



Blue Whale



The **blue whale** (*Balaenoptera musculus*) is the largest animal ever known. It is a member of the group of whales known as rorquals. Rorquals are differentiated from other baleen whales by having dorsal fins and long grooves along the throat. The grooves act like pleats, allowing the throat area to balloon out with water when the whale is feeding. Blue whales have 55-88 of these grooves, some extending from the chin to the navel. Other rorquals are fin, sei, Brydes, minke and humpback whales.

Blue whales are cosmopolitan, found in all the world's oceans. They inhabit both coastal and pelagic environments, and are found most frequently along the edges of continental shelves.

Because blue whales are difficult to find during visual surveys in Alaska, scientists use passive acoustic technology, including hydrophones and Navy-surplus sonobuoys, to classify different types of blue whale vocalizations, or "calls." These calls are unique to two different regions: "northeast" calls are heard in the eastern tropical Pacific through the Gulf of Alaska, and "northwest" calls are heard off Hawaii, Midway Island, the northwest Pacific and Alaska. For management purposes, the National Marine Fisheries Service recognizes two stocks: Eastern and Western North Pacific. Because call types intermix in Alaskan waters, there is some concern these 2 management stocks may not be distinct. Alternatively, the International Whaling Commission recognizes a single North Pacific stock.

General Description: Blue whales from the southern hemisphere can reach 100 feet in length (33 m) and weigh more than 330,000 pounds (150,000 kg). Northern hemisphere animals are usually smaller, reaching 75-80 feet (23-27 m) and weighing 200,000 pounds (90,000 kg). Fully grown females are usually larger than males. Blue whales are blue-gray in color with lighter mottling on the sides and back. The darkness of the color and the amount of mottling can vary between animals. The undersides of the fins are white. They are sometimes called "sulphur-bottom whales" due to a yellowish color possibly caused by growth of microscopic diatoms. The head of a blue whale, when viewed from above, is wide and flat, somewhat like a gothic arch. When breathing, they can spout water 25 to 30 feet in the air. Spouts are slender and last up to 5 seconds. The dorsal fin on a blue whale is small, about one foot high.

Food Habits: Of all the great whales, the blue whale has the most limited diet. It feeds almost exclusively on small, planktonic, shrimp-like krill. The average blue whale needs an estimated 40 million krill per day to meet its energy requirements. In the north Pacific, the krill species *Euphausia pacifica* and *Thysanoessa spinifera* are the main foods of blue whales. These two species occur in dense aggregations near the ocean's surface. A blue whale feeds by gulping huge quantities of water into its large mouth and expandable throat area. The animal then tightens its throat muscles, forcing the water across its baleen plates and out of the mouth. The krill are caught in the filter created by the overlapping fibrous edges of the baleen plates. The krill are wiped off the baleen by the tongue and swallowed. The baleen in a blue whale is black. The animals have 270-395 plates on each side of the upper jaw.

Life History: The age at which female blue whales become mature is unknown but estimated to be 5 to 10 years of age. Upon reaching sexual maturity, females bear a single calf every two to three years. In the northern hemisphere, blue whales calve and mate in late fall and winter. The gestation period is 10-11 months. Calves are about 23 feet long (7.6 m) when born and weigh over 5,000 pounds (2,250 kg). The calves nurse for about six months and gain more than 200 pounds per day. At weaning, calves are approximately 50,000 pounds (22,500 kg) and 50 feet long (15.5 m).

Seasonal movements: Blue whales are thought to move poleward in spring to exploit the high seasonal zooplankton production found in high-latitude waters during summer. In the fall, blue whales move toward the subtropics, where warmer waters are thought to reduce energy expenditures while fasting, provide favorable conditions for reproduction and eliminate the risk of ice entrapment. Whales of the Western North Pacific stock are thought to feed in the Gulf of Alaska, south of the Aleutians and south of Kamchatka, and winter in the western and central Pacific. Whales of the Eastern stock winter off Mexico and Central America and feed during summer primarily along the US continental West Coast and, to a lesser extent, the Gulf of Alaska.

Behavior: Blue whales do not travel in large groups, but solitary or paired whales may occur near each other on productive foraging grounds. Off California, foraging behavior has been observed during daylight and the first half of the night. Dives in daylight are deeper and longer than night dives, tracking the downward movement of their prey during daylight and upward movement in darkness. These whales appear to concentrate their activity in areas likely to have high prey concentration. Blue whales have been observed diving for at least 17.5 minutes, and may have the physical ability to dive at least twice as long. They can swim up to 20 knots.

Population size: Blue whales in the North Pacific are estimated to be at 33% of historic carrying capacity. There is no reliable abundance estimate for blue whales in the Western North Pacific stock that occurs off Alaska. Blue whales in the Eastern stock off the continental US Pacific coast are approximately 1,700 in number and increasing, but this growth likely includes both increased population and whales moving in from other regions.

South of the Eastern Aleutians, large concentrations of blue whales were reported in the 1970s, but there were no well-documented sightings in Alaska during shipboard and aerial surveys in the 1980s and 1990s. Scientists were finally able to document blue whale vocalizations in the Gulf of Alaska in 1999. In 2004, scientists made visual and audio observations and even took a genetics sample from blue whales south of the Aleutian Islands.

Predators, hunting, and other mortality: Whaling depleted worldwide stocks of blue whales before the International Whaling Commission banned commercial harvest of this species in 1966. These fast-swimming whales were only occasionally hunted before the advent of steamships and deck-mounted harpoon cannons in the late 1800s permitted large-scale exploitation. Of approximately 360,000 blue whales harvested between 1910 and 1965, about 9,500 were taken in the North Pacific and 330,000 in the Antarctic. The main summer whaling grounds for North Pacific blue whales were in Alaskan and Russian waters: the eastern Gulf of Alaska, south of the eastern Aleutians, and south of the far western Aleutians out to Kamchatka. Since the whaling ban, few illegal takes have been documented.

In modern times, killer whales have been observed attacking blue whales, and a high proportion of blue whales in California show scarring from attacks, but the extent of mortality due to orcas is unknown. North Pacific blue whales do not yet appear to compete with fisheries for prey, and mortality from fishery entanglement has not been observed since observer programs began in the 1990s. Several ship strikes have killed blue whales off California since 1980.

Blue whales of both Eastern and Western North Pacific stocks are classified as endangered under the Endangered Species Act and depleted/strategic under the Marine Mammal Protection Act.

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