011. COSEWIC Assessment and Status Report on the Northern Bottlenose Whale (Hyperoodon ampullatus) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 31 p.

69. Fisheries and Oceans Canada, 2020. Assessment of the distribution, movements, and habitat use of northern bottlenose whales on the Scotian Shelf to support the identification of important habitat. DFO. Can. Sci. Advis. Sec., Sci. Advis. Rep. 2020/008.

70. Whitehead, H., R. Reeves, L. Feyrer and R.L. Brownell, Jr., 2021. *Hyperoodon ampullatus*. The IUCN Red List of Threatened Species 2021: e.T10707A50357742. https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T10707A50357742.en (viewed May 11, 2023).

71. Miller, P.J. et al., 2015. First indications that northern bottlenose whales are sensitive to behavioural disturbance from anthropogenic noise. Royal Society Open Science, 2(6), 140484.1.

72. Noren, D.P., M.M. Holt, R.C. Dunkin, N.M. Thometz and T.M. Williams, 2016. Comparative and cumulative energetic costs of odontocete responses to anthropogenic disturbance. In *Proceedings of Meetings on Acoustics* (Vol. 27, No. 1). AIP Publishing.

73. Fisheries and Oceans Canada, 2016. Recovery Strategy for the Northern Bottlenose Whale (*Hyperoodan ampullatus*), Scotian Shelf population, in Atlantic Canadian Waters. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada. viii + 70 p.

74. North Atlantic Marine Mammal Commission, 2016. Long-finned Pilot Whale. https://nammco.no/long-finned-pilot-whale/#hunting-and-utilisation.

75. Minton, G., R. Reeves and G. Braulik, 2018. *Globicephala melas*. The IUCN Red List of Threatened Species 2018: e.T9250A50356171. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T9250A50356171.en (viewed June 16, 2023).

76. Isojunno, S., D. Sadykova, S. DeRuiter, C. Curé, F. Visser, L. Thomas, P.J.O. Miller and C.M. Harris, 2017. Individual, ecological, and anthropogenic influences on activity budgets of long-finned pilot whales. *Ecosphere* 8(12):e02044. 10.1002/ecs2.2044.

77. COSEWIC, 2008. COSEWIC assessment and update status report on the Killer Whale *Orcinus orca*, Southern Resident population, Northern Resident population, West Coast Transient population, Offshore population and Northwest Atlantic / Eastern Arctic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 65 p.

78. North Atlantic Marine Mammal Commission, 2016. Killer Whale https://nammco.no/killer-whale/#1475845220355-579f0567-e59c.

79. Bain, D.E., A.W. Trites and R. Williams, 2002. A model linking energetic effects of whale watching to killer whale (*Orcinus orca*) population dynamics. Friday Harbor Laboratories, University of Washington, Friday Harbor, Washington.

80. Reeves, R., R.L. Pitman and J.K.B. Ford, 2017. *Orcinus orca. The IUCN Red List of Threatened Species* 2017: e.T15421A50368125. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T15421A50368125.en (viewed June 6, 2023).

81. Duffield, D.A., D.K. Odell, J.F. McBain and B. Andrews, 1995. Killer whale (*Orcinus orca*) reproduction at Sea World. *Zoo Biology*, 14(5), 417-430.

82. Center for Whale Research, 2023. Killer whale reproduction. https://www.whaleresearch.com/post/killer-whale-reproduction.

83. North Atlantic Marine Mammal Commission, 2016. White-beaked dolphin. https://nammco.no/white-beaked-dolphin/#1475845220355-579f0567-e59c.

84. North Atlantic Marine Mammal Commission, 2016. Atlantic white-sided dolphin. https://nammco.no/atlantic-white-sided-dolphin-2/#1475845220355-579f0567-e59c.

85. Stone, J. and L.M. Taske, 2006. The effect of seismic airguns on cetaceans in UK waters. *J. Cetacean Res. Manage.* 8: 255-263.

86. Kastelein, R.A., N. Jennings and L.A. Huijser, 2022. White-Beaked Dolphins (*Lagenorhynchus albirostris*) Cooperating with Humans and Showing Altruism Toward Harbor Porpoises (*Phocoena phocoena*). *Aquatic Mammals*, 48(1).

87. Pérez-Manrique, A. and A. Gomila, 2018. The comparative study of empathy: sympathetic concern and empathic perspective-taking in non-human animals. *Biological Reviews*, 93(1), 248-269.

88. NOAA, 2023. Short-Beaked Common Dolphin. https://www.fisheries.noaa.gov/species/short-beaked-common-dolphin.

89. Cecchetti, A., K.A. Stockin, J. Gordon and J.M.N. Azevedo, 2018. Short-term effects of tourism on the behaviour of common dolphins (*Delphinus delphis*) in the Azores. *Journal of the Marine Biological Association of the United Kingdom*. 2018;98(5):1187-1196. doi:10.1017/S0025315417000674

90. ROMM, 2004. Plan d'action sur le phoque commun (*Phoca vitulina concolor*) de l'estuaire du Saint-Laurent. Report produced for Fisheries and Oceans Canada and the Saguenay-St. Lawrence Marine Park in collaboration with the partners of the roundtable on the harbour seal of the St. Lawrence Estuary. Various pagings.

91. ROMM, 2021. Évaluation des impacts de la présence humaine sur la fréquentation des phoques communs au parc national du Bic. Rapport d'activité de la saison 2019. Marine Mammal Observation Network (MMON). 26 p.

92. Henry, E. and M. Hammill, 2001. Impact of small boats on the haulout activity of harbour seals (*Phoca vitulina*) in Métis Bay, Saint Lawrence Estuary, Québec, Canada, *Aquatic Mammals* 2001, 27.2, 140-148.

93. COSEWIC, 2007. COSEWIC Assessment and Update Status Report on the Harbour Seal, Atlantic and Eastern Arctic subspecies (*Phoca vitulina concolor*) and Lacs des Loups Marins subspecies (*Phoca vitulina mellona*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 p.

94. Fisheries and Oceans Canada, 2022. Stock assessment of northwest Atlantic grey seals (*Halichoerus grypus*) in Canada in 2021. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2022/018.

95. Bowen, D., 2016. *Halichoerus grypus*. The IUCN Red List of Threatened Species 2016: e.T9660A45226042. https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9660A45226042.en.

96. Radio-Canada, 2022. Traquer le phoque gris pour détecter la présence du requin blanc. https://ici.radio-canada.ca/nouvelle/1896474/phoque-requin-golfe-saint-laurent-parc-national-kouchibouguac.

97. Tinker, M.T., G.B. Stenson, A. Mosnier and M.O. Hammill, 2023. Estimating Abundance of Northwest Atlantic Harp Seal Using a Bayesian Modelling Approach. DFO Can. Sci. Advis. Sec. Research document, 2023/068. iv + 56 p.

98. Stenson, G.B., A.D. Buren and M. Koen-Alonso, 2016. The impact of changing climate and abundance on reproduction in an ice-dependent species, the Northwest Atlantic harp seal, *Pagophilus groenlandicus*, *ICES Journal of Marine Science*, Volume 73, Issue 2, January/February 2016, Pages 250–262.

99. North Atlantic Marine Mammal Commission, 2016. Harp Seal. https://nammco.no/harp-seal/#1475845220355-579f0567-e59c.

100. *Whales Online*, 2021. Does the limited amount of ice on the St. Lawrence affect the seal species that spend the winter there? https://baleinesendirect.org/en/does-the-limited-amount-of-ice-on-the-st-lawrence-affect-the-seal-species-that-spend-the-winter-there/.

101. Fisheries and Oceans Canada, 2019. Hooded Seal. https://www.dfo-mpo.gc.ca/species-especes/profiles-profils/hooded-seal-phoquecapuchon-eng.html.

102. Hannah, J., 2005. Seals of Atlantic Canada and the Northeastern United States. International Marine Mammal Association. Third edition. Québec City, Canada ISBN 0-9698171-3-4. 33 p.

103. Bowen, W.D., O.T. Oftedal and D.J. Boness, 1985. Birth to weaning in 4 days: remarkable growth in the hooded seal, *Cystophora cristata*. Canadian Journal of Zoology. 63(12): 2841-2846. https://doi.org/10.1139/z85-424.

ACKNOWLEDGEMENTS

This first edition of *A Whale-Watcher's Guide to Whales on the East Coast of Canada* was made possible by a number of partners and collaborators.

First and foremost, we would like to warmly thank the whale-watching companies that welcomed us aboard their vessels and took the time, despite their busy schedules, to speak to us about their offshore operations and experiences. The information collected during these exchanges provided invaluable guidance in the preparation of our work. For their time and expertise, we thank Jean Roy and Guy Synnott of Croisières Baie de Gaspé, Gérald Harvey and Cyril Praud of Croisière Escoumins, Nicolas Moreau and Catherine Moreau of Croisières Essipit, and Serge Cassivi and Olivier Cloutier of Cap Aventure.

The Navigating Whale Habitat projects, including this guide, are the culmination of the collaboration of our loyal partners. In this context, we would like to thank the following individuals for their dedication and the invaluable advice they provided throughout the preparation of this guide: Cristiane C. de Albuquerque Martins and Marie-Sophie Giroux of Parks Canada, Chloé Bonnette of Sépaq, Odélie Brouillette and Patrice Corbeil of the Group for Research and Education on Marine Mammals, Virginie Galindo, Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs du Québec as well as Virginie Christopherson, Natasha Dazé-Querry and Renée Gagné of Fisheries and Oceans Canada. We would also like to thank Nathaël Bergeron and Jérôme Gouron, as well as Catherine Bernier and Alain Guitard who authored the two prefaces on marine protected areas.

We further acknowledge all those who have given us permission to use their photos to illustrate this guide, including current and former MMON employees for the moments they captured during their field work, GREMM, photographer Renaud Pintiaux, Hilary Moors-Murphy, Joel Detcheverry, le Groupe de recherche sur les cétacés and Claude Nozères. For her whale and seal illustrations, we would also like to thank Charlène Dupasquier and praise her remarkable talent.

Lastly, this guide could not have been produced without the financial support of Fisheries and Oceans Canada's Habitat Stewardship Program (HSP) for Species at Risk.