

# Mariner's Guide

TO WHALES, DOLPHINS,  
AND PORPOISES OF  
WESTERN CANADA



COASTAL OCEAN  
RESEARCH INSTITUTE





## Credits

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# Prefaces

The island-studded coast of British Columbia features pristine water, dramatic shorelines, deep fjords, mist-shrouded mountains, and forests aplenty. Indigenous people have lived on this shoreline for millennia, feeding on a rich bounty of fish and shellfish and developing cultural traditions that continue to nourish them. The coast continues to support British Columbians in modern times — it serves as a highway for commerce, has some of the most productive fisheries in the world, and offers unparalleled recreational and ecotourism activities. It is no wonder, then, that British Columbians treasure their coast and are tireless in their efforts to conserve its natural values.

More than 20 species of marine mammals — from sea otters to mighty blue whales — call the B.C. coast home. Many of these species are listed as threatened or endangered, and active efforts are helping their populations recover. For some species, such as the humpback whale, these efforts are successful and recovery is well underway. For others recovery is slow, and for others still, such as the North Pacific right whale, population numbers remain perilously low.

One of the most significant human-caused threats whales face is injury or death from vessel collisions. One might expect the whales to hear the ships approach and take evasive actions to avoid them, and indeed this does occur sometimes. However, whales often have difficulty estimating the speed and bearing of ships and/or recognizing the risk they present, and collisions are tragically frequent.



One of the most significant human-caused threats whales face is injury or death from vessel collisions.

The purpose of this guide is to help mariners reduce their risk of striking and killing, or seriously injuring a cetacean (whale, dolphin or porpoise). It includes descriptions of frequently encountered whales and dolphins, locations along the coast where cetacean densities are highest, and simple measures they can take to greatly reduce their risk of striking a whale, dolphin or porpoise.

I have yet to meet a mariner who doesn't feel terrible if his or her ship hits a cetacean, and who, all things being equal, wouldn't avoid such an event if possible. So I know the motivation to reduce strikes is there — the key is knowing how to do it. To that end, I hope that bridge crew on vessels transiting through B.C. coastal waters will use the information in this guide to reduce the risk of hitting a whale on their watch. I also hope it will encourage mariners to record sightings of cetaceans (see page 16) and pass them on so researchers can improve sightings maps over time.

Finally, I'd like to thank those who helped in the preparation of this guide — notably Vancouver Aquarium marine mammal researchers Caitlin Birdsall, Bailey Eagan, and Tess Danelesko; the Ports of Prince Rupert and Vancouver for funding its production; and their environmental program managers Jason Scherr and Orla Robinson for their support, advice, and helpful reviews.



**Dr. Lance Barrett-Lennard,**  
Head Marine Mammal Scientist  
Coastal Ocean Research Institute  
Vancouver Aquarium Marine Science Centre



British Columbia's waters are full of natural beauty and wildlife. Not only do our waters sustain diverse populations of whales, porpoises and dolphins, but they also offer west coast mariners a place to work and play.

The safety of wildlife populations is essential to a healthy and fully functioning marine environment. A number of at-risk cetacean species frequent these west coast waters and are known to be vulnerable to both vessel collisions and noise disturbance.

With projected future growth in Canada's trade demands, as well as projected population growth on the west coast, movements of all types of vessels are anticipated to increase. Canadian port authorities are mandated under the *Canada Marine Act*, to facilitate Canada's trade objectives, ensuring goods are moved safely, while protecting the environment and considering local communities. These are some of the reasons why Vancouver Fraser Port Authority and the Port of Prince Rupert have partnered to create this Mariner's Guide.

This guide is intended to increase awareness about the potential impacts of vessel activities on cetaceans in this region, and highlight how mariners can help reduce these impacts. Collaborating with marine mammal experts from the Vancouver Aquarium and scientists from Fisheries and Oceans Canada, we hope this guide will be a valuable tool for all mariners; whether it be commercial vessel captains, coastal pilots, recreational boaters, fishers or whale watchers.

Thank you for reading. Enjoy these shared waters!



The safety of wildlife populations is essential to a healthy and fully functioning marine environment.



**Jason Scherr**

Manager, Environmental Sustainability  
Port of Prince Rupert



**Duncan Wilson**

Vice President, Corporate Social Responsibility  
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# Introduction

Marine transportation, or carriage of goods and people by water, has played a significant role in developing Canada's west coast over the centuries. Commercial vessel movements remain an essential part of life on the west coast today, serving both Canadian import and export markets, and British Columbia's many island and coastal communities and economies.

British Columbia's productive coastal ecosystem sustains numerous populations of cetaceans (whales, dolphins, porpoises) and sea turtles. It is also home to Canada's Pacific Gateway, moving people and goods within British Columbia and beyond, to more than 160 world economies.

Not only does reliable marine transportation support B.C.'s and Canada's economies, and move British Columbians safely and efficiently, it remains the most carbon-efficient mode of transportation. It produces fewer air emissions for each ton of goods transported per kilometre, compared to air or road transport. Nevertheless, because of the scale of marine transportation activities regionally and globally, the industry continuously seeks opportunities to improve sustainability and environmental performance and reduce potential environmental impacts.

To this end, the purpose of the *Mariner's Guide to Whales, Dolphins and Porpoises of Western Canada* is to promote a safer coexistence of vessels and cetaceans along the British Columbia coast. The information it provides will help vessel crew members identify key cetacean and sea turtle species, understand the potential threats their vessels pose to these species, and take action to minimize those threats.

Maps highlight areas where greater vigilance is required based on each species' known seasonal distribution and relative abundance.

Finally, the guide encourages mariners to share cetacean and sea turtle sighting information, which will help to conserve vulnerable species in B.C. waters by providing data that inform scientists and managers about their occurrence, distribution and relative abundance. This information is continually used for conservation-based research projects.

**In this guide, the term cetacean will be used to describe whales, dolphins and porpoises collectively. Although not a cetacean, later in the guide, we will also include information on leatherback sea turtles, a visitor to our coast also impacted by vessel traffic.**



# When Vessels Meet Cetaceans







There is an urgent need to protect British Columbia's vulnerable cetacean populations. Impacted by anthropogenic threats, 12 of the 27 populations or species of cetaceans (and sea turtles) found in B.C are listed as "At Risk" by Canada's Species at Risk Act (SARA). At-risk species in B.C. include:

- Endangered: blue, sei, North Pacific right, southern resident killer whale, leatherback sea turtle
- Threatened: fin whale, northern resident killer whale, offshore killer whale and Bigg's (transient) killer whale
- Special Concern: grey, humpback, harbour porpoise<sup>49</sup>

Potential vessel impacts on cetaceans include vessel strikes, disturbance, underwater noise and pollution. The importance of reducing these vessel-associated impacts is highlighted in the SARA Recovery Strategies and Management Plans for all 12 of these listed species<sup>10-17, 20</sup>. Actions detailed in this guide are essential to address and mitigate these threats and help conserve these populations.

The Species at Risk Act (SARA) is a piece of Canadian federal legislation. SARA was created to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk.

#### **SARA Definitions**

**Endangered:** Species facing imminent extirpation or extinction.

**Threatened:** Species which are likely to become endangered if nothing is done to reverse the factors leading to their extirpation or extinction.

**Special concern:** Species which may become threatened or endangered because of a combination of biological characteristics and identified threats.

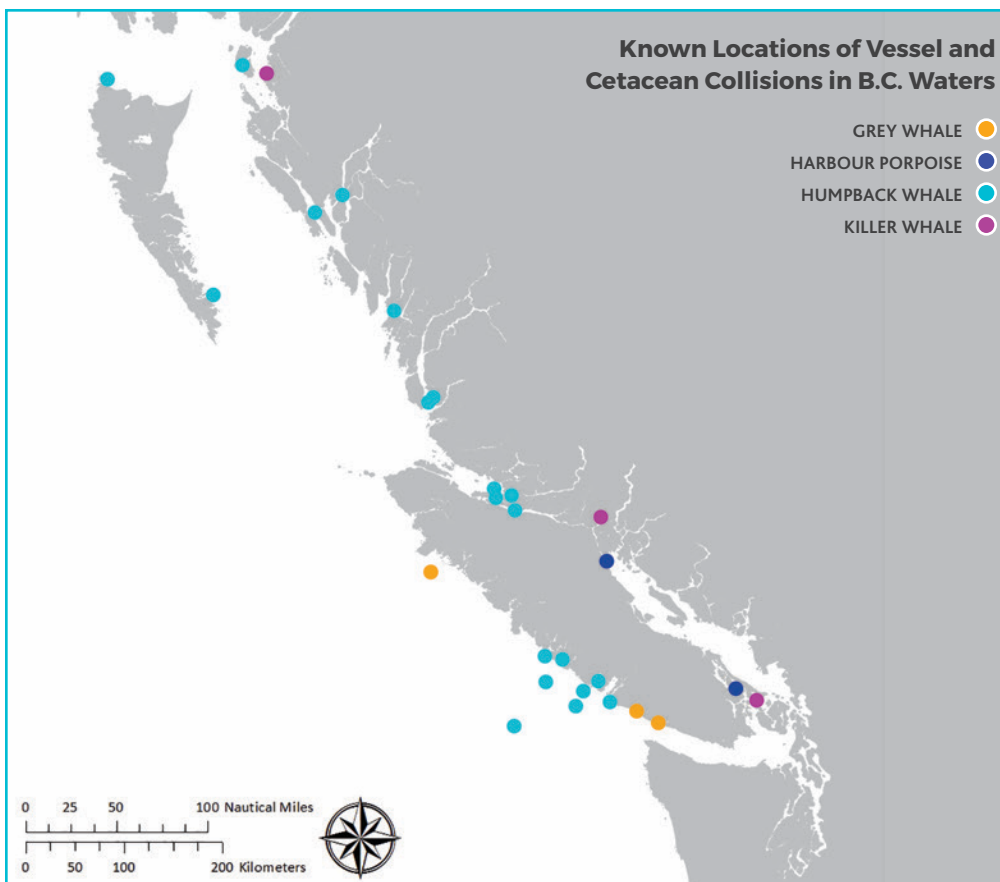
**Extirpated:** Species that no longer exist in the wild in Canada, but exist elsewhere in the wild<sup>49</sup>.

# VESSEL STRIKES

The waters of the eastern North Pacific are host to high densities of both cetaceans and marine traffic<sup>39,56</sup>. Cetaceans are vulnerable to being struck and injured or killed by vessels. Based on data collected from many of the world's oceans and examination of floating or beach-cast carcasses, vessel strikes are a recognized cause of mortality for a variety of cetaceans, many of which are found in B.C. waters<sup>26,29</sup>.

Thirty cetacean-vessel collisions categorized as "definite" or "probable" were reported to the B.C. Marine Mammal Response Network hotline and investigated by Fisheries and Oceans Canada from 2004-2011. These collisions involved killer whales, humpback whales, grey whales, fin whales and harbour porpoise<sup>48</sup>. The majority of these witnessed and reported strikes involved smaller vessel (less than 15m), however, this number likely underrepresents the frequency of vessel strikes and the involvement of larger vessels. Smaller vessels are more likely to detect, and therefore report, a strike because the impact is more easily felt and visibility of animals off the bow is superior<sup>27, 29</sup>. Many strikes undoubtedly go undetected, especially by large vessels or with small species, or unreported, resulting in an underestimation of this threat in B.C.

Maps featured on page 23 to 51 will give readers a sense of high density areas for various species of cetaceans found off the coast of B.C. and where encounters would most likely occur.



**In B.C., PLEASE REPORT any confirmed or suspected cetacean strike, or carcasses observed at sea, to the B.C. Marine Mammal Response Network at 1.800.465.4336.** This information is extremely valuable in improving the understanding of this issue and developing mitigation strategies to avoid strikes in the future. See page 23 for more details.

## FACTORS THAT INCREASE THE RISK OF COLLISION

Studies have shown that while all vessel types are implicated in vessel-cetacean collisions, those involving large and fast-moving vessels have a more severe impact and a higher chance of killing the cetacean<sup>29</sup>.

Vessels over 80 metres long, travelling faster than 14 knots, are the most likely to kill cetaceans in the event of a strike<sup>29</sup>. Studies have demonstrated that travel below 10 knots greatly decreases the likelihood of fatal vessel strikes, and that travel over 17.5 knots greatly increases that risk<sup>26,48</sup>.

### Mitigating Vessel Strikes

Reducing speed in areas where vessels and cetaceans overlap may decrease the probability of a strike<sup>42,47</sup>, as slower speeds increase the likelihood of detecting and avoiding cetaceans and allows more time for the animal to avoid the oncoming vessel. For example, speed restrictions in the eastern U.S. that require vessels greater than 65 metres in length to travel at speeds of 10 knots or less in areas frequented by endangered North Atlantic right whales have decreased strike-related mortality of this species by 80-90%<sup>4</sup>.

Decreasing vessel speed at night when visibility is low has also been proposed as a potential mitigation measure<sup>35</sup>.

Understanding the distribution of cetaceans helps identify and map high-risk areas for vessel strikes, and a large amount of these valuable data come from sightings reported by mariners on the water. You can help researchers learn more about high density whale-areas by reporting your sightings (see page 16 for information on how to do so).



# VESSEL DISTURBANCE

Cetacean populations are vulnerable to general disturbance by vessels. Large and small vessels may disturb and alter activities essential to cetacean survival, such as foraging (searching for food), surfacing, resting, predator avoidance, communicating, socializing, mating and nurturing calves<sup>32, 54</sup>. Interrupting these activities negatively affects individuals. In small populations (e.g. southern resident killer whales), these impacts on individuals can have population-level effects.

## Mitigating Vessel Disturbance

To reduce disturbance, vessels should keep a distance of at least 100 metres, although behavioural responses to vessels may be observed when vessels are 200-250 meters from cetaceans<sup>8, 37</sup>.

# VESSEL NOISE

In the North Pacific Ocean, underwater noise has doubled in intensity every decade for the past 60 years<sup>22</sup>. Motorized vessels contribute to underwater noise and may reduce the ability of cetaceans to detect prey, communicate, navigate, rest, avoid danger, mate and reproduce.

In high vessel traffic areas, whale communication and echolocation can be almost completely masked by noise<sup>9</sup>. Vessel noise can also increase a whale's stress level, and cause it to move away from or avoid entering an area<sup>8, 46</sup>.

## Mitigating Vessel Noise

Vessel noise can be decreased by operating below cavitation inception speed and avoiding rapid acceleration, as well as rerouting when in the immediate vicinity of cetaceans and known sensitive marine areas.

Additionally, the IMO guidelines<sup>25</sup> provide information on how to reduce vessel noise through maintaining clean hulls and propellers, insulating vessel engines and making use of resilient mountings for onboard machinery, as well as incorporating vessel quieting methods and materials during re-fits and new vessel construction.





## AIR POLLUTION FROM VESSELS

Marine engines burning diesel make sizeable contributions to emissions of sulphur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>2.5</sub>), and nitrogen oxides (NO<sub>x</sub>) in B.C.<sup>42b</sup>. Unlike terrestrial mammals, cetaceans do not have sinuses to filter the air they breathe or a sense of smell to help them detect and potentially avoid airborne pollutants such as exhaust gases (e.g. CO<sub>x</sub>, SO<sub>x</sub>, NO<sub>x</sub>). When whales do breathe in airborne pollutants, elevated lung pressure associated with diving causes pollutants to enter the blood more rapidly than in non-diving animals. Additionally, stable atmospheric inversion layers that commonly occur during the summer months trap air pollutants and concentrate them above the water's surface, exposing cetaceans to higher concentrations<sup>28</sup>.

### Mitigating Air Pollution

All vessel owners and operators can reduce their impact through the use of clean-burning fuels, and emission-reducing technologies. Adherence to emission limits and fuel specifications designated by the International Maritime Organization's MARPOL Annex VI and North American Emissions Control Area for ocean-going vessels are important steps to reducing air pollutant exposure <sup>25b</sup>.



# MINIMIZE LARGE VESSEL STRIKES AND DISTURBANCES

Acknowledging engineering and navigational limitations, and that safety is paramount, the following strategies are suggested to help reduce the impact of large vessels on cetacean populations. They should be employed when appropriate, feasible and safe to do so.

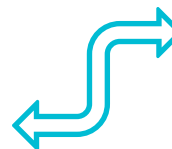
1.

**When cetaceans are observed or reported in your path, or in known high-density areas, consider reducing speed to 10 knots or less, if possible and safe.** The risk of striking cetaceans greatly increases with vessel speed.



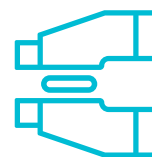
2.

**When possible, make gradual course changes away from the cetacean location or direction of travel.** If you sight a large aggregation of cetaceans that makes it impossible to avoid the group entirely, try to pass through the least dense part of the aggregation.



3.

**Maintain a sharp lookout for cetaceans in all coastal waters, paying particular attention when visibility is low.** If possible, post extra crew on the bow of the vessel to watch for cetaceans.



4.

Should groups of dolphins or porpoises choose to ride the bow wave of your vessel, **avoid sudden speed or course changes.**



5.

**Review the International Maritime Organization's guidelines<sup>25</sup> for vessel noise reduction** to find out how activities such as vessel maintenance, propeller design and selection, as well as selection and mounting of engines and machinery can lead to a quieter vessel.





A large white and black ship's hull dominates the right side of the frame. On the deck, a group of people is visible, looking out towards the water. The ship's hull is white on top and black on the bottom. In the foreground, several dolphins are leaping from the water, creating splashes. The water is shimmering with sunlight. In the background, a forested coastline is visible under a blue sky with scattered white clouds. Many seagulls are flying in the sky, some near the ship and others further away.

# Using Maps in this Guide

There are several types of maps included in this Guide, each visualizing a unique type of data related to either cetaceans or vessel traffic in B.C. waters.

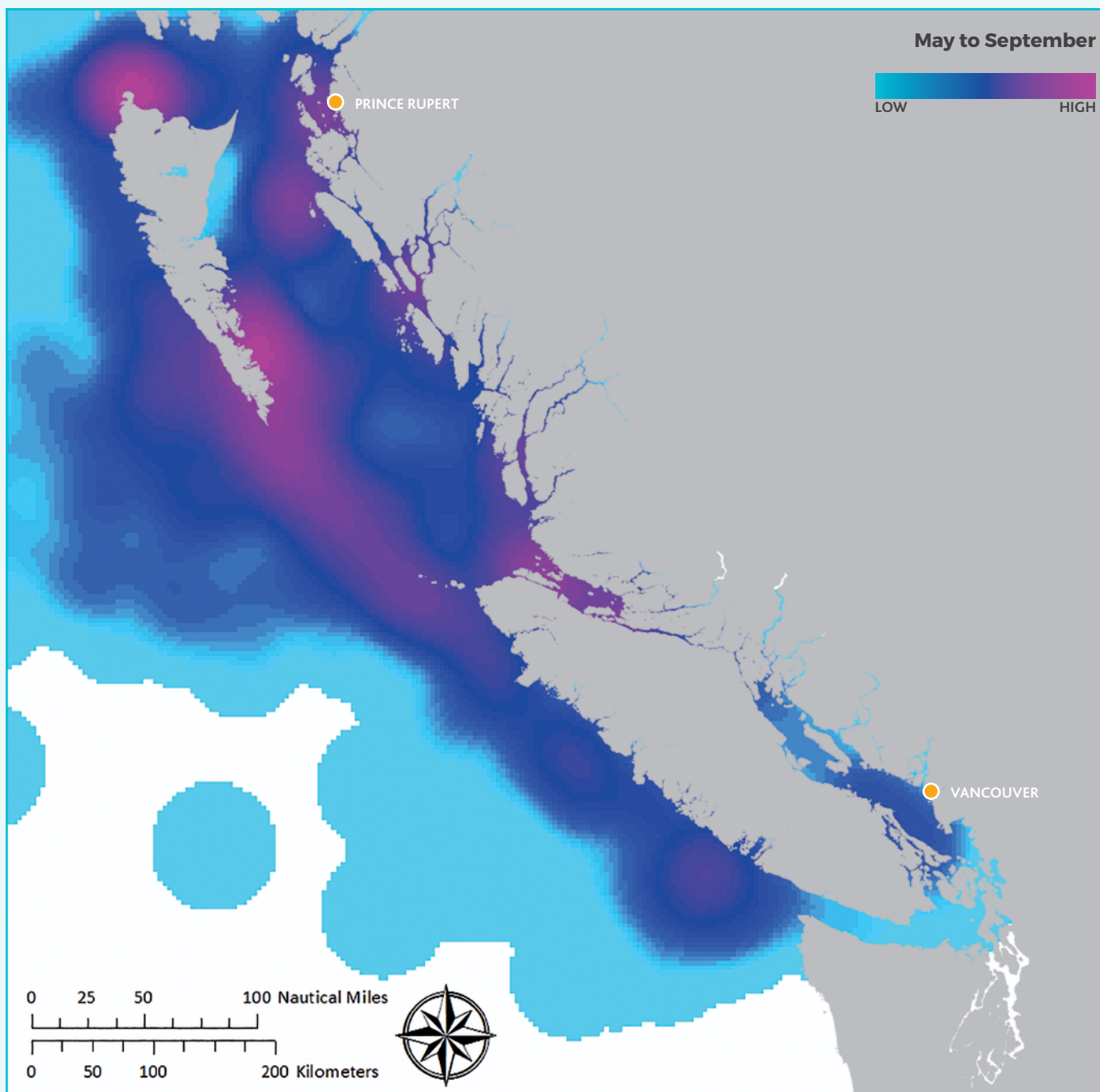
© PETER JUCKER



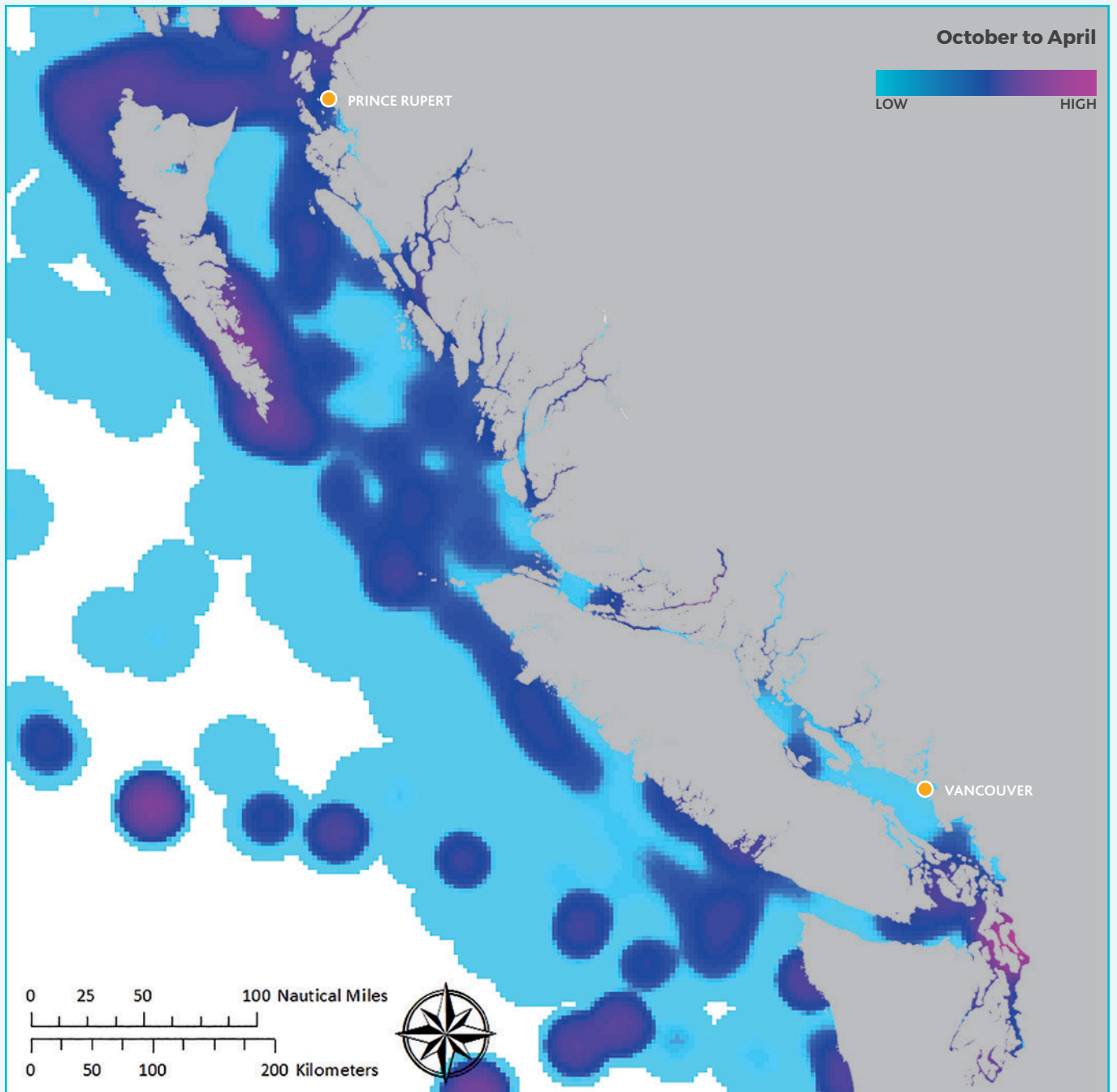
## Relative Abundance of Cetaceans in B.C. Waters

These maps highlight cetacean hotspots. Areas symbolized by the high end of the colour scale denote areas of high abundance, where the chance of a vessel encountering that particular species, or group of species, is highest. Both opportunistically collected data, which were corrected to account for the distribution of observer effort<sup>43</sup>, and systematic survey data were used in the creation of these maps. The goal of these maps is to make mariners aware of where they are most likely to encounter cetaceans in B.C. waters. It is important to note that cetaceans are wide-ranging and highly mobile, and while these figures

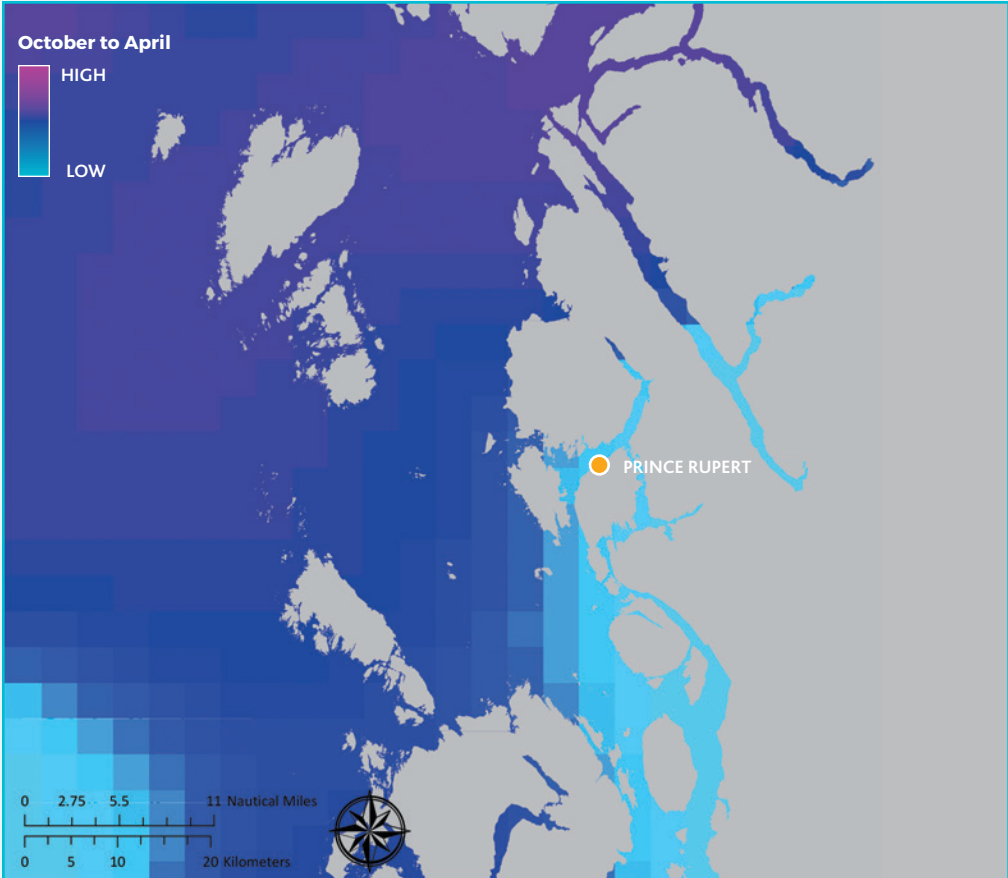
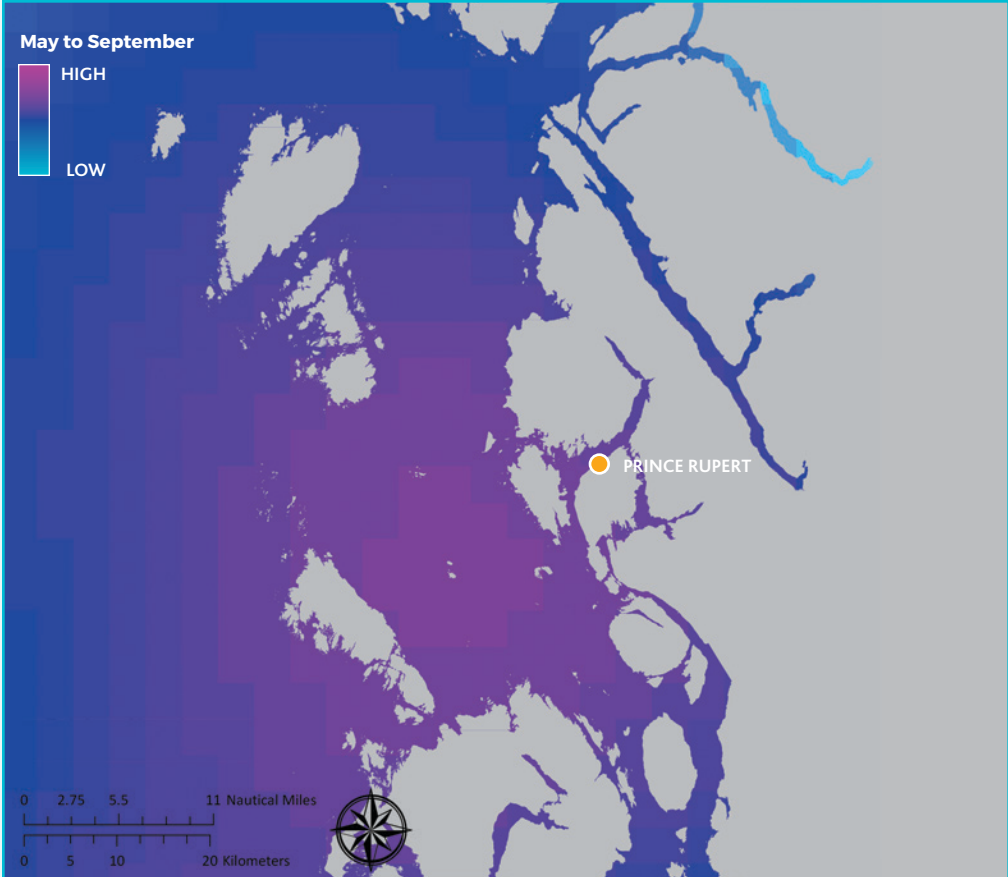
may serve as a guide to highlight areas of higher density, a cetacean encounter can occur anywhere in marine waters at any time. To ensure accurate estimates of relative abundance were displayed on each map, only data that was rated as high species identification confidence was used from the opportunistically collected dataset. Additionally, density values were smoothed to minimize potential anomalies resulting from very high or very low effort values and to prevent adjacent cells from having significantly different values.



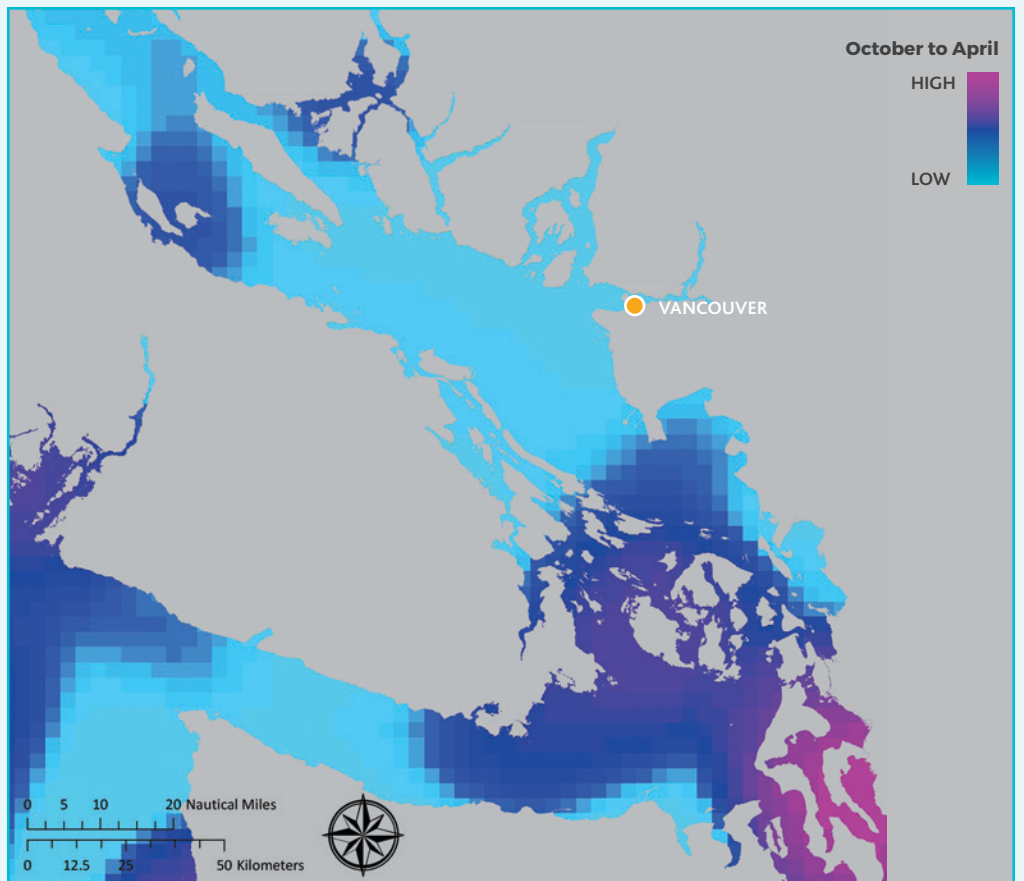
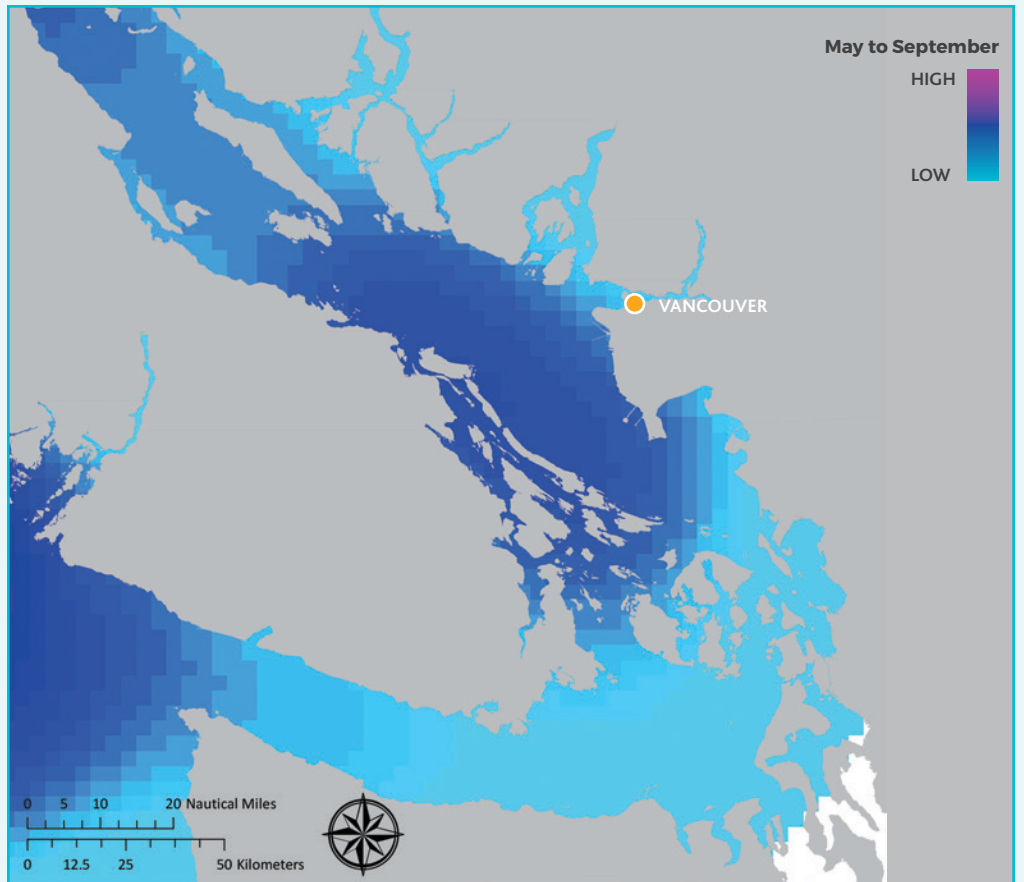




# Relative Abundance of Cetaceans Along the Approach to Prince Rupert



# Relative Abundance of Cetaceans Along the Approach to Port of Vancouver

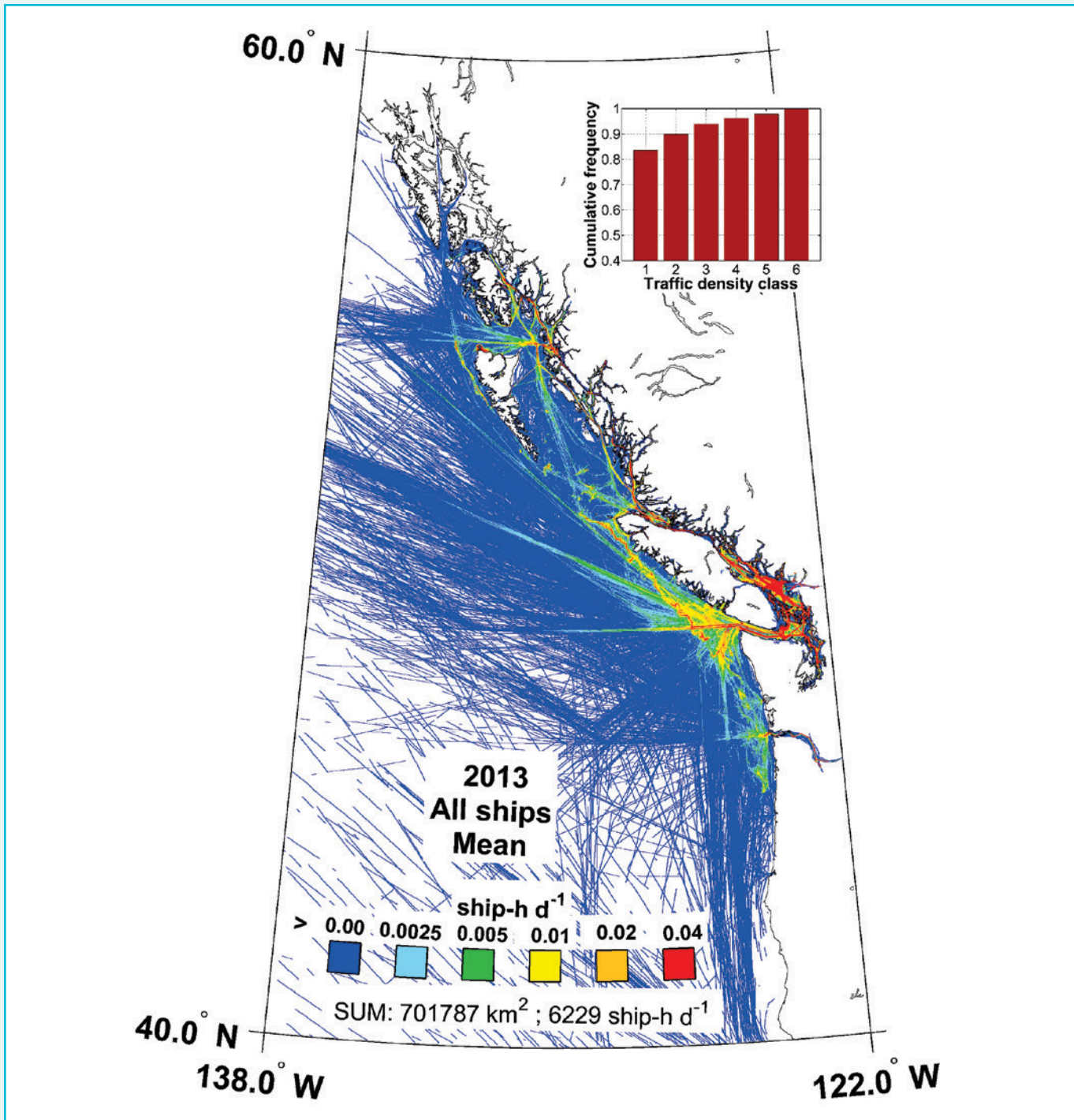


## AIS Vessel Traffic Density Off the West Coast of Canada for 2013

Traffic density in time and space is visualized in five distinct categories, with dark blue symbolizing zero to very low density, and red symbolizing high density.

This figure (below) may be helpful to reference when reviewing the maps of cetacean and sea turtle abundance as a means of identifying areas where vessels and cetaceans and sea turtles both occur in high density. The data displays all AIS mean traffic density in 2013.

Additionally, the number of squared kilometres containing traffic is provided below the palette as well as the sum of the daily traffic. The histogram shows traffic density per kilometre squared, with each bar corresponding sequentially to the traffic density intervals of the map palette (ie. > 0 to 0.0025 ship-h per 1km<sup>2</sup> grid cell is represented by traffic density class 1 and > 0.04 ship-h per 1km<sup>2</sup> is represented by traffic density class 6).



Simard, Y., Roy, N., Giard, S., and Yayla, M. 2014. Canadian year-round shipping traffic atlas for 2013: Volume 3, West Coast. Can. Tech. Rep. Fish. Aquat. Sci. 3091(Vol.3)E: xviii + 327 pp.





# Report Your Cetacean Sightings

Many populations of cetaceans are at risk in B.C. Report your sightings to help provide valuable information. By reporting your sightings, you are helping researchers better understand the distribution and abundance of these species.

## What to Report

**YOUR NAME AND CONTACT INFORMATION**

**SPECIES**

**DATE AND TIME**

**LOCATION**

Latitude/Longitude coordinates if available

**NUMBER OF ANIMALS**

**BEHAVIOUR OF ANIMALS**

**SEA STATE, WIND SPEED, AND VISIBILITY**



BREACH



FLUKE



PORPOISE



TRAVEL



TAIL/PECTORAL SLAP



BOWRIDE



SPYHOP



FEED

## Report your Sightings

**WILDWHALES.ORG**

**1.866.I.SAW.ONE (1.866.472.9663)**

**SIGHTINGS@VANAQUA.ORG**

**WHALEREPORT SMARTPHONE APP**

iOS and Android devices



# Whale-Vessel Strikes and Marine Mammals in Distress

Fisheries and Oceans Canada is responsible for assisting marine mammals and sea turtles in distress. If your vessel strikes a whale, or if you observe a sick, injured, distressed or entangled marine mammal in B.C. waters, please contact the B.C. Marine Mammal Response Network Incident Reporting Hotline immediately:

**1.800.465.4336 or VHF Channel 16**

## What to Report

**YOUR NAME AND CONTACT INFORMATION**

**SPECIES**

**DATE AND TIME**

**LOCATION**

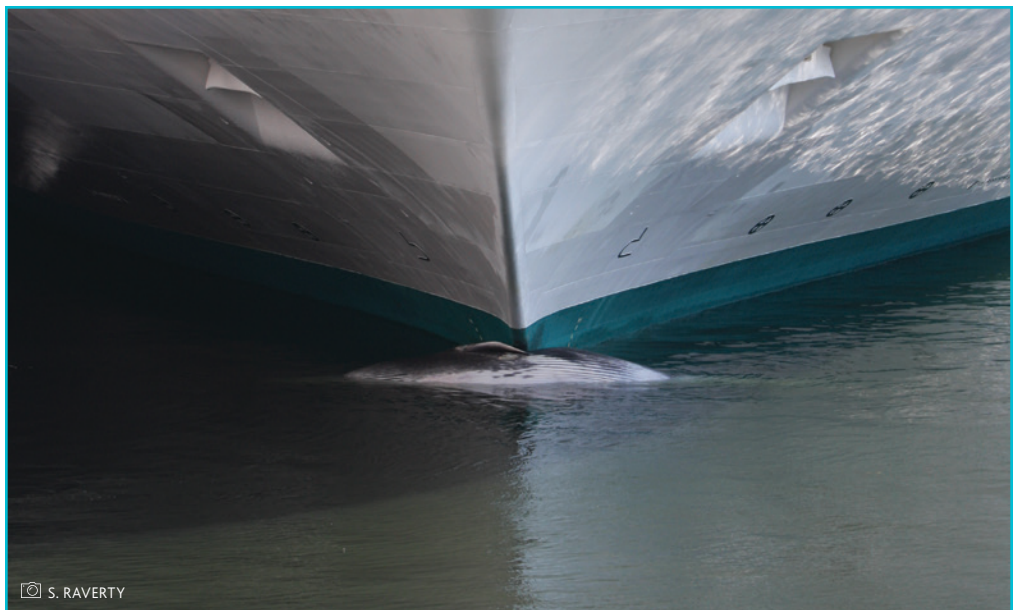
Latitude/Longitude coordinates if available

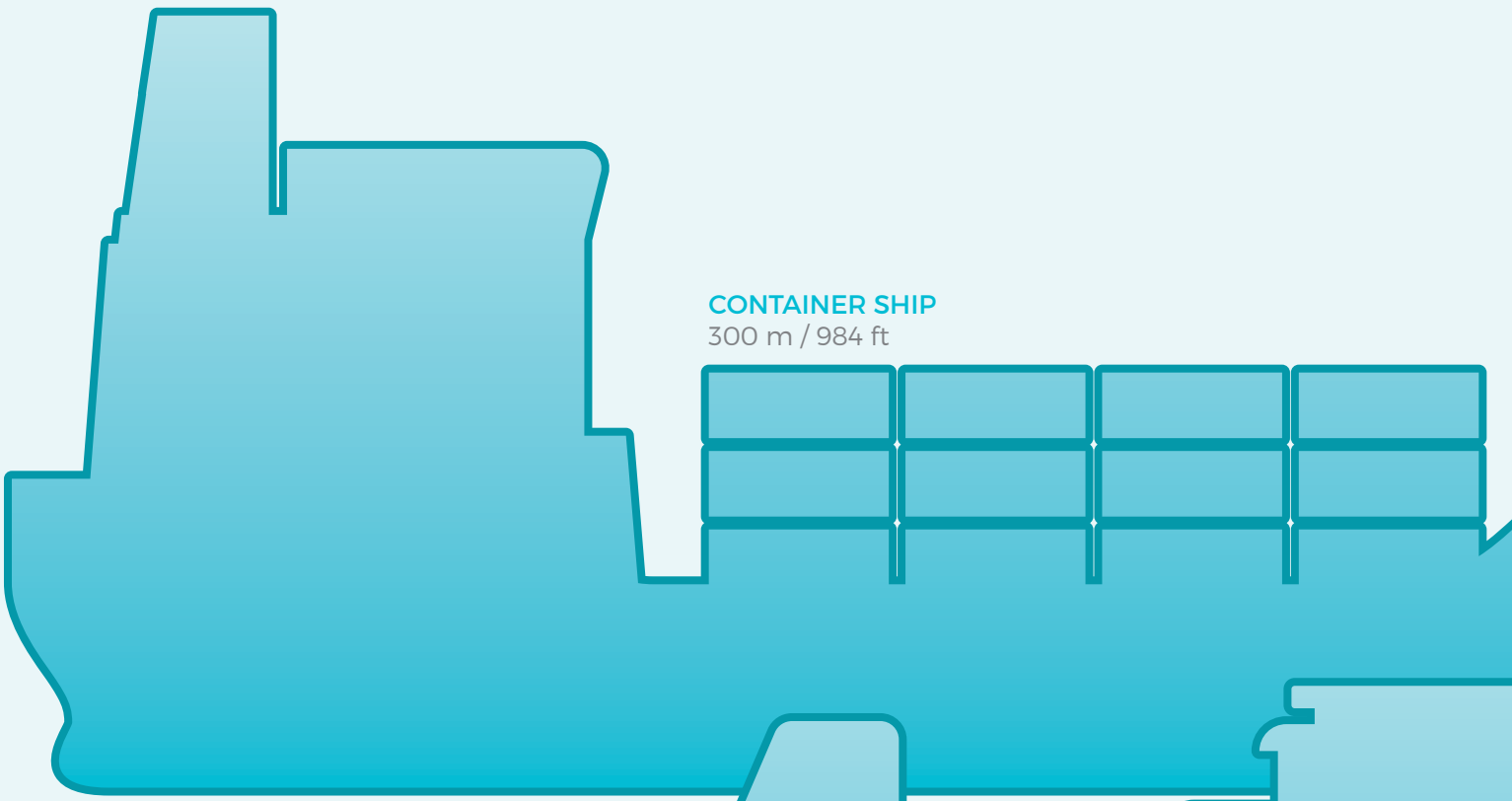
**ANIMAL ALIVE/DEAD**

**NATURE OF INJURY**

**PICTURES/VIDEO TAKEN**

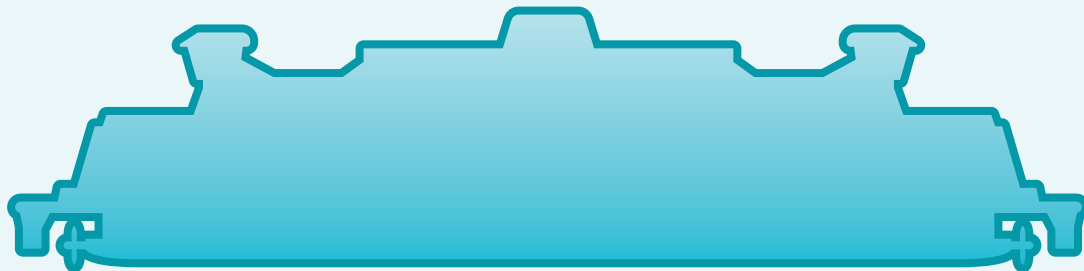
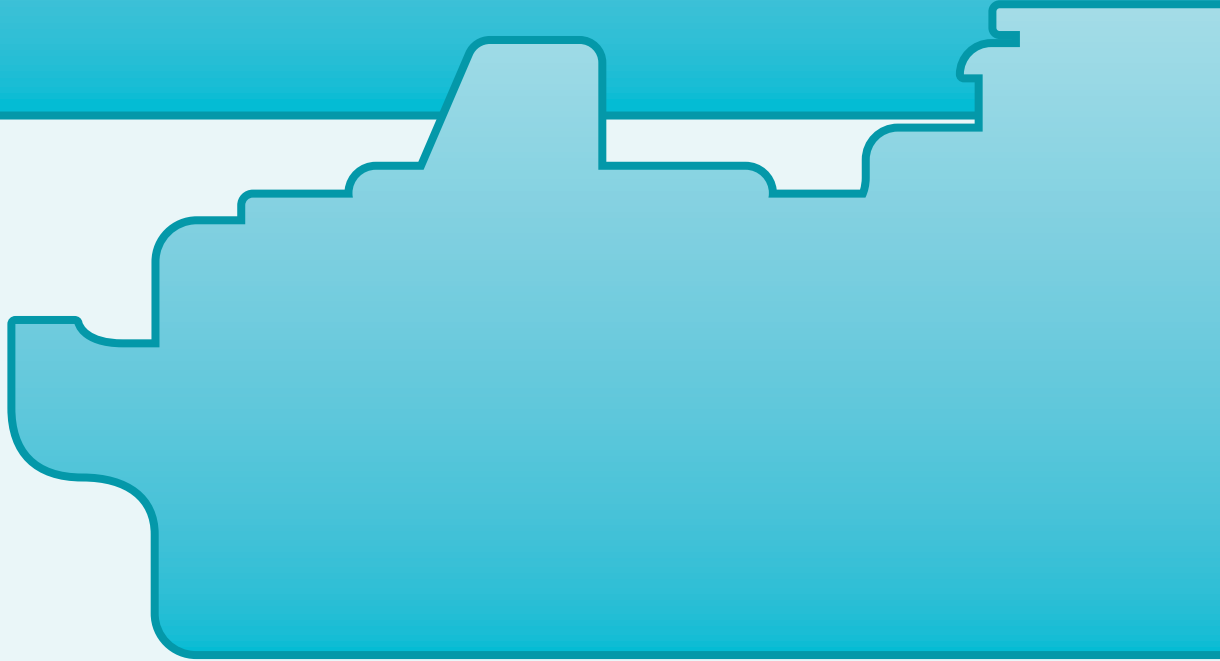
**DIRECTION OF ANIMAL'S TRAVEL**





**CONTAINER SHIP**

300 m / 984 ft



**C-CLASS FERRY**

160 m / 525 ft



**NORTH PACIFIC  
RIGHT WHALE**

17 m / 56 ft



**FIN WHALE**

18 m / 26 ft



**BLUE WHALE**

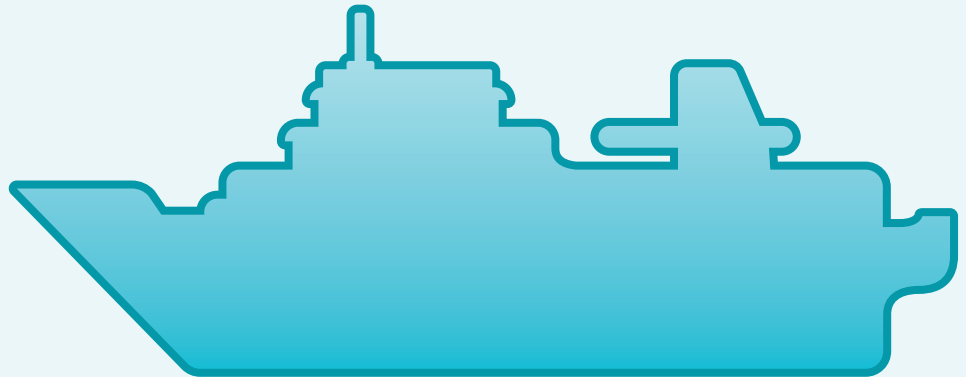
22 m / 72 ft



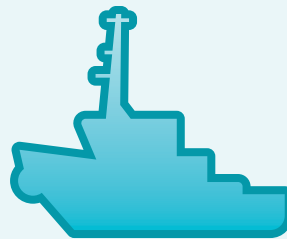
# How does your vessel compare to a whale?



**LARGE CRUISE SHIP**  
300 m / 984 ft



**POCKET CRUISE SHIP**  
140 m / 459 ft



**OCEAN TUG BOAT**  
40 m / 131 ft



**SPERM WHALE**  
13 m / 42 ft



**HUMPBACK WHALE**  
12 M / 39 ft



**GREY WHALE**  
12 m / 39 ft



**KILLER WHALE**  
8 m / 26 ft



**COMMON MINKE WHALE**  
8 m / 26 ft



**BULK CARRIER**  
200 m / 656 ft

# Cetaceans of British Columbia

Cetaceans (whales, dolphins and porpoises) are divided into the baleen whales (Mysticetes) and toothed whales (Odontocetes). Toothed whales, as the name implies, have teeth which vary in shape and size depending on the species. Toothed whales have highly developed biological sonar known as echolocation. They have only one blow hole opening on the top of their heads. Baleen whales do not have teeth. Instead, their mouths contain baleen which is made up of keratin-based, comb-like plates that filter the water for food. They have a blowhole with two openings on the top of their heads.

In the following section, average adult length measurements come from Ford 2014 and species statuses are displayed with the year of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessment or designation by the Species at Risk Act (SARA).

SARA was created to protect Canada's vulnerable wildlife species and uses COSEWIC as an independent organization tasked with recognizing and assessing at-risk species. COSEWIC assessments are considered the initial step in listing a species as SARA protected, and the federal government will use such assessments to determine if COSEWIC assessed species qualify for protection under SARA. In this guide we have listed COSEWIC statuses in cases where a particular species has been assessed by COSEWIC but not listed under SARA.

A large baleen whale is breaching the ocean surface, creating a massive splash of white water. The whale's dark, wet skin is glistening, and its baleen is visible, showing a pattern of yellowish-brown spots. The whale's body is partially submerged, with its back and head above the water. A large flock of seagulls is flying around the whale, some in the foreground and others in the background, all appearing to be in flight. The sky is a clear, bright blue, and the ocean is a deep blue. The overall scene is dynamic and captures a moment of intense activity in nature.

# Baleen Whales



# HUMPBACK WHALE

*Megaptera novaeangliae*



**Average Adult Length:** 12 m / 40 ft

## SARA Status 2013



### Dorsal Fin

Short with a broad base and variable in shape, located 2/3 of the way along the back of the body.

### Appearance

Grey to black on top, with varying amounts of white on underside, throat and pectoral fins. Thick body shape. Distinct pectoral fins, nearly 1/3 as long as body, colour can range from all black to all white, leading edges are scalloped. Distinctive knobs present on top of head. Underside of tail can range from all black to mostly white. Bushy-shaped blow.

### Behaviour

Usually lifts tail flukes when making a deep dive. Can be active and acrobatic at surface.

### Distribution

Found in all the world's oceans. North Pacific population is highly migratory and can be found in coastal shelf waters of northern Japan, Russia, Alaska, B.C. and the west coast of the United States during summer months. Breeding grounds are near islands or reefs in Hawaii, Mexico, Central America and Asia during winter months.

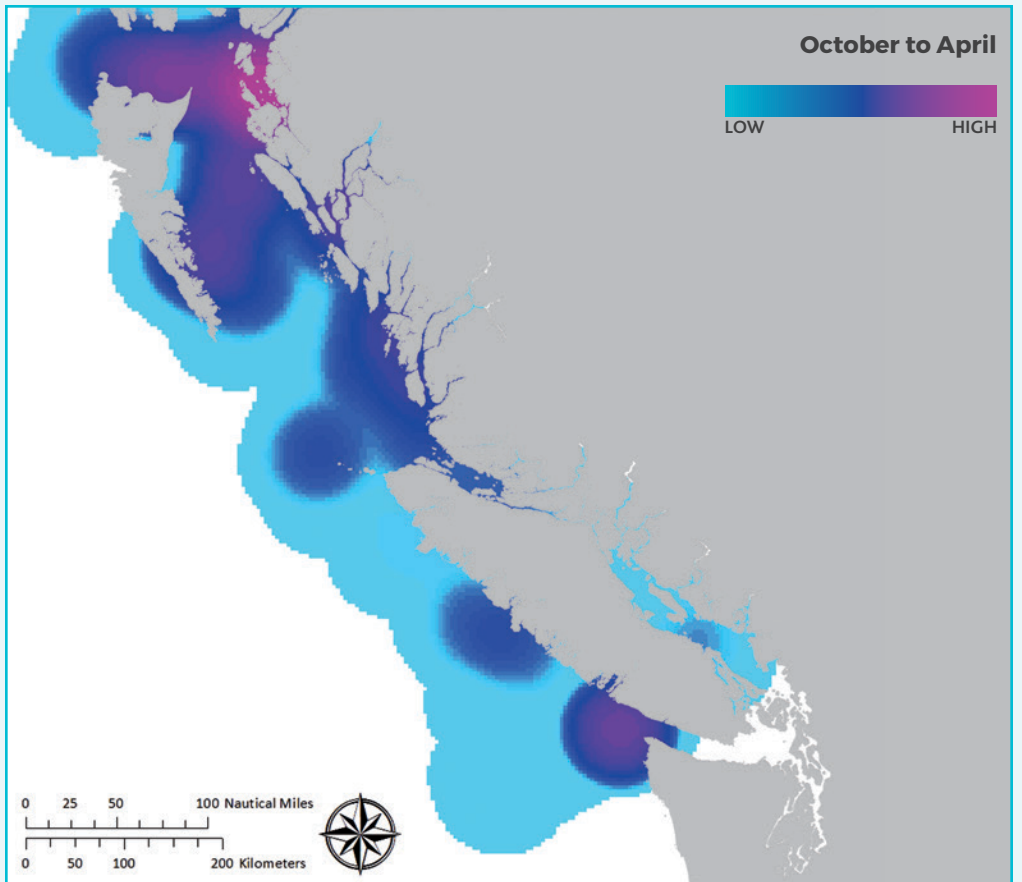
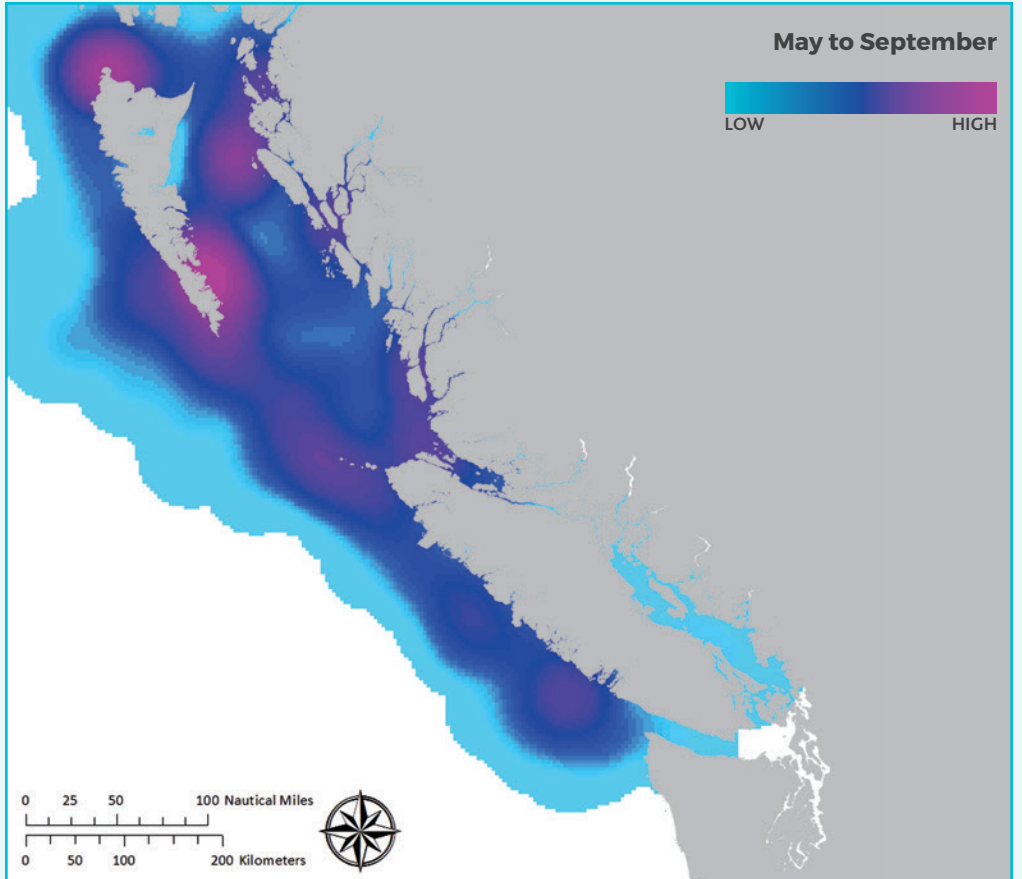
### Vulnerability of the Species

Humpback whales experience the second highest strike rate of any whale species worldwide because they are relatively abundant and they often feed at or near the surface<sup>29</sup>. Additionally, vessel noise may disturb humpback whales and cause them to move away from the best feeding areas<sup>16</sup>.

Further threats to humpback whales include entanglement, toxic spills and prey reduction<sup>16</sup>.

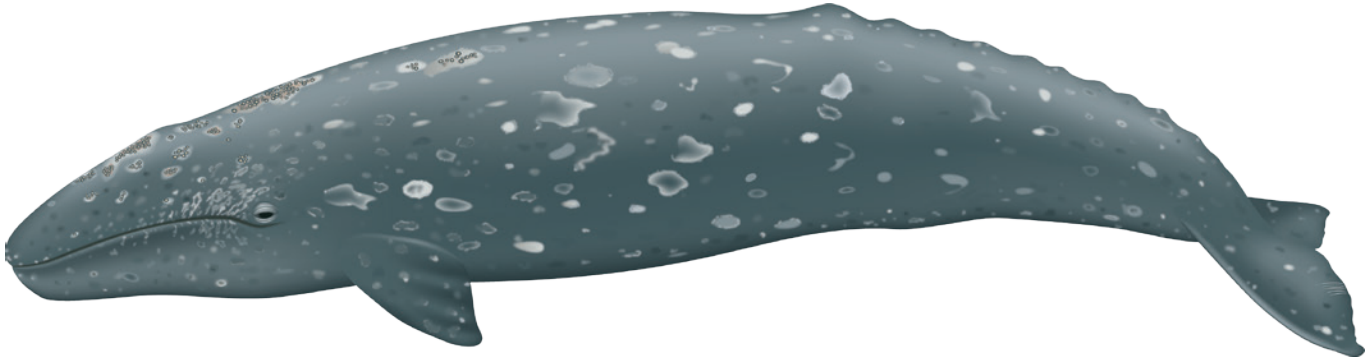


# Relative Abundance of Humpback Whales in B.C. Waters



# GREY WHALE

*Eschrichtius robustus*



**Average Adult Length:** 11-12 m / 36-40 ft

## SARA Status 2010

Not at Risk (NR)	Special Concern (SC)	Threatened (TH)	Endangered (EN)	Extirpated (EX)
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### Dorsal Fin

No dorsal fin, has knuckle-like bumps on lower back.

### Appearance

Mottled grey skin with scarring and varied pigmentation. Body and head are covered with patches of barnacles. Tail fluke has convex trailing edge with a deep notch in the middle. Heart or v-shaped blow.

### Behaviour

Occasionally lifts tail flukes when making a deep dive. Often feeds close to shore.

### Distribution

Only found in the North Pacific Ocean; eastern and western populations are distinct. The eastern population's migratory range spans from Baja California and the northwestern coast of Mexico's mainland to the Chukchi and Beaufort seas in the Arctic. On their northward migration, they usually pass the coast of B.C. starting in early spring and are found close to shore except when crossing open bodies of water (e.g. Queen Charlotte Sound and Hecate Strait). On the southbound migration in late-fall/early-winter, the whales travel further offshore. A small population remains resident in B.C. throughout the summer months<sup>19</sup>.

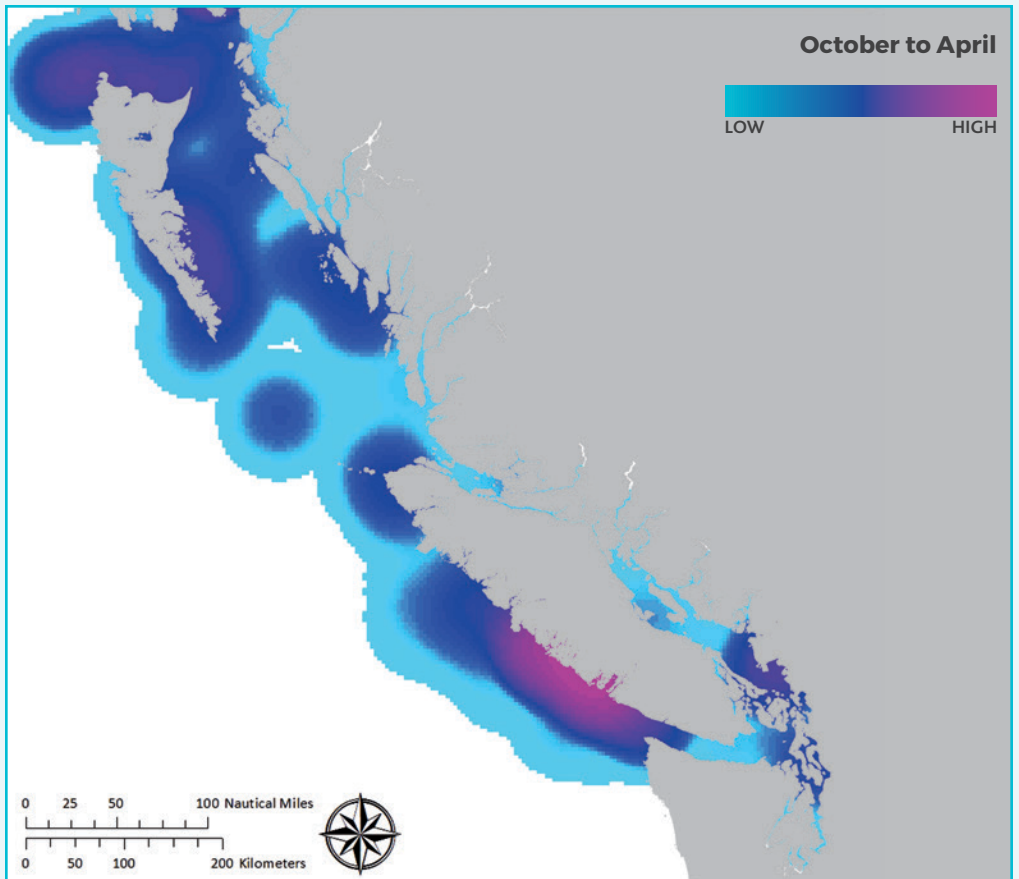
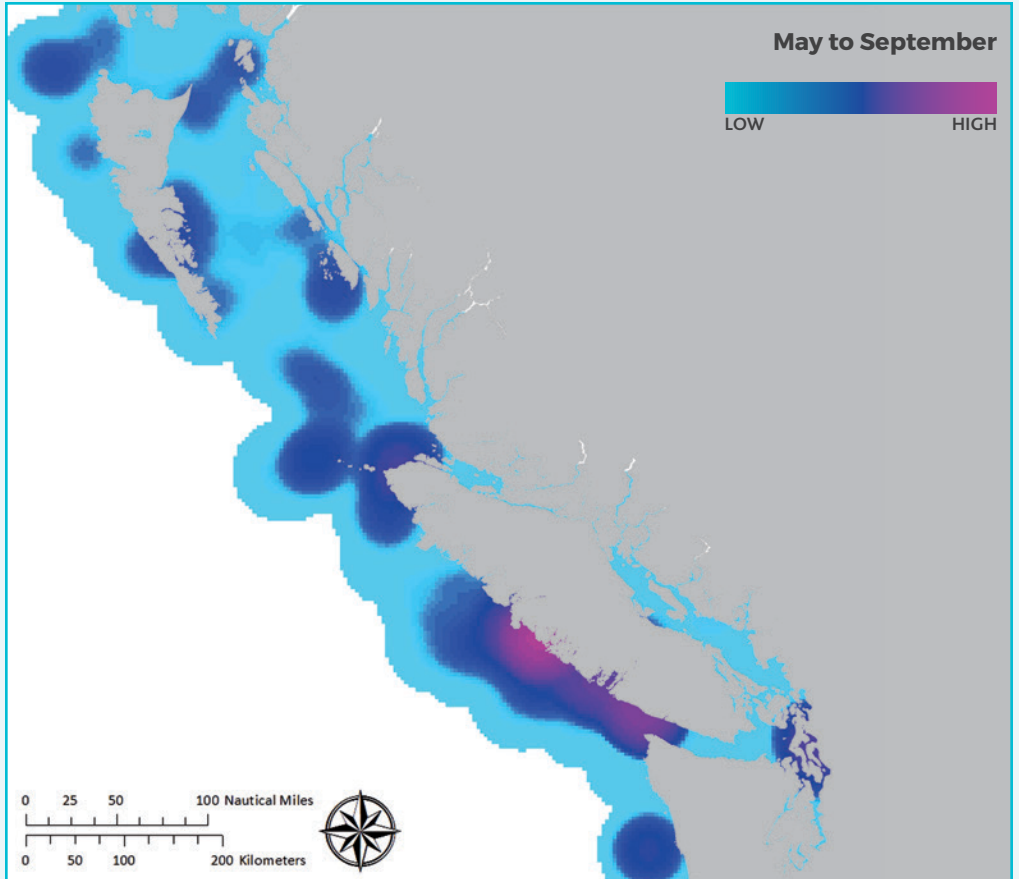
### Vulnerability of the Species

Like most large whale species, grey whales are threatened by vessel strikes<sup>29</sup>. While their tendency to travel close to shore in shallower waters may decrease their likelihood of interacting with large vessel traffic, recent studies have demonstrated that grey whale migration includes Hecate Strait and Dixon Entrance, both active shipping areas<sup>18</sup>.

Additionally, vessels may contribute toward acoustic and physical disturbance of grey whales, potentially disrupting feeding behaviours or displacing them from their habitat<sup>13</sup>.

Further threats include increased human activity in breeding lagoons, environmental variability, disruption and destruction of feeding habitat, toxic spills, physical disturbance, fossil fuel exploration and extraction, prey reduction, pollution, and entanglement in fishing gear (especially crab traps due to shallow water distribution)<sup>13</sup>.

# Relative Abundance of Grey Whales in B.C. Waters



# FIN WHALE

*Balaenoptera physalus*



**Average Adult Length:** 17-18 m / 56-59 ft

## SARA Status 2013



### Dorsal Fin

Prominent and sickle-shaped, located far back on body.

### Appearance

Dark grey back, often with lighter grey swirled markings behind the head. Right lower lip is white while left is dark. Streamlined body shape with tapered head. Skin may have a brownish tinge caused by diatoms. Tall, narrow blow.

### Behaviour

Usually does not lift tail when diving. Fast swimmer.

### Distribution

Found in all the world's oceans. The North Pacific population has been reported from the Gulf of California to the Gulf of Alaska (potentially two separate populations). Migrate to high latitudes in the summer for feeding, and to warm waters in the winter for breeding. Found mostly near or off the continental shelf, occasionally in near-shore deep water.

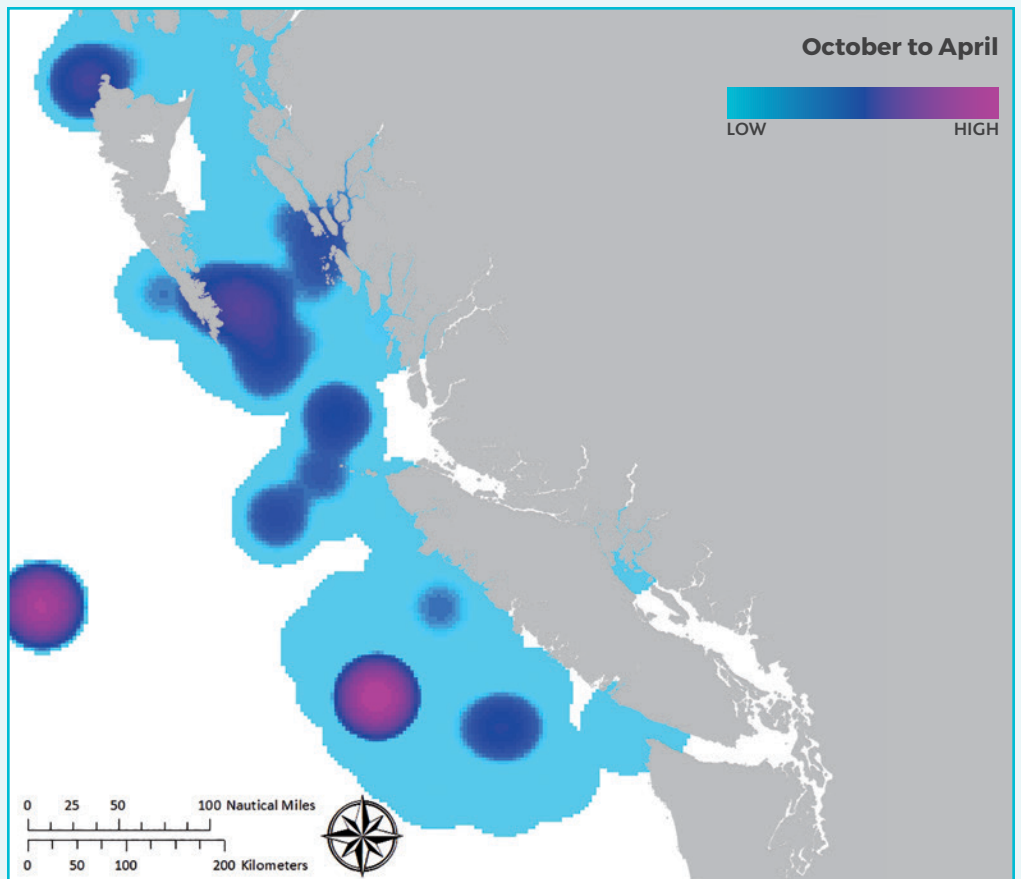
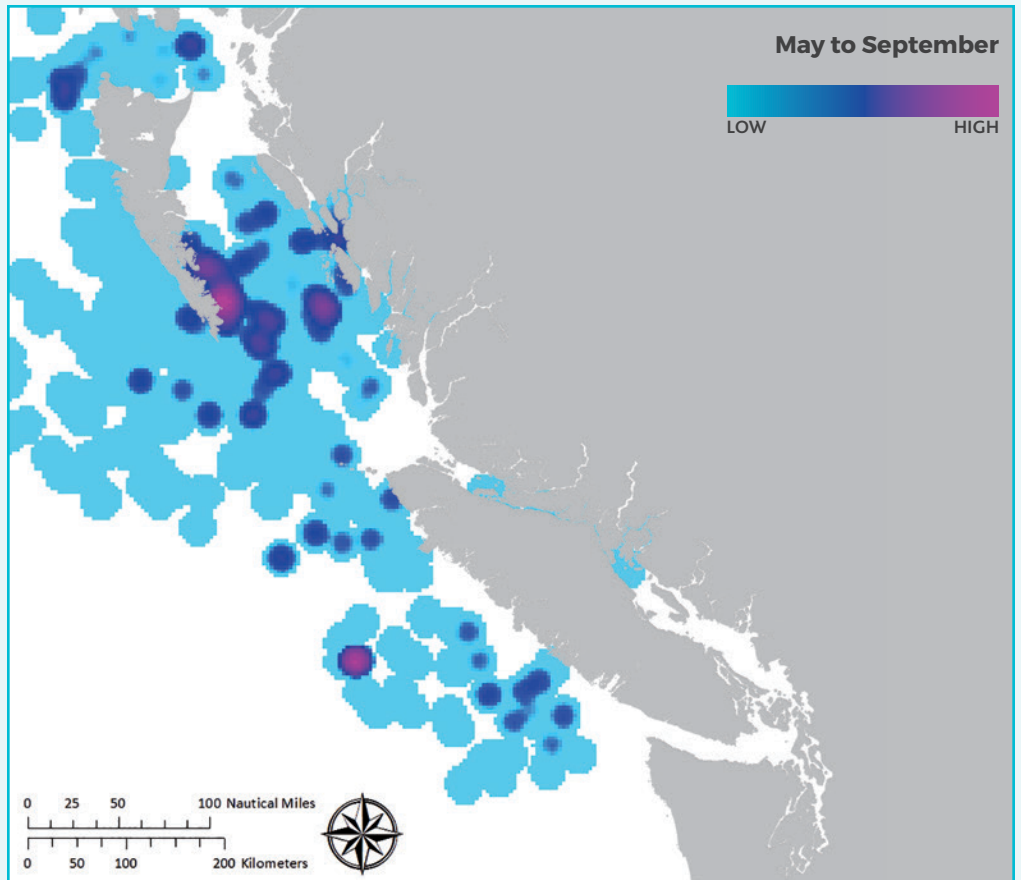
### Vulnerability of the Species

Fin whales are the most commonly struck whale species worldwide<sup>29, 26, 6</sup>, and vessel strikes are the greatest human-caused threat to fin whales in B.C. As fin whales are distributed along the shelf-break, they are in locations that frequently coincide with shipping lanes<sup>20</sup>. Additionally, vessel noise may cause disturbance and mask the low-frequency calls of fin whales<sup>17</sup>.

Further threats to fin whales include entanglement in fishing gear and debris, pollution, and habitat displacement by changes in ocean climate and prey distributions<sup>17</sup>.



# Relative Abundance of Fin Whales in B.C. Waters



# COMMON MINKE WHALE

*Balaenoptera acutorostrata*



Average Adult Length: 8 m / 26 ft

## COSEWIC Status 2006

Not at Risk NR	Special Concern SC	Threatened TH	Endangered EN	Extirpated EX
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### Dorsal Fin

Sharply curved dorsal fin, located far back on body.

### Appearance

Dark grey back, often with lighter grey swirled markings behind the head. Distinctive white band on top of each pectoral flipper. Pointed head with prominent nose ridge. Body slender and streamlined. Blows rarely visible.

### Behaviour

Usually elusive and solitary. Surfaces 1-2 times between dives.

### Distribution

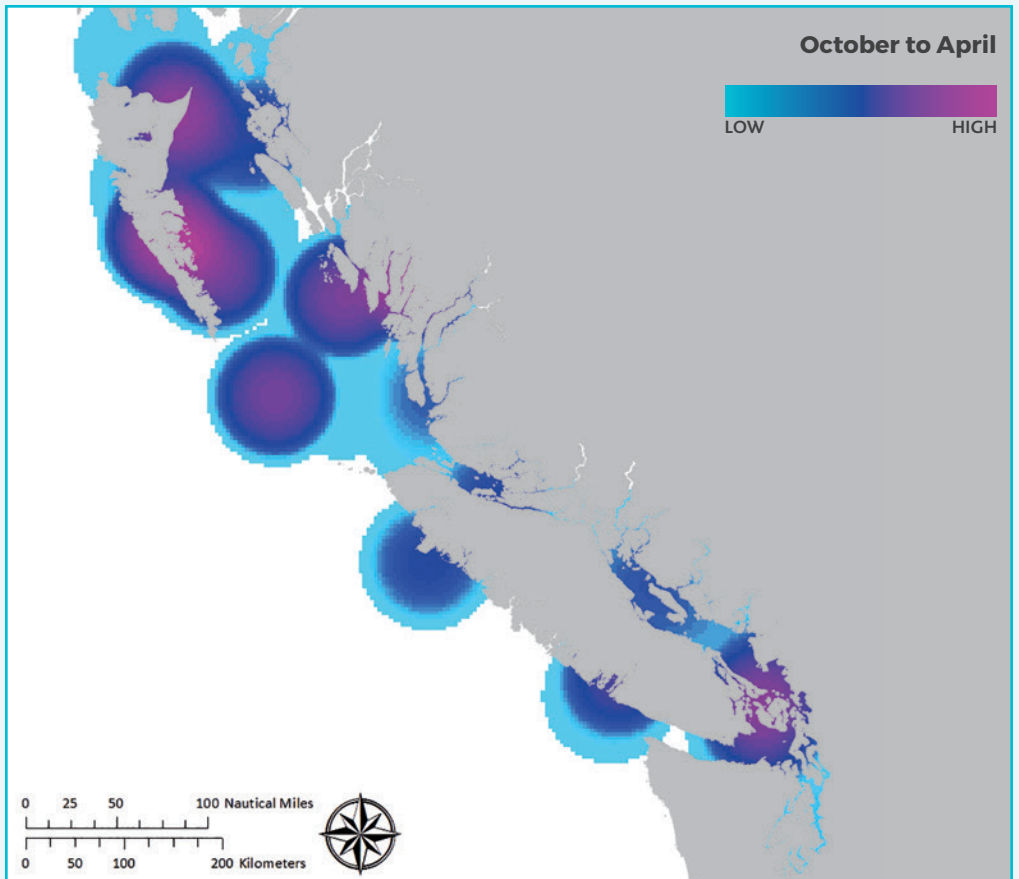
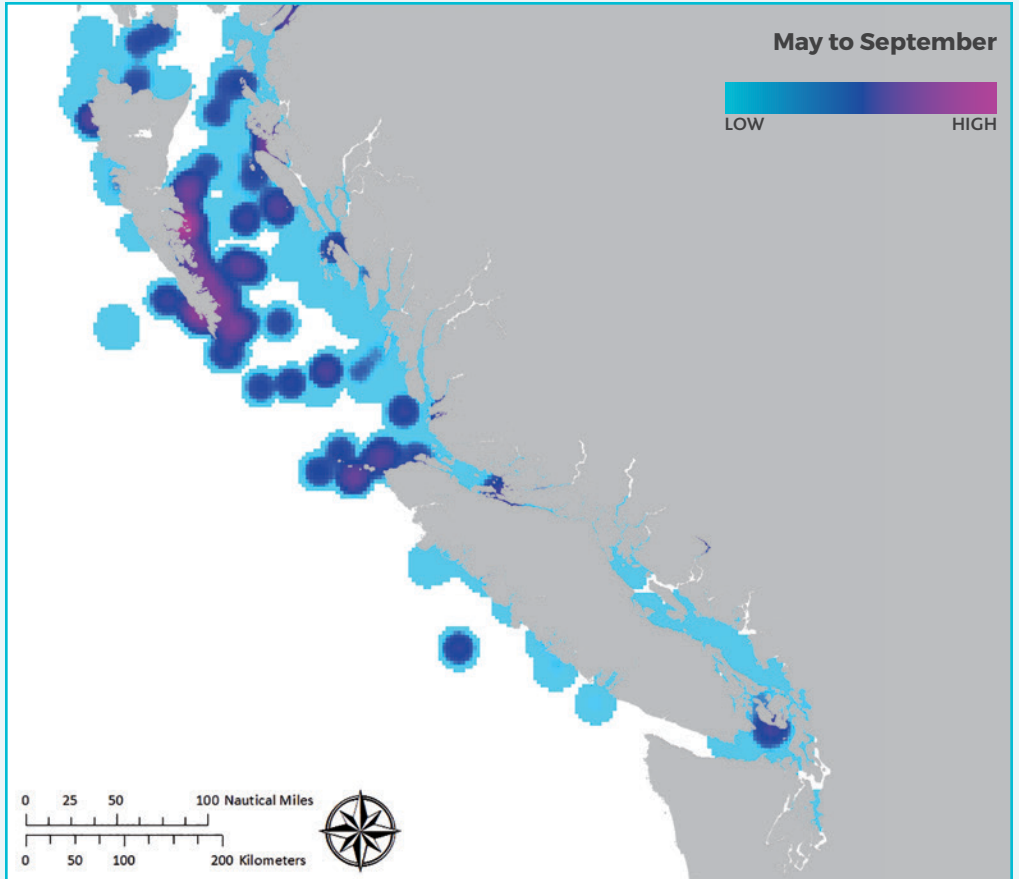
Distributed in both the northern and southern hemispheres, and have been observed year round in B.C., although more commonly seen in summer months. Found in shallow coastal areas and can be found offshore.

### Vulnerability of the Species

Vessels can negatively affect minke whales due to risk of strikes<sup>50</sup>, and pose threats associated with pollution and disturbance.

Entanglement in fishing gear is one of the largest human-caused threats to minke whales in B.C.<sup>19</sup>.

# Relative Abundance of Minke Whales in B.C. Waters





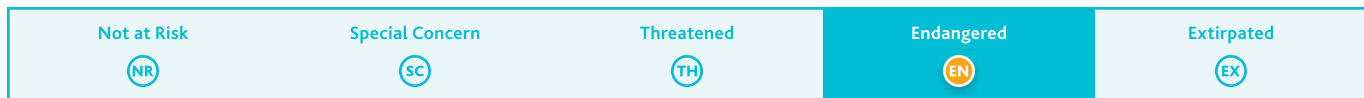
# BLUE WHALE

*Balaenoptera musculus*



Average Adult Length: 21-22 m / 69-72 ft

## SARA Status 2013



### Dorsal Fin

Variable shape, often rounded at tip. Very small relative to body.

### Appearance

Blue grey, mottled colouring. Dorsal fin generally not seen until long after blow appears and head has submerged. Head is broad and flat with a raised "splashguard" in front of blowhole. Column-shaped blow 9 m (30 ft) tall.

### Behaviour

Often raises tail when diving.

### Distribution

Found in all the world's oceans. The eastern North Pacific population ranges from Central America to the Gulf of Alaska. Seasonal movements are not fully understood, but it is generally accepted that the species migrates south to Baja California (especially the Gulf of California) and west of Costa Rica in the winter, moving north off California, B.C. and the Gulf of Alaska in the spring and summer. Primarily found in offshore waters, occasionally in coastal and shelf waters.

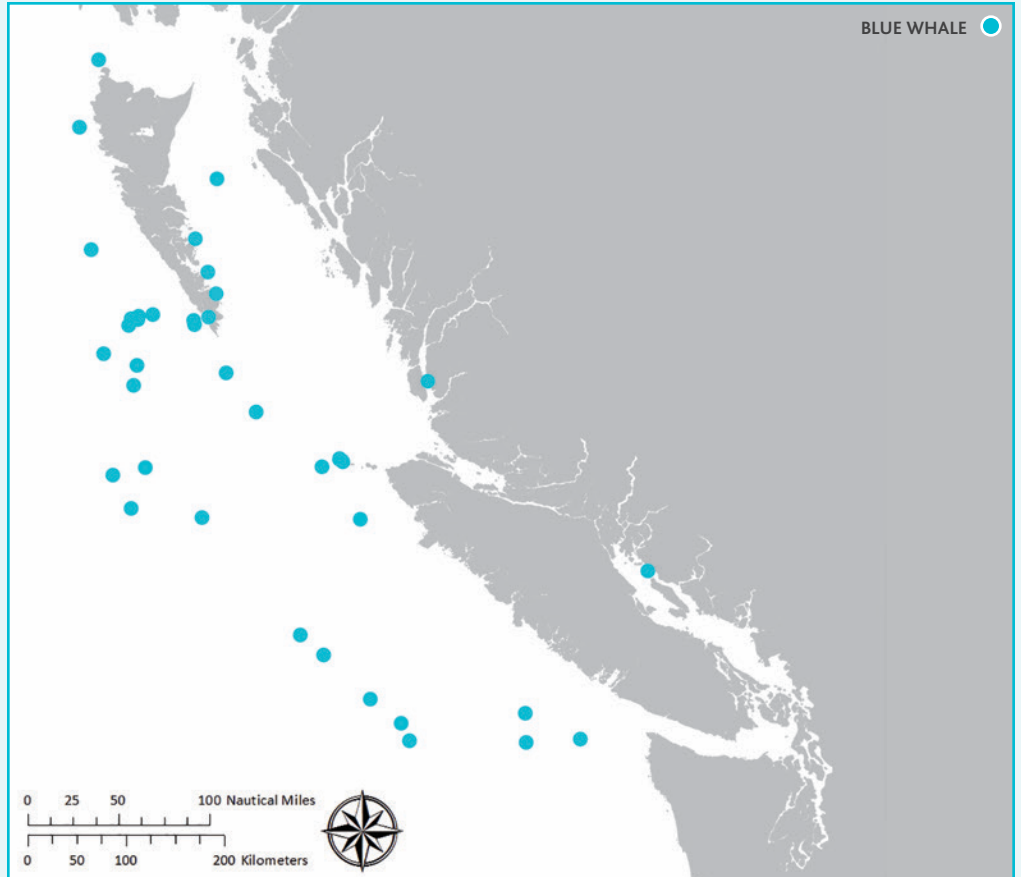
### Vulnerability of the Species

Vessel strikes are one of the most significant human-caused threats to blue whales. Blue whales may be particularly vulnerable to strikes due to their tendency to feed at the surface and their slow and shallow dive response to vessels<sup>33</sup>. Blue whales spend more time at or near the surface at night when they are more difficult to see and avoid<sup>2</sup>.

Additionally, vessels pose a threat to blue whales due to acoustic disturbance, which may mask their communication calls<sup>17</sup>.

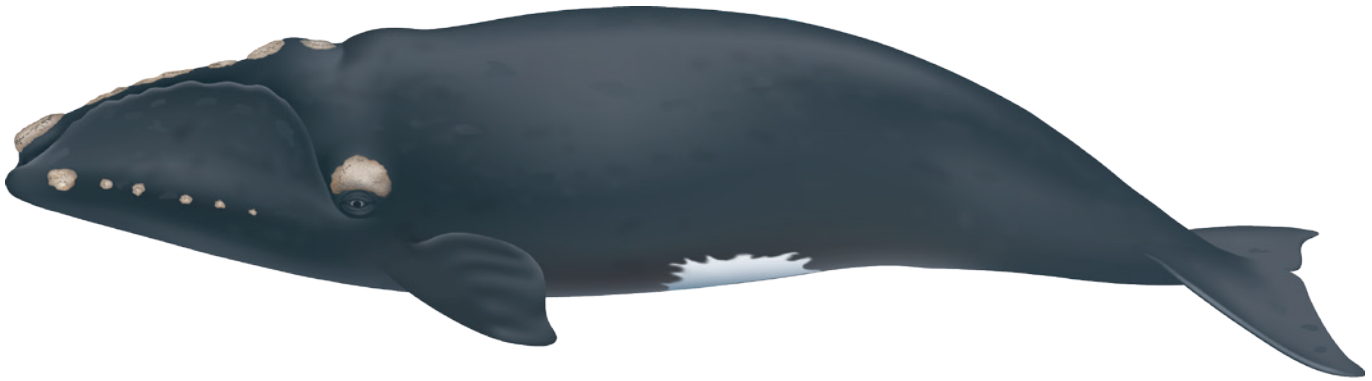
Further threats to blue whales include entanglement in fishing gear and debris, pollution, and habitat displacement caused by changes in ocean climate or food web<sup>17</sup>.

# Blue Whale Sightings in B.C. Waters



# NORTH PACIFIC RIGHT WHALE

*Eubalaena japonica*



**Average Adult Length:** 17 m / 56 ft

## SARA Status 2011

Not at Risk (NR)	Special Concern (SC)	Threatened (TH)	<b>Endangered (EN)</b>	Extirpated (EX)
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### Dorsal Fin

No dorsal fin present and no dorsal ridge evident.

### Appearance

Dark grey to black body with large, white callosities (small, irregular knobs of calloused skin) on the head. White patches on the side of the belly. Very rotund shape with short pectoral flippers. Mouth line is strongly arched downwards. Tail flukes are very triangular. Wide, V-shaped blow.

### Behaviour

May raise tail when diving. Feeds by swimming slowly along the surface with mouth agape.

### Distribution

**Extremely rare.** Historically found across the entire North Pacific (eastern and western North Pacific populations considered discrete).

### Vulnerability of the Species

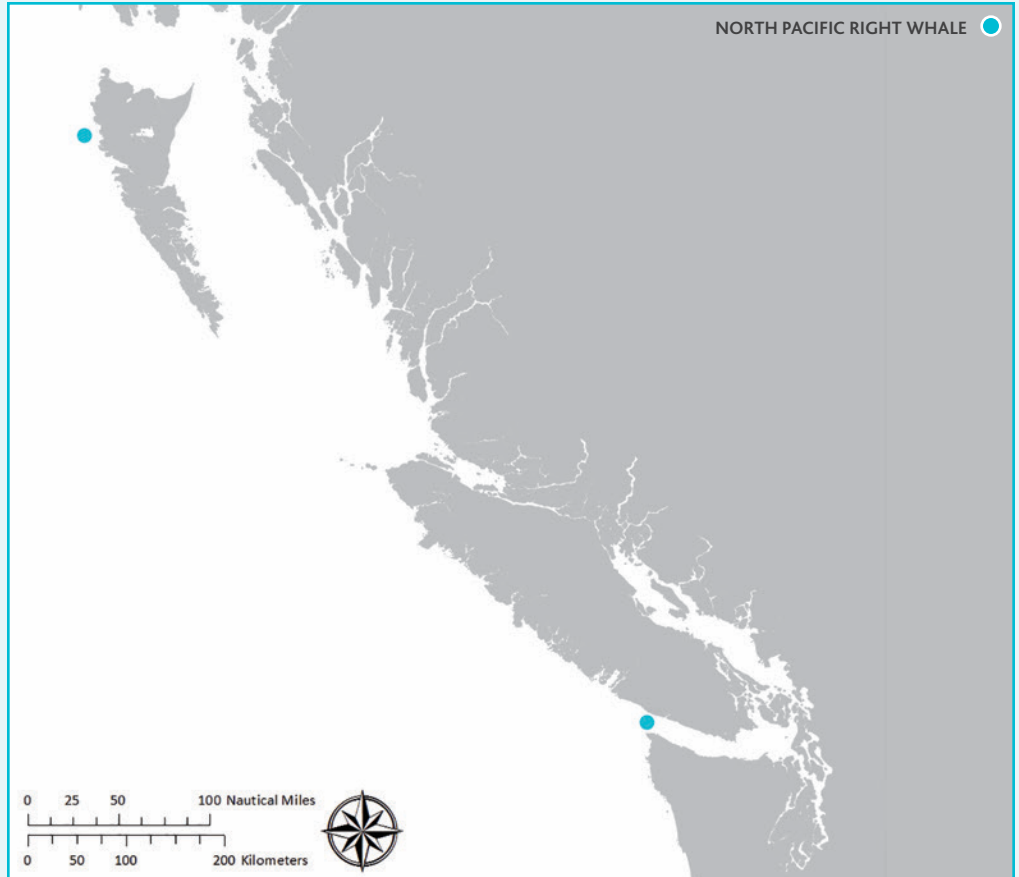
Small population size is a critical threat to North Pacific right whales, making their species especially vulnerable to threats such as vessel strikes, as the loss of one individual could have drastic effects on the population's chances of recovery<sup>29</sup>. In the North Atlantic, it has been found that vessel strikes are the most significant human-caused source of injury and mortality for right whales<sup>26</sup>. Right whales show very low responsiveness to vessels<sup>38</sup>, have slow swimming speeds, and spend a significant amount of time at the surface resting, feeding, nursing and mating, making them very vulnerable to strikes<sup>29</sup>.

Further threats to North Pacific right whales include entanglement in fishing gear, noise and pollution<sup>17, 44</sup>.

**NOTE:** North Pacific right whales are extremely rare. Two sightings in 2013 of two different individual animals were the first confirmed observations of this species in over 60 years. **If you see one, please call 1 866 I SAW ONE immediately.** They are featured in this guide due to their significant vulnerability to vessel collisions and to highlight the importance of reporting this species.



# North Pacific Right Whale Sightings in B.C. Waters



# LESS COMMON BALEEN WHALES

## SEI WHALE

*Balaenoptera borealis*



**Average Adult Length:** 13 m / 43 ft

### Description

Dark to bluish grey, often with grey to white circular scars. Dorsal fin is strongly curved towards back, generally more erect compared to a fin whale, and positioned less than 2/3 from the front of the body. Lower jaw is dark on both sides of the head.



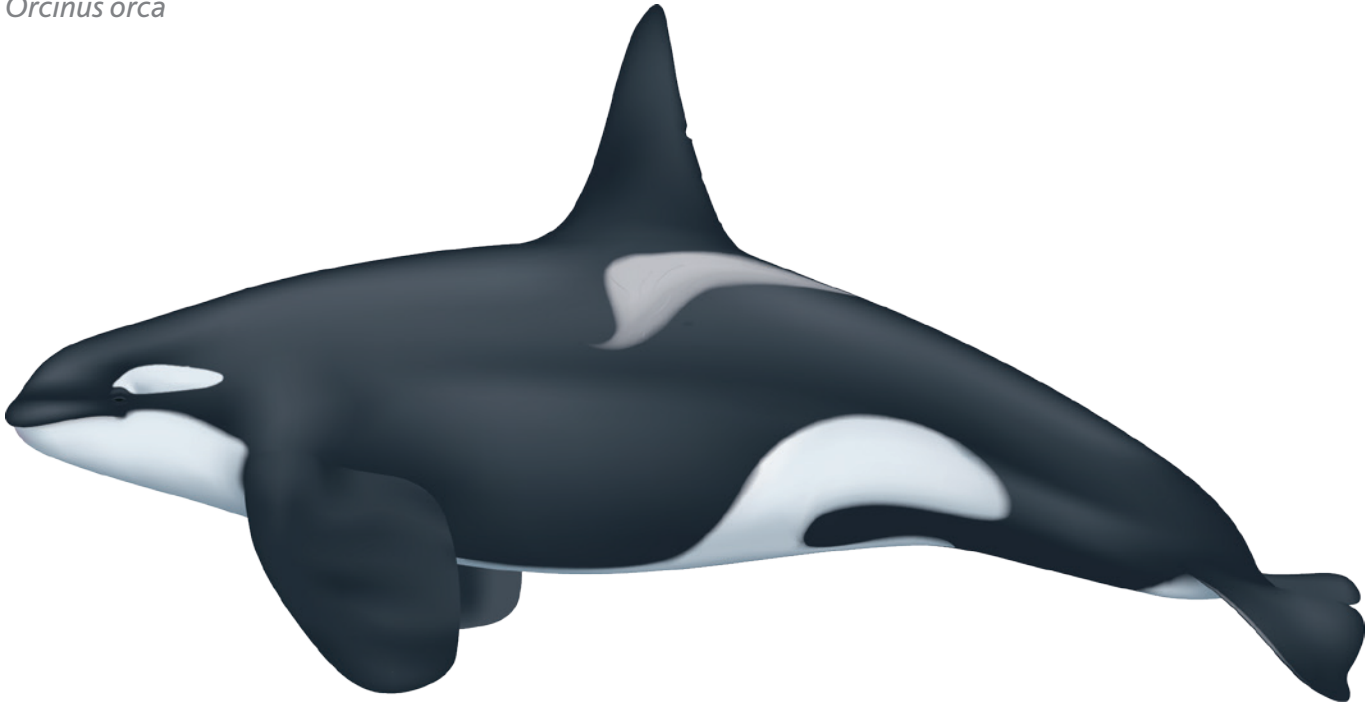
# Toothed Whales





# KILLER WHALE / ORCA

*Orcinus orca*



**Average Adult Length:** 6-8 m / 20-26 ft

## Southern Resident SARA Status 2011

Endangered

NR

## Northern Resident SARA Status 2011

Threatened

TH

## Bigg's SARA Status 2007

Threatened

TH

## Offshores SARA Status 2009

Threatened

TH

### Dorsal Fin

Short and curved in juvenile and female whales, tall in mature males up to 1.8 m in height.

### Appearance

Distinctive pattern with black on the back, white on the belly, white-grey "saddlepatch" behind the dorsal fin and white "eyepatch" located just behind the eye. Tail flukes are black on top and white underneath.

### Behaviour

Can be very acrobatic and active at the surface.

### Distribution

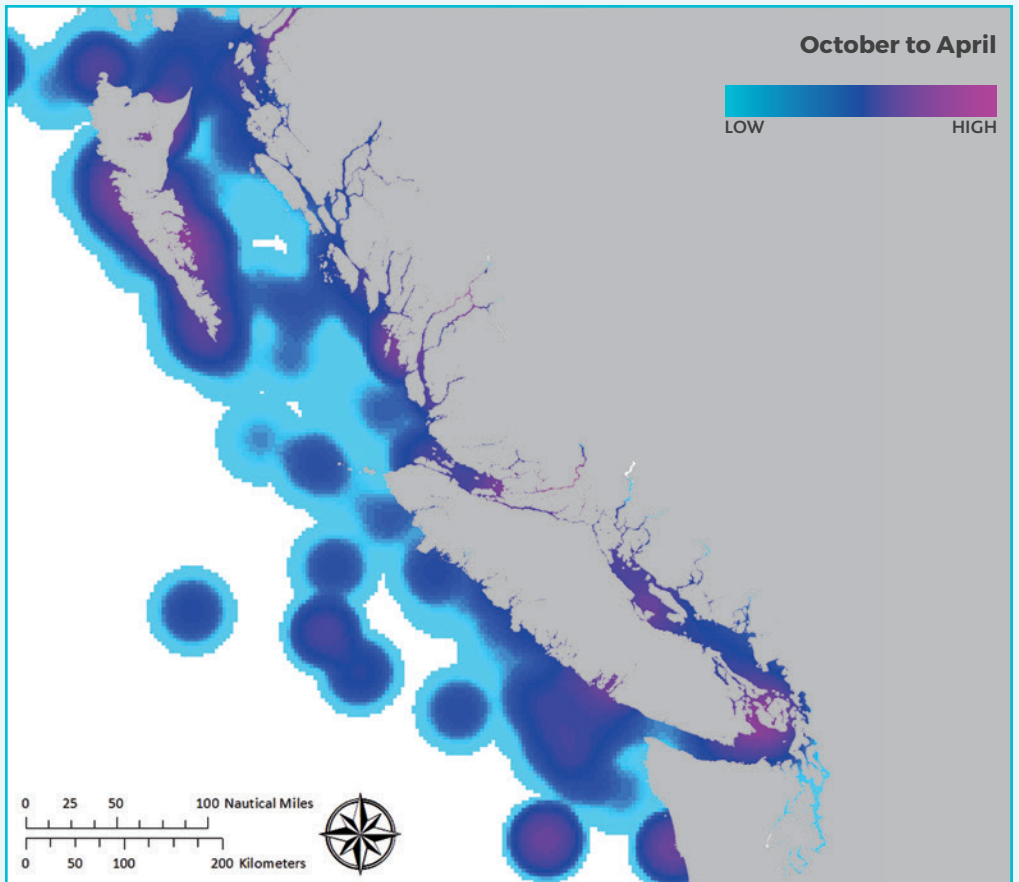
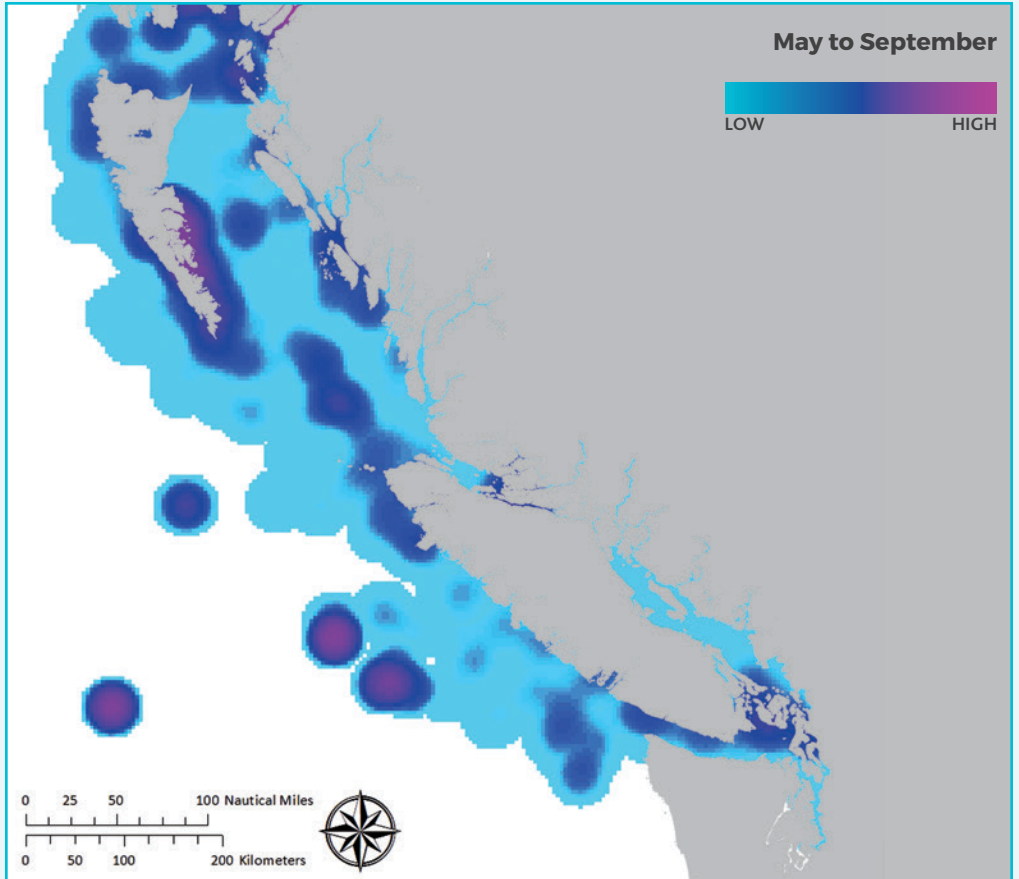
Three types of killer whales exist in B.C.: resident killer whales, Bigg's killer whales and offshore killer whales. Resident killer whales are observed throughout B.C. waters, but are most common south and east of Vancouver Island and in larger channels and passages on the central and north coast. They are usually seen in groups of 10 or more. Bigg's killer whales are more commonly seen in smaller groups, often very close to shore, among islands, and in or near bays and inlets. Offshore killer whales are usually found in groups of 10 to 50 or more and are most commonly seen in continental shelf waters west of Vancouver Island and Haida Gwaii<sup>19</sup>. In B.C., killer whales

are subject to intensive whale watching by private and commercial vessels in the summer months, and vessel crews may be alerted to their presence by clusters of small vessels.

### Vulnerability of the Species

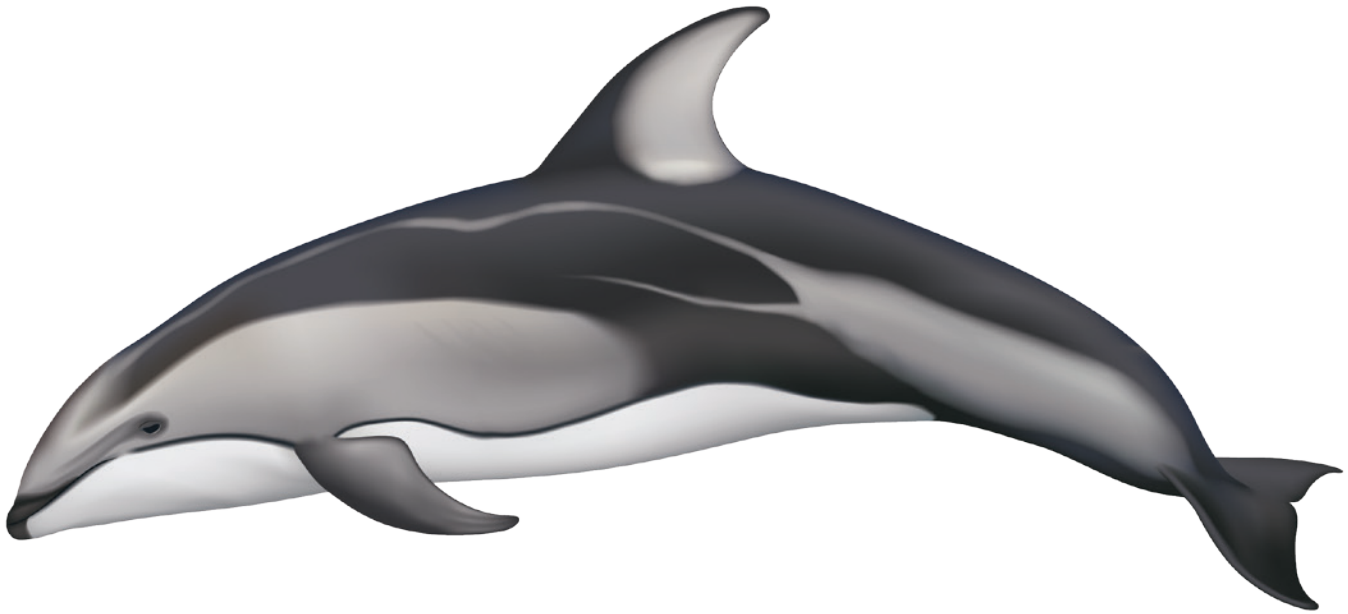
The greatest impact of vessels on killer whales is noise and physical disturbance, which impairs and masks both their communication and echolocation, and can interrupt important behaviours such as foraging, group cohesion, resting and mating<sup>8, 54</sup>. Vessel strikes are relatively rare, but when they occur they usually cause serious injury or death (Spaven *et al.* 2013). Further human-caused threats to killer whales include injuries associated with depredation (whales taking fish off fishing lines), entanglement in fishing gear, contaminants and pollution, and competition for fish stocks<sup>15, 11, 10</sup>.

# Relative Abundance of Killer Whales in B.C. Waters



# PACIFIC WHITE-SIDED DOLPHIN

*Lagenorhynchus obliquidens*



Average Adult Length: 2.5 m / 8 ft

## COSEWIC Status 1990

Not at Risk NR	Special Concern SC	Threatened TH	Endangered EN	Extirpated EX
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### Dorsal Fin

Grey and white bi-coloured, very curved, located in the middle of the back.

### Appearance

Back is dark-grey to black, sides are striped light and dark grey, and belly is white. Tip of the beak is black, and visible when out of water.

### Behaviour

Often leap completely clear of water. Create a "rooster-tail" of spray when swimming quickly. Often in groups of 50 or more.

### Distribution

Only found in the North Pacific. The eastern North Pacific population occurs from southern Gulf of California to the Gulf of Alaska. It is the most abundant cetacean species in B.C., found in most coastal and offshore waters of the province.

### Vulnerability of the Species

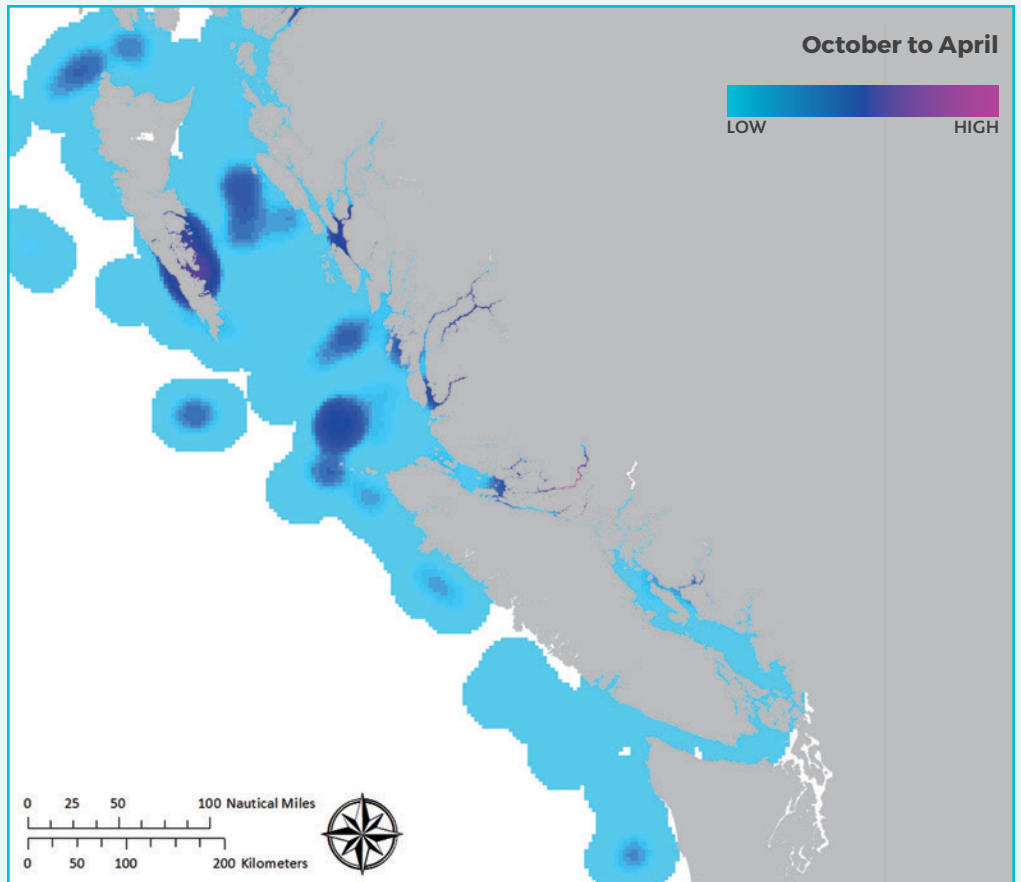
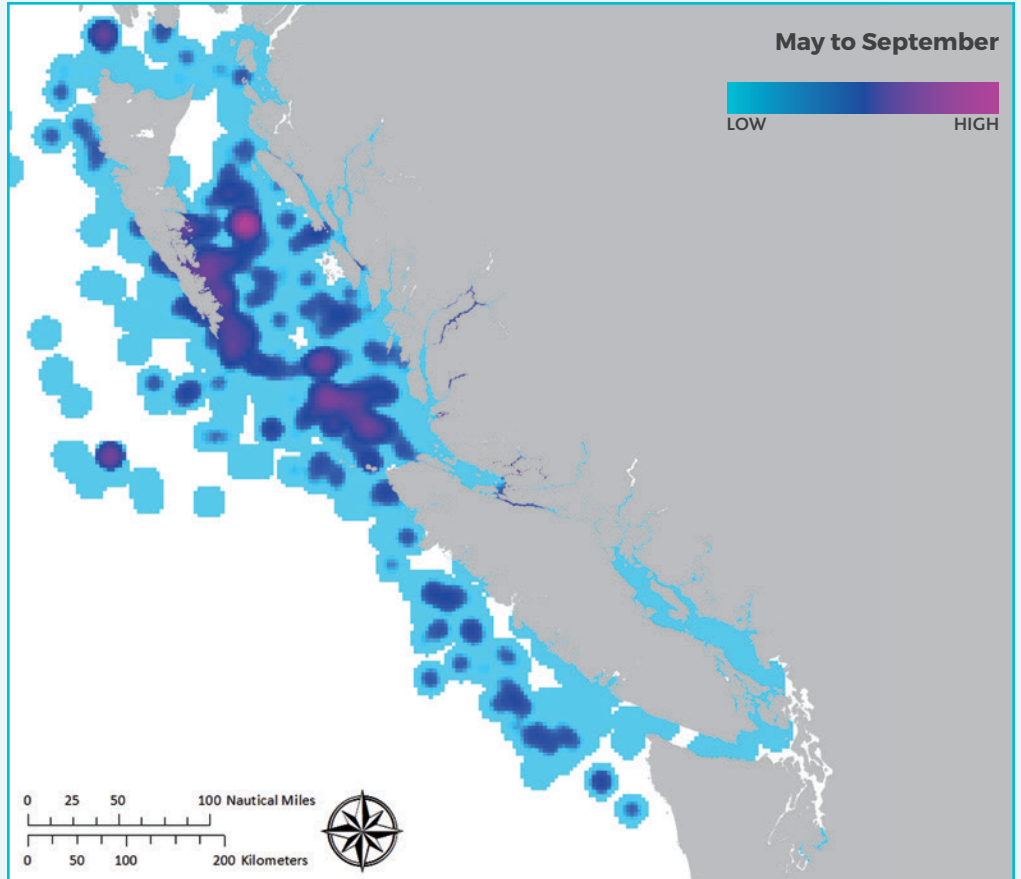
Researchers and ecotourism professionals in British Columbia have observed Pacific white-sided dolphins with injuries or scars consistent with vessel strikes, although the prevalence of strikes to this species is believed to be low<sup>21,23</sup>.

Pacific white-sided dolphins have a tendency to approach vessels and bow-ride, which may increase the risk of vessel strikes.

Historically, bycatch from drift gillnet fisheries for salmon and squid caused a significant decline to Pacific white-sided dolphin populations. The moratorium placed on the practice in 1993 greatly decreased mortality due to bycatch<sup>18</sup>.

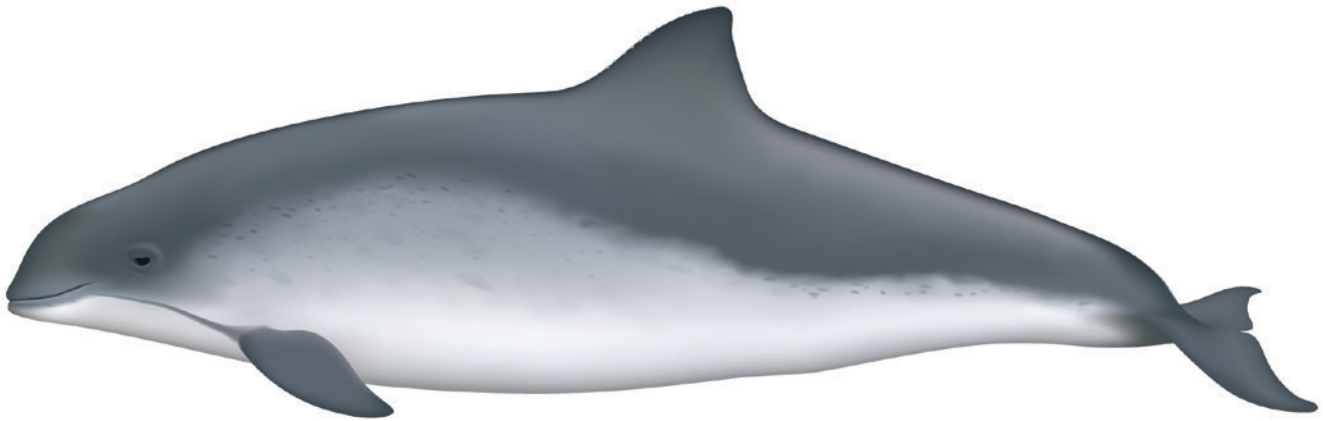


# Relative Abundance of Pacific White-Sided Dolphins in B.C. Waters



# HARBOUR PORPOISE

*Phocoena phocoena*



Average Adult Length: 1.5 m / 5 ft

## SARA Status



### Dorsal Fin

Triangular, blunt, uniformly grey.

### Appearance

Uniform colouration, dark grey-brown back with a lighter belly and speckled greyish white area along the sides. Lighter sides or belly not usually seen when surfacing. Chunky body with small pectoral flippers.

### Behaviour

Often inconspicuous and travel slowly. Generally spotted alone or in small groups of 2-3. Larger aggregations may occur occasionally.

### Distribution

Found in the North Pacific, North Atlantic and the Black Sea. Pacific population ranges from Point Conception California, north through B.C. and Alaska to the southern Beaufort and Chukchi Sea, and west to Japan. Present in B.C. year-round in shallow waters, as well as on the outer coast.

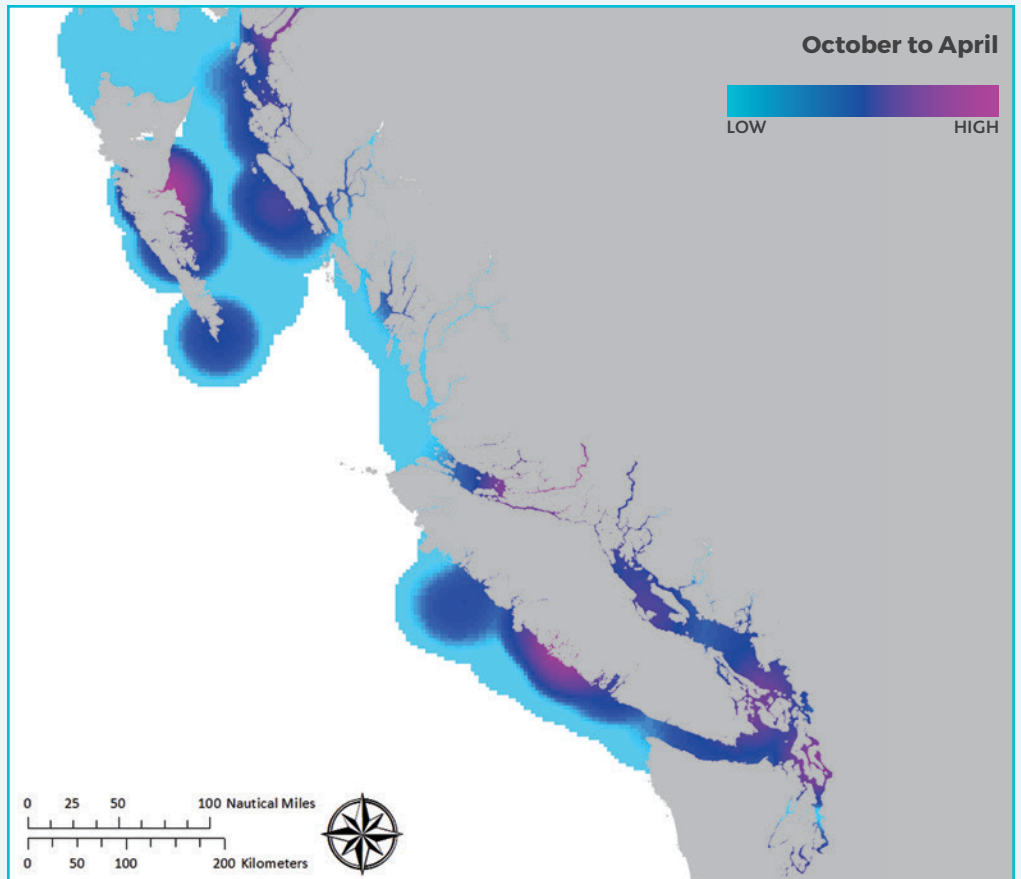
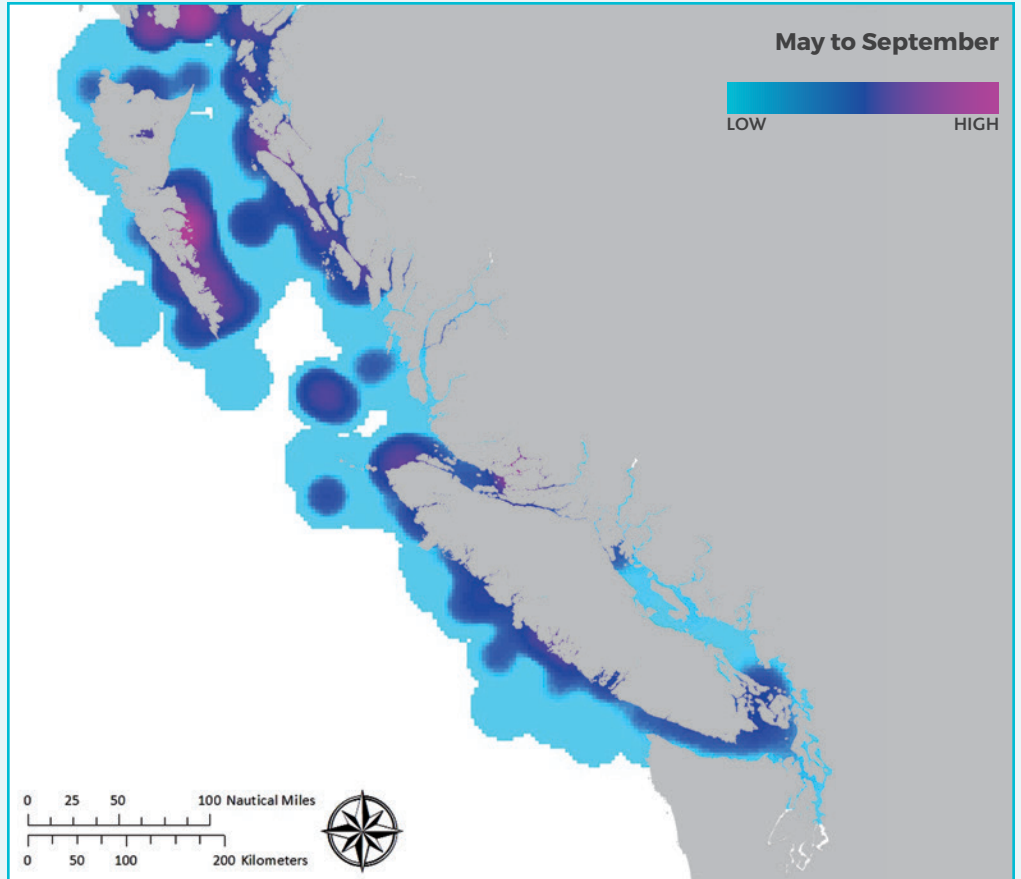
### Vulnerability of the Species

Harbour porpoise habitat in B.C. includes narrow, coastal waterways and areas close to urban centres exposing them to close contact with vessels. As the smallest cetacean in B.C., they are easy to miss, particularly in choppy seas.

Vessels may acoustically disturb harbour porpoise, which may interfere with foraging, navigating or social communication, and cause them to leave or not enter an area<sup>12</sup>.

Further threats include entanglement, habitat degradation, toxic spills, contaminants and reduction in prey<sup>12</sup>.

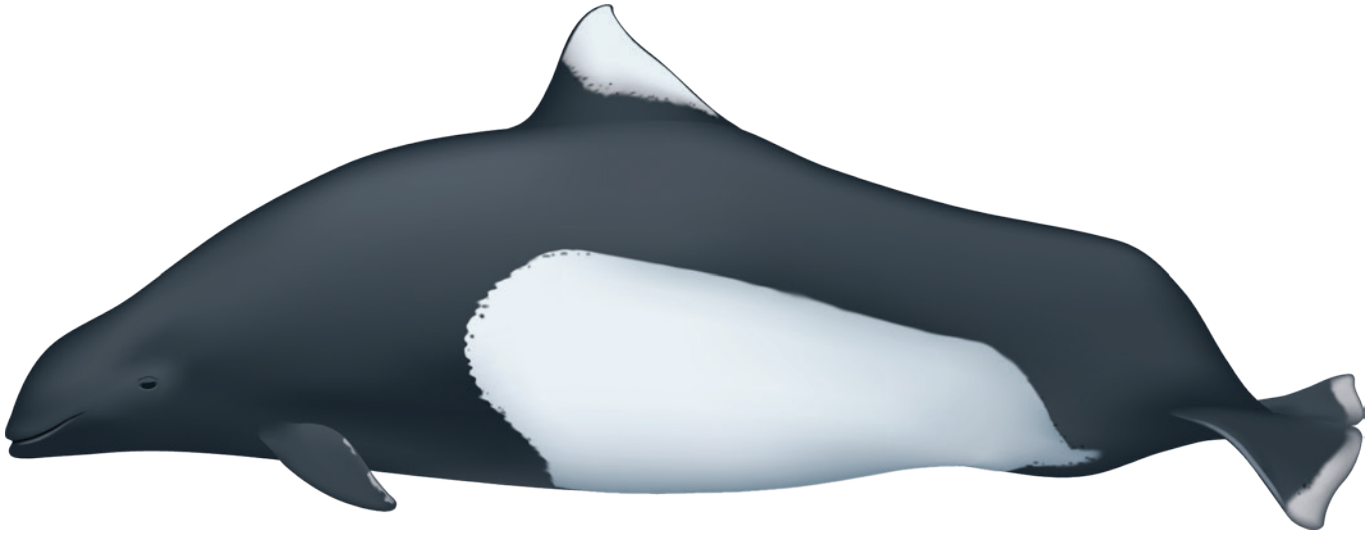
# Relative Abundance of Harbour Porpoise in B.C. Waters





# DALL'S PORPOISE

*Phocoenoides dalli*



Average Adult Length: 2 m / 6.5 ft

## COSEWIC Status 1989



### Dorsal Fin

Small, triangular, black with a white tip.

### Appearance

Black back with prominent white flanks. Body is chunky with a small head and flippers. Small hump on tailstock before the flukes is evident when surfacing slowly.

### Behaviour

Usually travel in groups of 2-10 animals. Create "rooster-tail" of spray when swimming quickly. Often approach vessels to bow-ride.

### Distribution

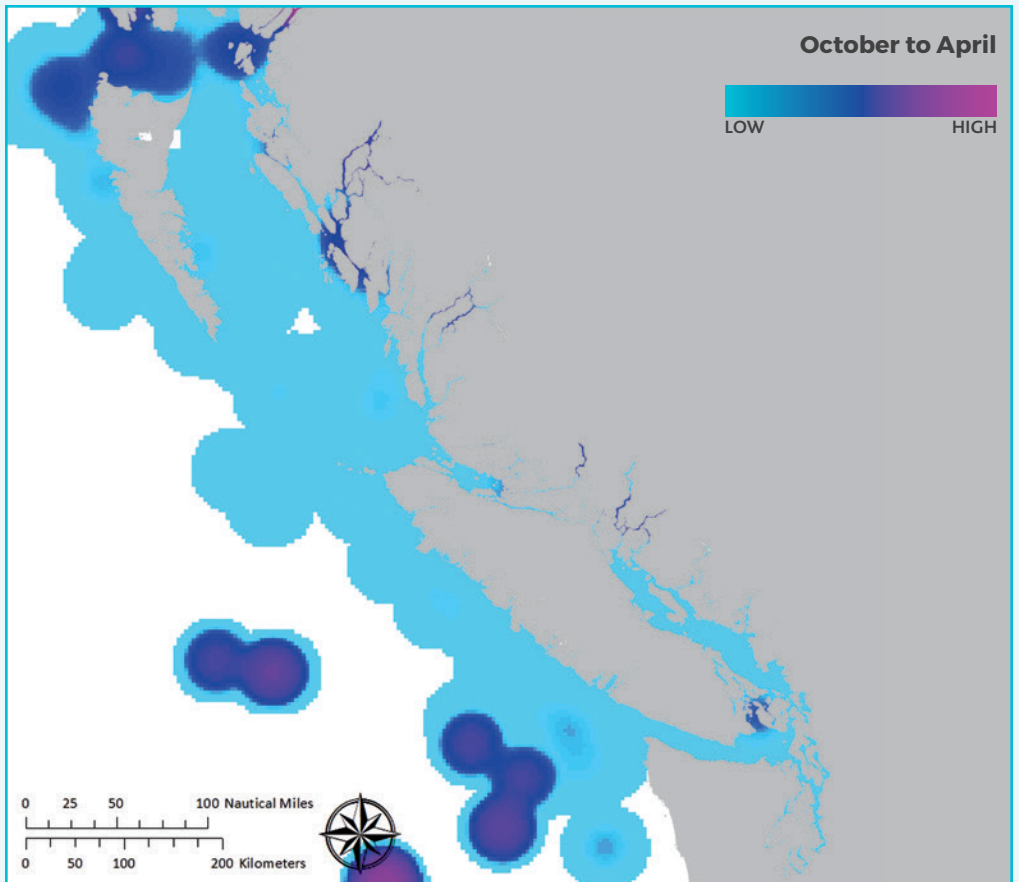
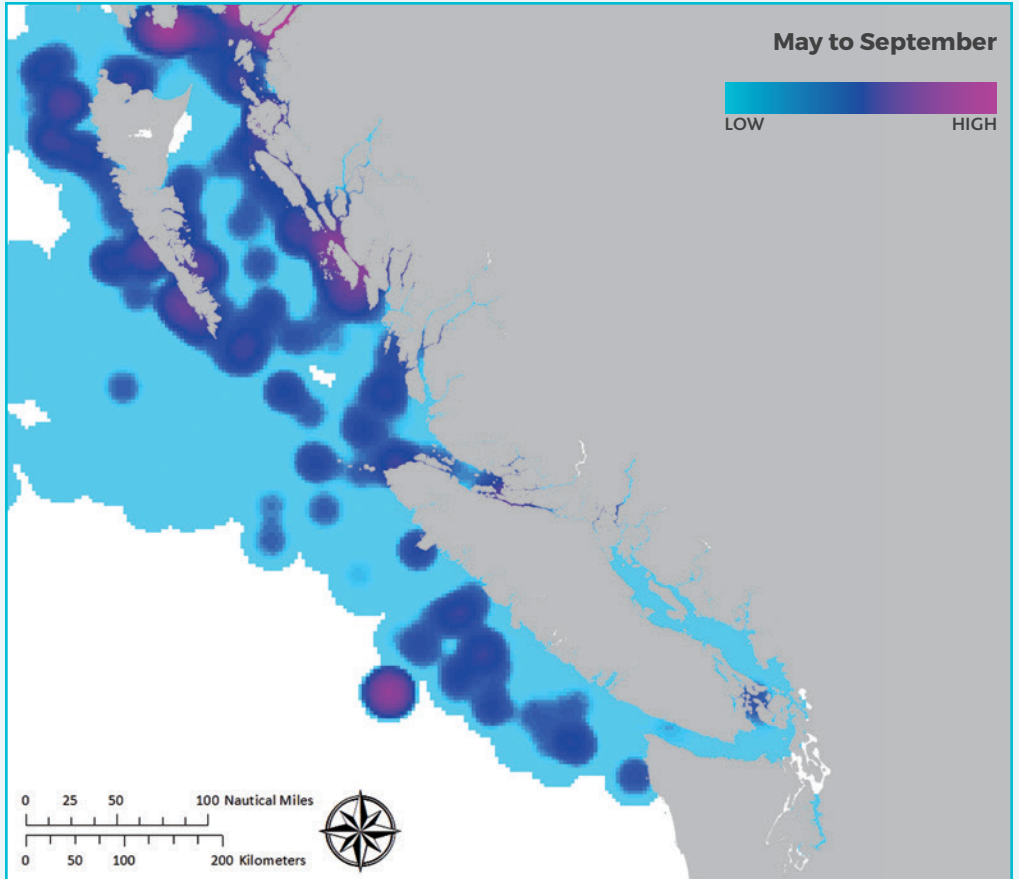
Endemic to North Pacific Ocean and adjacent Bering, Okhotsk, and Japan Sea. Widely distributed year-round in B.C.

### Vulnerability of the Species

Dall's porpoise have a tendency to approach vessels and bow-ride, which may increase the risk of vessel strike.

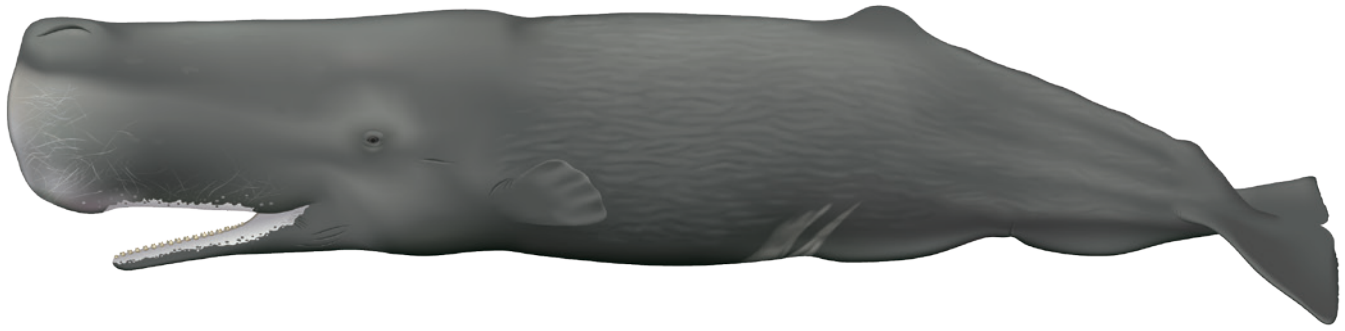
An additional threat to Dall's porpoise in B.C. is entanglement in fishing gear<sup>19</sup>.

# Relative Abundance of Dall's Porpoise in B.C. Waters



# SPERM WHALE

*Physeter macrocephalus*



**Average Adult Length:** 11-13 m / 36-42 ft

## COSEWIC Status 1996



### Dorsal Fin

Triangular/rounded hump, followed by knuckles toward tail fluke.

### Appearance

Dark brownish-grey in colour. Distinct, huge square-shaped head. Blowhole located very far forward on the head and on the left side (not centred). Skin appears wrinkled. Each half of tail fluke is the shape of a right triangle, with a distinctive "V" notch in the middle. Distinctive low, bushy blow from near the front of the head, angled to the left.

### Behaviour

Lifts broad triangular tail flukes high in air before diving. Takes long dives, often 30-40 minutes in length.

### Distribution

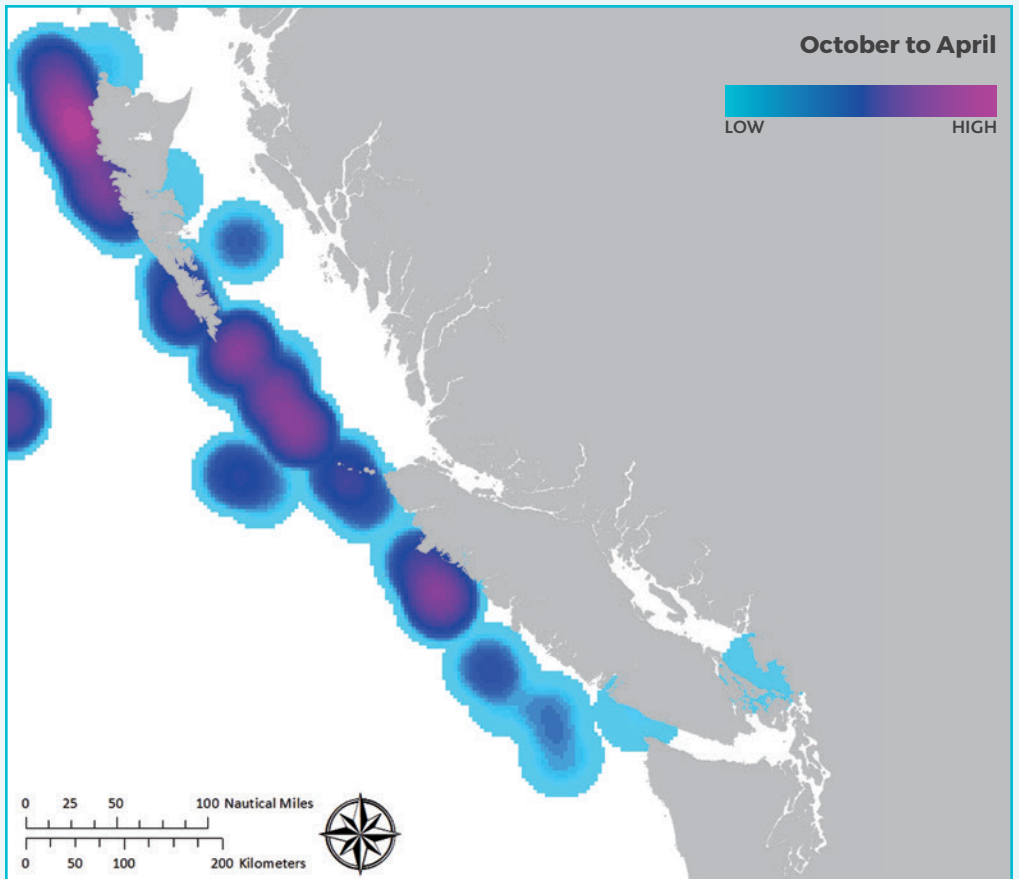
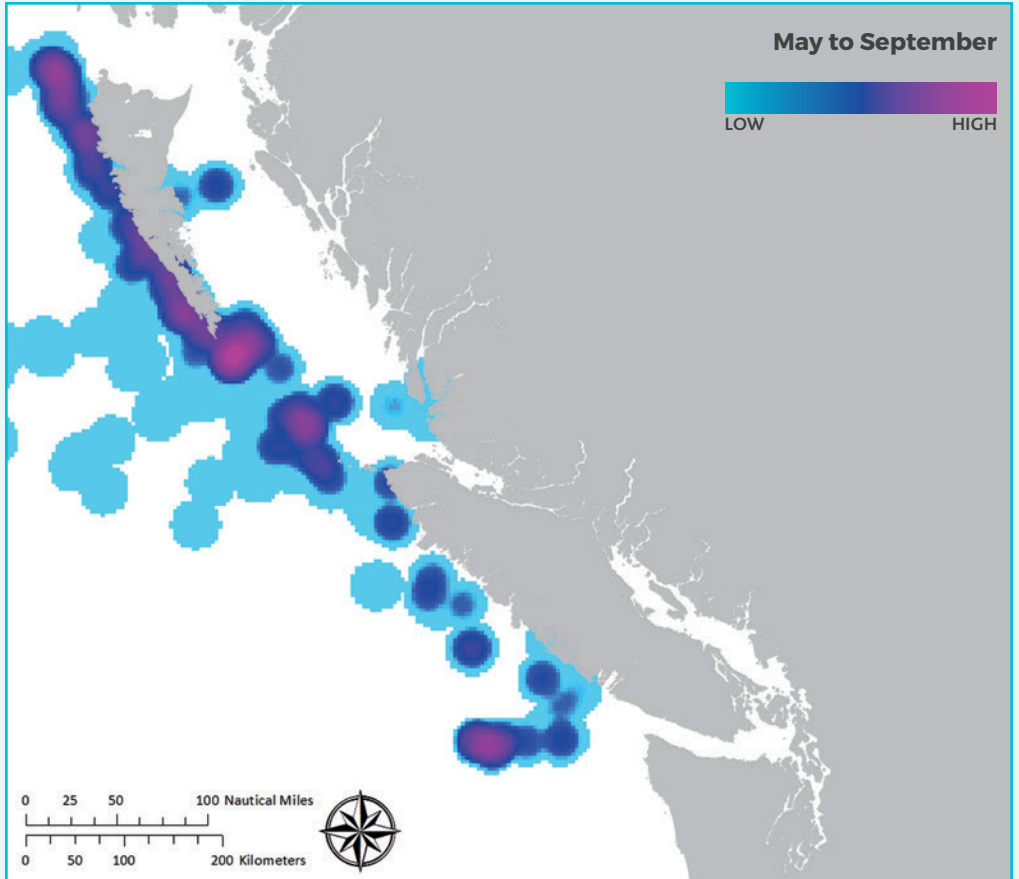
One of the most widespread cetaceans in the world. Found in productive coastal and deep waters surrounding oceanic islands. During the summer months, females and their young tend to be found further offshore than males. In B.C., primarily found along and off the continental shelf edge<sup>19</sup>.

### Vulnerability of the Species

Sperm whales are vulnerable to vessel strikes<sup>29</sup>. Strikes to this species may be underreported or observed due to their far offshore distribution, causing carcasses to sink before stranding (Spaven *et al.* 2013).

Further threats to sperm whales include depredation (whales taking fish off fishing lines) and ingestion of marine debris<sup>19</sup>.

# Relative Abundance of Sperm Whale in B.C. Waters





# LESS COMMON TOOTHED WHALES

## Northern Right Whale Dolphin

*Lissodelphis borealis*



**Average Adult Length:** 2-3 m / 7-10 ft

### Description

Slender black body with white belly. Prominent beak with white tip. Only dolphin species in the North Pacific with no dorsal fin. Very small pectoral flippers often held close to the body.

## Risso's Dolphin

*Grampus griseus*



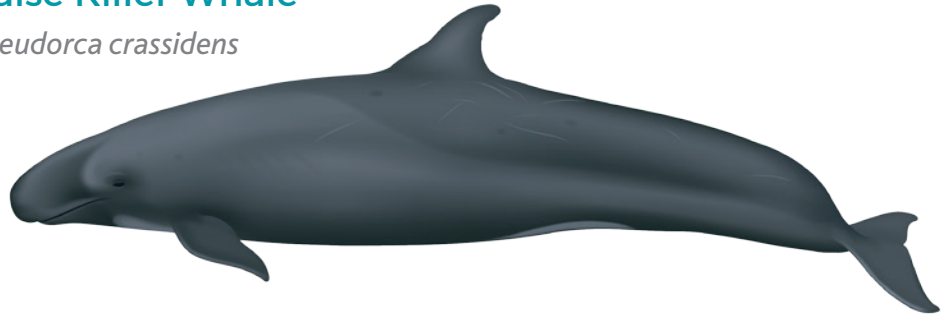
**Average Adult Length:** 4 m / 13 ft

### Description

Grey body, often with conspicuous lighter grey scratches all over. Heavily scarred individuals appear almost white. Dorsal fin is large. Dorsal fin and pectoral flippers are a darker grey than body. Head appears to be blunt with a prominent forehead. No beak visible. Forehead has distinctive furrow down the centre.

## False Killer Whale

*Pseudorca crassidens*



**Average Adult Length:** 5-6 m / 16-20 ft

### Description

Body is completely black with no white or grey markings. Dorsal fin is small and curved. Pectoral fins bulge along front edge. Rounded and prominent forehead.

## Baird's Beaked Whale

*Berardius bairdii*



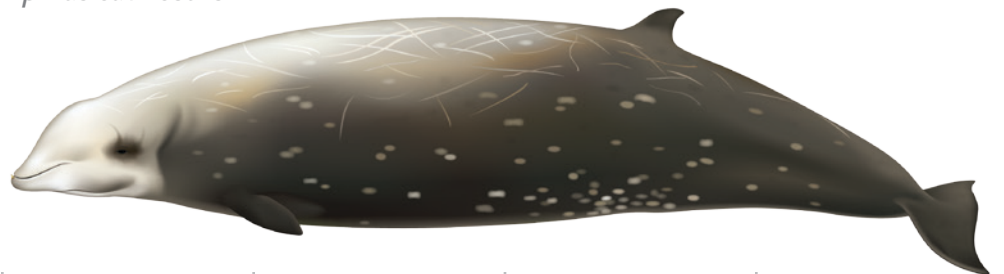
**Average Adult Length:** 10 m / 33 ft

### Description

Brownish-grey back with irregular white patches on the belly. Adults may show linear scarring. Dorsal fin is slightly rounded and short, located 2/3 of the way down body. Adults have protruding teeth visible on the front of their lower jaw, which extends beyond the upper jaw. Long, prominent beak with a bulging forehead.

## Cuvier's Beaked Whale

*Ziphius cavirostris*



**Average Adult Length:** 5-6 m / 16-20 ft

### Description

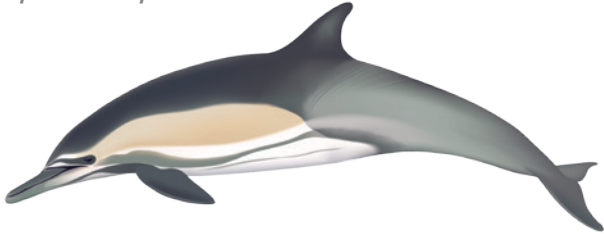
Rusty brown to slate grey back with white head. Small white circular scars and heavy linear scarring may be evident. Dorsal fin is small, curved, and located 2/3 down body. Adult males may have visible protruding teeth on front of their lower jaw, which extends beyond upper jaw. Stubby head.

Other very rare species may occur off the coast of B.C. infrequently. If you feel that you have spotted one of these rare species, please take photos and alert the B.C. Cetacean Sightings Network as soon as possible at [sightings@vanaqua.org](mailto:sightings@vanaqua.org) or 1.866.I.SAW.ONE (1.866.472.9663).

## RARE SPECIES

### LONG-BEAKED COMMON DOLPHIN

*Delphinus capensis*



Average Adult Length: 2 m / 6.5 ft

### SHORT-BEAKED COMMON DOLPHIN

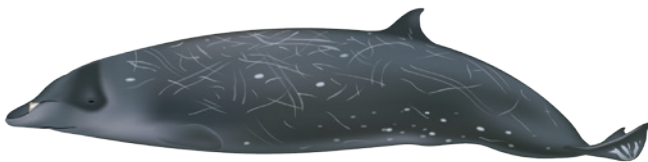
*Delphinus delphi*



Average Adult Length: 2 m / 6.5 ft

### STEJNEGER'S BEAKED WHALE

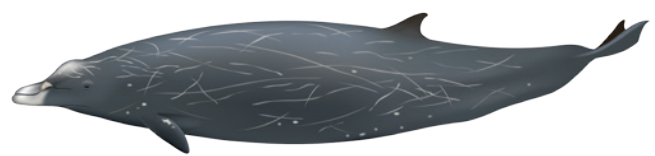
*Mesoplodon stejnegeri*



Average Adult Length: 5.5 m / 18 ft

### HUBB'S BEAKED WHALE

*Mesoplodon carlhubbsi*



Average Adult Length: 5 m / 16 ft

### SHORT-FINNED PILOT WHALE

*Globicephalus macrorhynchus*



Average Adult Length: 5.5-7 m / 18-23 ft

### DWARF SPERM WHALE

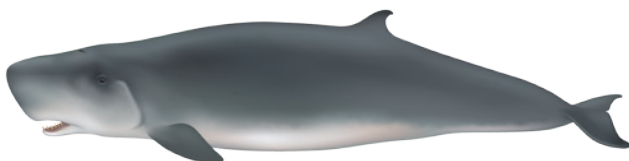
*Kogia sima*



Average Adult Length: 2.5 m / 8 ft

### PYGMY SPERM WHALE

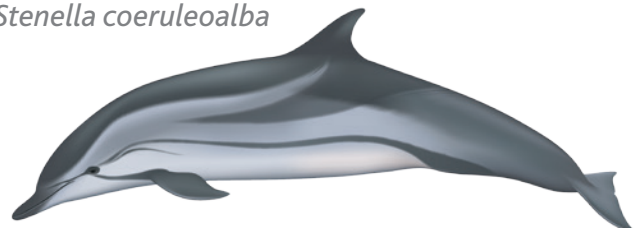
*Kogia breviceps*



Average Adult Length: 3.5 m / 11 ft

### STRIPED DOLPHIN

*Stenella coeruleoalba*



Average Adult Length: 2.5 m / 8 ft



# Turtles

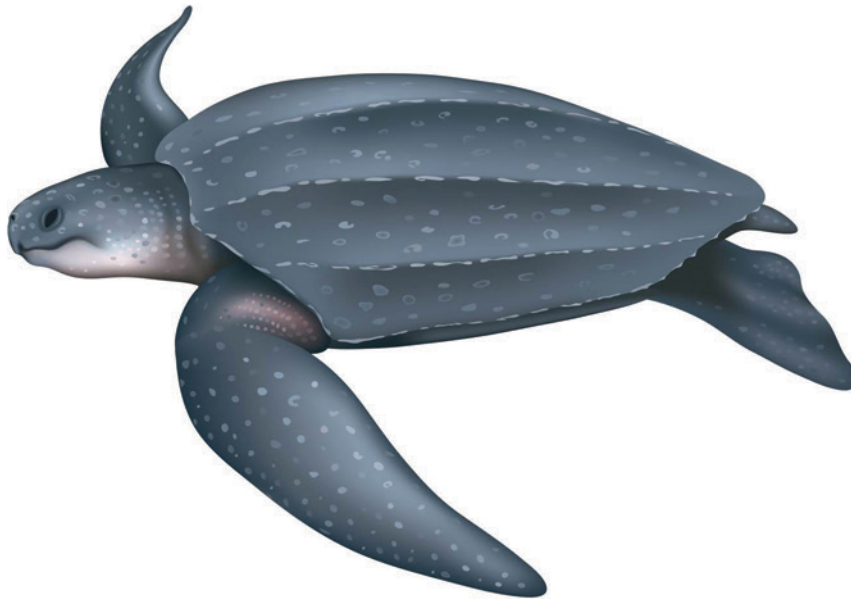


© Scott Eckert



# LEATHERBACK SEA TURTLE

*Dermochelys coriacea*



**Average Adult Length:** 3 m / 9 ft

## SARA Status 2012

Not at Risk (NR)	Special Concern (SC)	Threatened (TH)	<b>Endangered (EN)</b>	Extirpated (EX)
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### Appearance

Body is dark grey to black and may be covered with many white spots. No hard shell is present, instead shell is leathery. Prominent ridges run down the back (looks similar to the underside of a boat). Body is tear-shaped and tapers to a point at the rear. A pink-orange spot may be visible on the back of the head. Often only the head and front 1/3 of the back are seen when surfacing.

### Behaviour

Solitary. Surfaces to breathe for a few minutes after undertaking a long dive. Holds head above the water, then slowly sinks back down.

### Distribution

Make extensive feeding migrations to the waters off B.C. from nesting beaches in tropical regions in Southeast Asia and the South Pacific. Most frequently seen off B.C.'s coast in offshore and coastal waters between July and September, but may be spotted year-round. Often observed in the same areas where *Mola mola* (sunfish), sharks, or large numbers of jellies are seen.

### Vulnerability of the Species

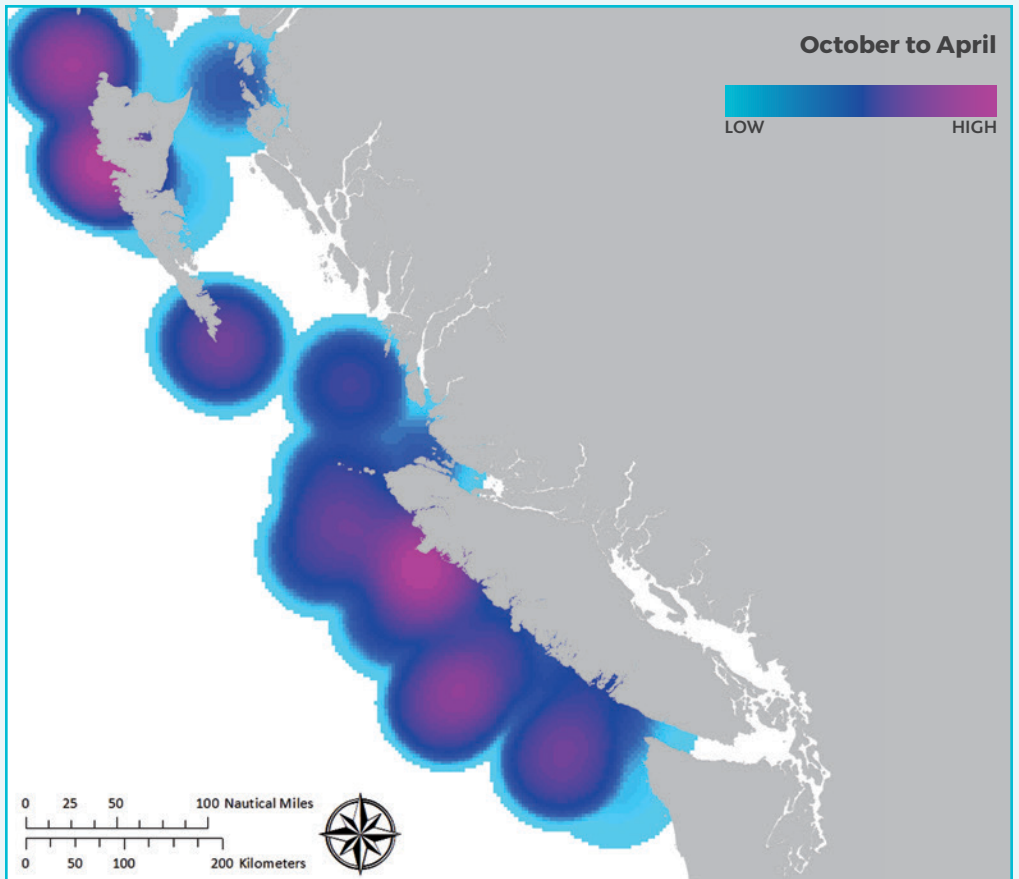
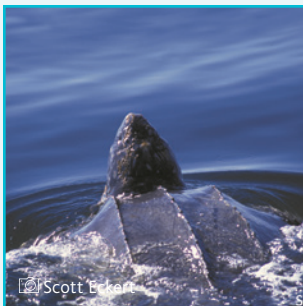
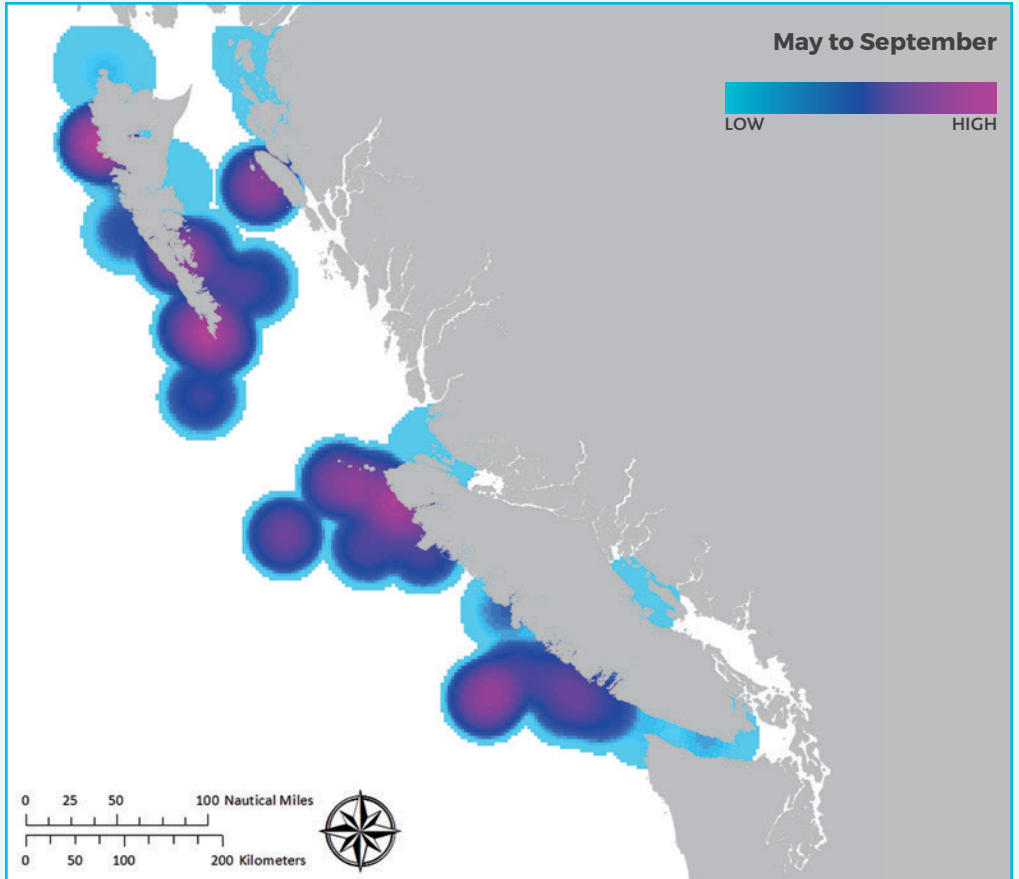
The endangered status of leatherback sea turtles make vessel strikes a particular concern, as mortality of even a few individuals can have a significant impact on their population status.

Leatherback sea turtles are a slow moving species, and spend a significant amount of time at or just below the surface when feeding and travelling, making them particularly vulnerable to vessel strikes<sup>7</sup>.

Further threats to leatherback sea turtles include accidental capture, entanglement, ingestion of debris, diseases and parasites, predation, oil exploration and extraction, contamination, and aquaculture.

**NOTE:** While not a cetacean, leatherback sea turtles are included in this guide as they are a species found off the coast of B.C. that is vulnerable to vessel impacts. Any sightings of leatherback sea turtles (alive or dead) are very valuable to scientists, and should be reported immediately (see page 16).

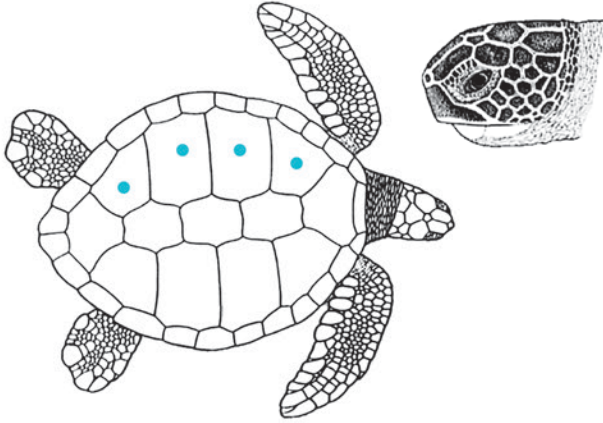
# Relative Abundance of Leatherback Sea Turtles in B.C. Waters



# RARE SEA TURTLE SPECIES

## GREEN SEA TURTLE

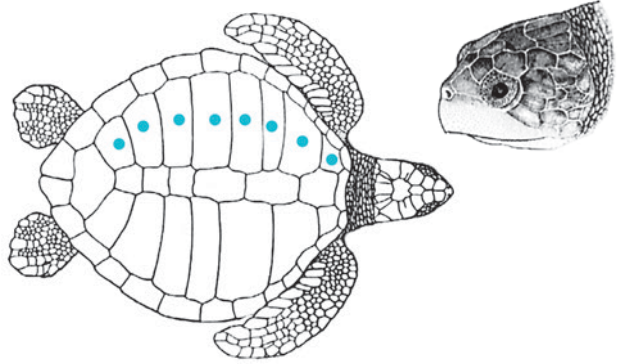
*Chelonia mydas*



**Average Adult Length:** 1.5 m / 5 ft

## OLIVE RIDLEY SEA TURTLE

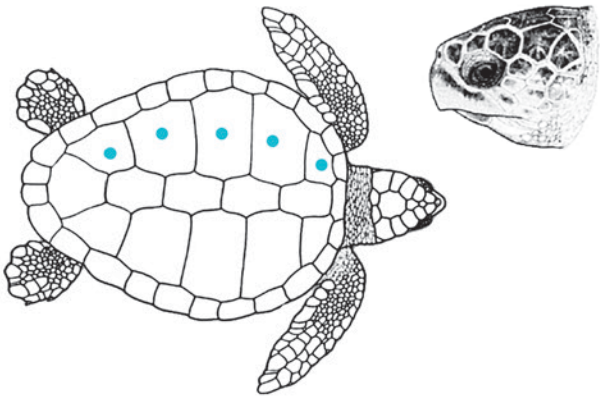
*Lepidochelys olivacea*



**Average Adult Length:** 1 m / 3 ft

## LOGGERHEAD SEA TURTLE

*Caretta caretta*



**Average Adult Length:** 1.2 m / 4 ft

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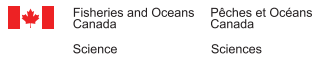


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