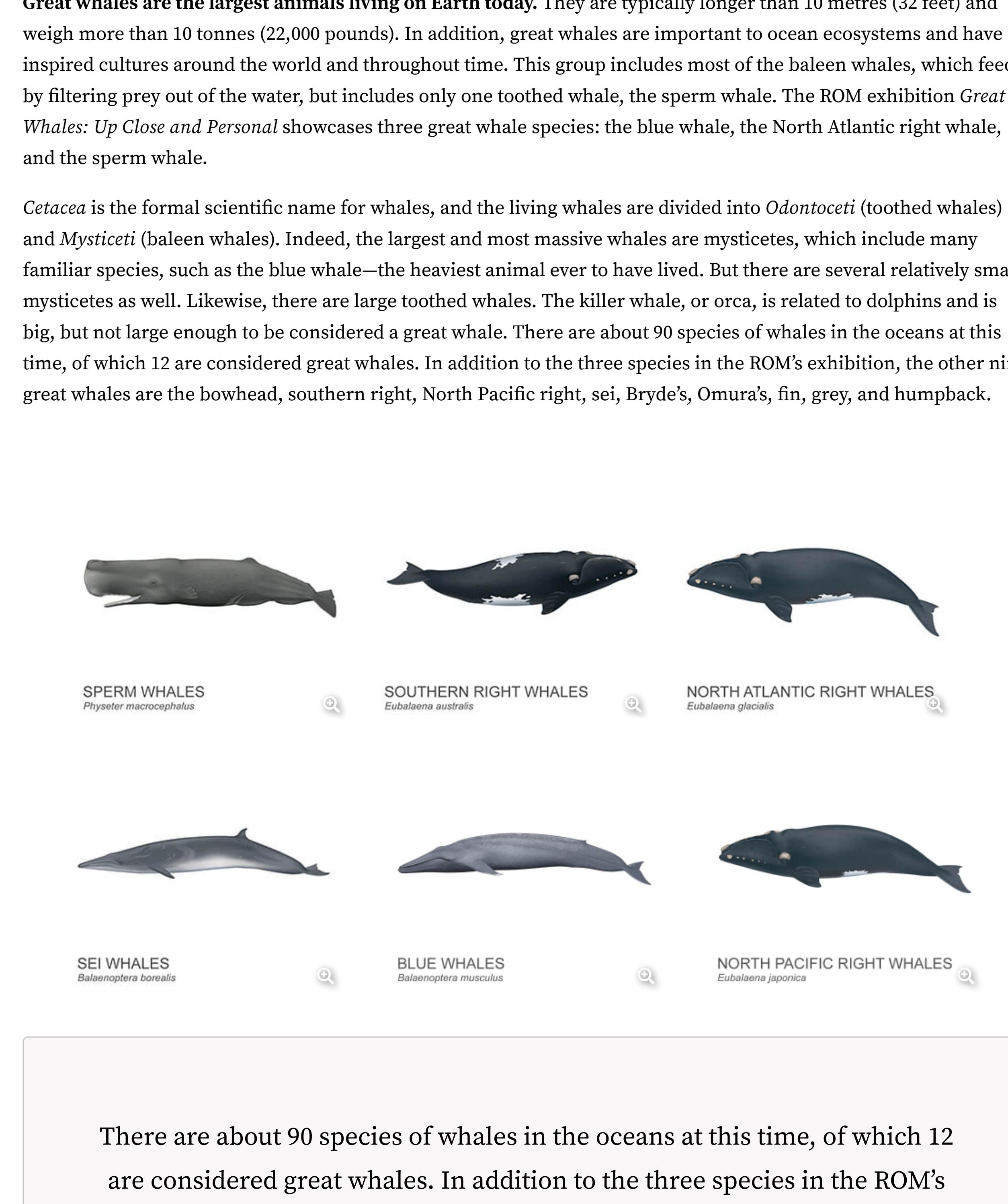


## Great Whales

Up close and personal

BY ROYAL ONTARIO MUSEUM

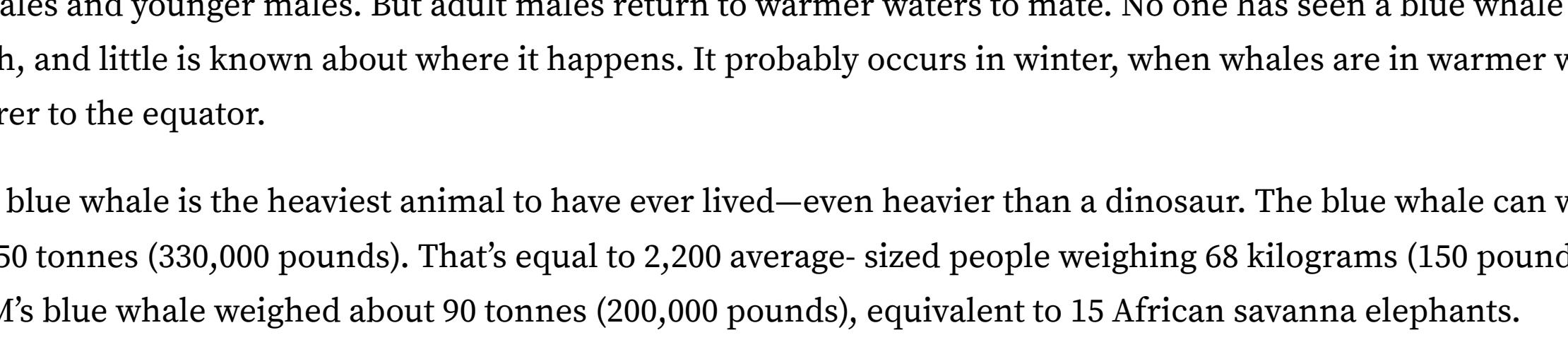
June 11, 2021



Mist from the blow of a blue whale still visible after it surfaced.

**Great whales are the largest animals living on Earth today.** They are typically longer than 10 metres (32 feet) and weigh more than 10 tonnes (22,000 pounds). In addition, great whales are important to ocean ecosystems and have inspired cultures around the world and throughout time. This group includes most of the baleen whales, which feed by filtering prey out of the water, but includes only one toothed whale, the sperm whale. The ROM exhibition *Great Whales: Up Close and Personal* showcases three great whale species: the blue whale, the North Atlantic right whale, and the sperm whale.

*Cetacea* is the formal scientific name for whales, and the living whales are divided into *Odontoceti* (toothed whales) and *Mysticeti* (baleen whales). Indeed, the largest and most massive whales are mysticetes, which include many familiar species, such as the blue whale—the heaviest animal ever to have lived. But there are several relatively small mysticetes as well. Likewise, there are large toothed whales. The killer whale, or orca, is related to dolphins and is big, but not large enough to be considered a great whale. There are about 90 species of whales in the oceans at this time, of which 12 are considered great whales. In addition to the three species in the ROM's exhibition, the other nine great whales are the bowhead, southern right, North Pacific right, sei, Bryde's, Omura's, fin, grey, and humpback.



SPERM WHALES *Physeter macrocephalus*

SOUTHERN RIGHT WHALES *Eubalaena australis*

NORTH ATLANTIC RIGHT WHALES *Eubalaena glacialis*



SEI WHALES *Balaenoptera borealis*

BLUE WHALES *Balaenoptera musculus*

NORTH PACIFIC RIGHT WHALES *Eubalaena japonica*



OMURA'S WHALES *Balaenoptera omurai*

BOWHEAD WHALES *Balaena mysticetus*

HUMPBACK WHALES *Megaptera novaeangliae*



BRYDE'S WHALES *Balaenoptera edeni*

GREY WHALES *Eschrichtius robustus*

FIN WHALES *Balaenoptera physalus*

## Canada's great whales

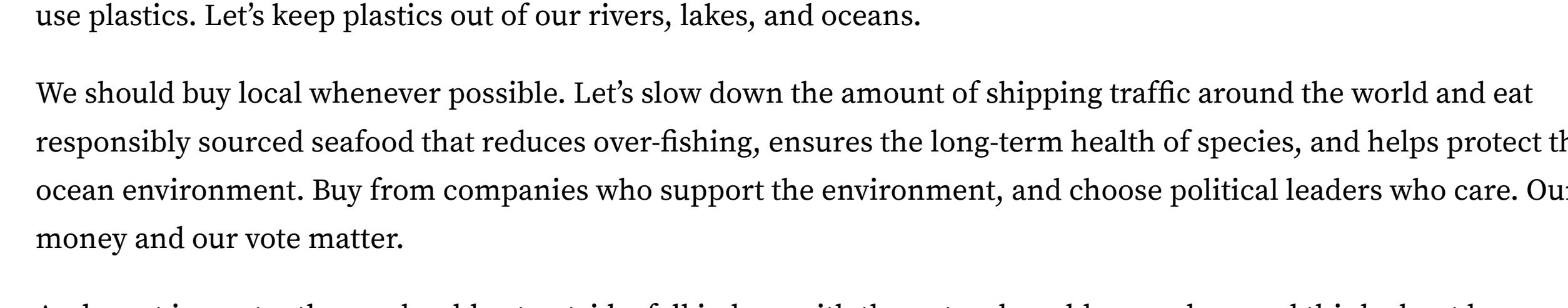
Great whales swim in the expansive waters of all the oceans around the globe including the Gulf of St. Lawrence, one of the most productive marine environments in the world. In addition to fresh water from the Great Lakes, it receives the cold Labrador Current from the Arctic and the warm Gulf Stream from the Tropics. This milieu supports a wealth of marine organisms ranging from microscopic plankton to great whales. But the Gulf of St. Lawrence is also a major international shipping corridor and commercial fishing area that is a primary economic driver for Atlantic Canada.

The waters off Canada's east coast are a prime feeding zone for predators and prey. Blue whales feast on swarms of krill, small shrimp-like crustaceans, in the Gulf of St. Lawrence beginning in the early spring. Until a few years ago, North Atlantic right whales were common in the Bay of Fundy. However, recent climate-driven changes have altered the distribution of copepods, tiny crustaceans that are their main food. This has affected the distribution of North Atlantic right whales. They have begun showing up in the Gulf of St. Lawrence, where they were not typically found before, resulting in more ship collisions and entanglements in fishing gear. Sperm whales hunt for squid in the deeper waters farther out in the Northwest Atlantic.

Much remains unknown about where great whales mate and give birth. North Atlantic right whales mate during summer in northern waters, and females migrate south for the winter to give birth off the coast of the southeastern United States. Adult male sperm whales tend to migrate farther toward cooler, higher latitudes during summer than females and younger males. But adult males return to warmer waters to mate. No one has seen a blue whale give birth, and little is known about where it happens. It probably occurs in winter, when whales are in warmer waters nearer to the equator.

The blue whale is the heaviest animal to have ever lived—even heavier than a dinosaur. The blue whale can weigh up to 150 tonnes (330,000 pounds). That's equal to 2,200 average-sized people weighing 68 kilograms (150 pounds). The ROM's blue whale weighed about 90 tonnes (200,000 pounds), equivalent to 15 African savanna elephants.

But the tallest animal ever was a giant sauropod that roamed North America about 110 million years ago called *Sauroposeidon*, which measured 18 metres (59 feet) high. Blue whales are about 5 metres (16 feet) from belly to blowhole. Blue whales can reach about 33 metres (108 feet) in length, with females usually longer than males.



Blue whale. © Philip Colla / Oceanlight.com.

## How did great whales get so big?

Whales have been able to reach such great sizes partly because they are adapted to life in the sea and live entirely in water, which supports their great mass and reduces the effects of gravity. Land animals can be only as heavy as their legs can support, and legs can get only so big and still be functional. Whales are buoyed in the ocean, and their size is not as constrained as that of terrestrial animals.

The large size is also attributable to the fact that heat radiates much more rapidly in water than in air. As bodies increase in size, volume increases more quickly than surface area, which means relatively less heat is lost. Whales also have a layer of insulation called blubber, another adaptation that helps them stay warm in cold waters.

The size of most baleen whales requires additional explanation.

Lengths over 10 metres may have been achieved some 15 million years ago, and larger-bodied species became more common about 4.5 million years ago. The size increase was driven also by changes in oceanic conditions associated with the repeated advances and recessions during the more recent Ice Ages. These fluctuations in the marine environment changed ocean currents and led to patchy but highly productive feeding opportunities for baleen whales, which eat plankton and other small organisms such as krill, which occur in large swarms.



Sperm whale. Sergio Hanquet, iStock.

## Whales at risk

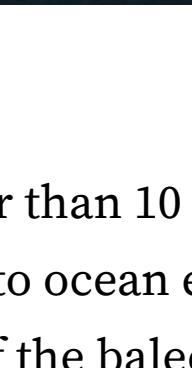
Great whales have been hunted for centuries, first sustainably for food and survival. But as the demand for blubber and baleen increased, so did the whaling. By the end of industrial whaling in the 1980s, the global populations of the largest whales had been reduced by over 95 percent. We have long exploited these giants for commercial and industrial gain. Now, it is up to us to help save them from extinction.

Some of the richest feeding grounds for great whales are found in or near the Gulf of St. Lawrence. Six species are often seen in this extraordinary area, including blue, sperm, and North Atlantic right whales. Today, many whale species are threatened or endangered. In the Northwest Atlantic, whales must avoid ship traffic, escape from fishing lines that entangle them, and overcome challenges caused by human-induced climate change. Our human activity has caused whales great harm, and it is now our responsibility to fix the mistakes and help the whales. Whales can recover if given a chance.

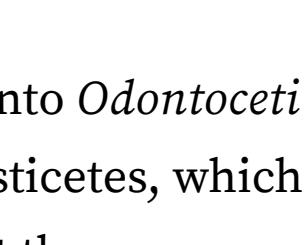
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**Eating Habits**

Baleen whales can take in a huge amount of food in a single gulp. Some, like right and bowhead whales, swim steadily through a swarm of tiny prey.



Toothed whales eat a variety of fish, octopus, cuttlefish, and squid—sperm whales, the largest of the group, even feed on giant squid. Sperm whales use their teeth to grasp large prey, instead of cutting or chewing their meal with sharp teeth.



Blue whales lunge forcefully through a prey swarm to get their fill. They eat about 70 mouthfuls of krill a day! Each gulp can hold about 60 kg (132 lbs.).

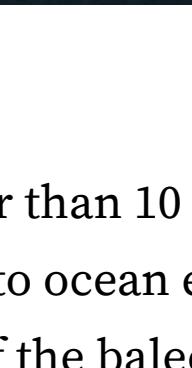


Blue whale. © Philip Colla / Oceanlight.com.

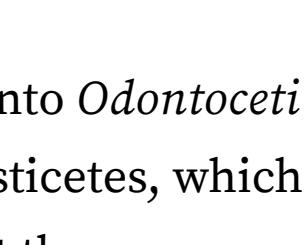
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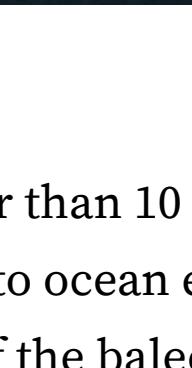


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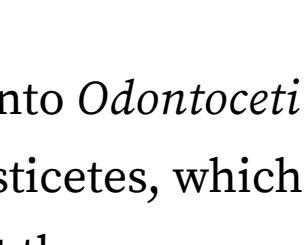
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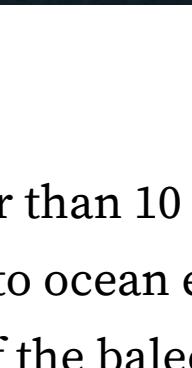


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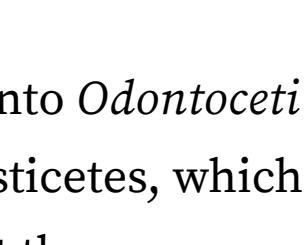
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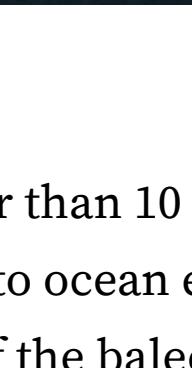


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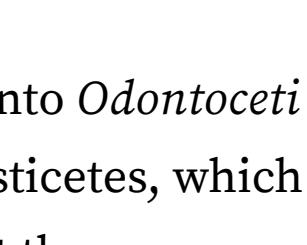
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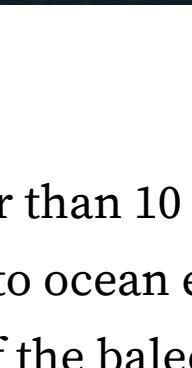


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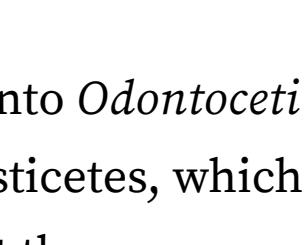
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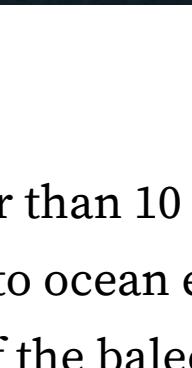


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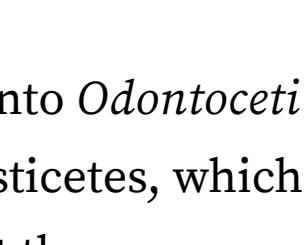
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