

The Kid's Times:

Volume 11, Issue 8

Sperm Whale



Photo courtesy of IFAW

Females, young of both sexes, and calves live in groups. Older males are solitary.

How did the sperm whale get its name?

Sperm whales are named for the spermaceti oil (wax) that they produce in the spermaceti organs located in their head. The scientific name is *Physeter macrocephalus*. *Macrocephalus* comes from the Greek for "big head."

What do they look like?

Sperm whales are the largest of the **odontocetes**. The large head is the primary feature of a Sperm whale. Up to one-third of the sperm whale's total body length and more than one-third of its mass is composed of its head. The brain of a sperm whale is the largest of any animal (up to 20 lbs.). The skin around the head is smooth like most whales, but wrinkled starting behind the pectoral fins and going back to the tail.

A sperm whale's mouth is also rather unique; small with teeth only on their lower jaw. The upper jaw is dotted with holes where the bottom teeth fit when the mouth is closed.

There are 20-26 pairs of 3-8 inch long, cone-shaped teeth in the narrow lower jaw. The upper and lower lips are white. There are 2-10 short deep grooves on the throat.

Adult males reach 50 feet in length and weigh 120,000 lbs (60 tons). The females grow to more than 36 feet and weigh 55,000 lbs. (27.5 tons). Newborn calves are about 13 feet long and weigh only 2,200 lbs. (1.1 tons).

The sperm whale's blowhole is located near the front of the head and it off to the left side. The blowholes of most whales are toward the middle of the body. The sperm whale blow is unique because it shoots off forward at an angle rather than vertical.

Sperm whales are dark gray. There can be light gray or white markings around their mouth and on their belly. The flippers are short and wide with rounded tips, and the **flukes** are triangular with a straight back edge. The **dorsal fin** is low, thick, and wide. A callous-like area appears on the dorsal fin of 75% of the females and some young males. The area never appears on adult males. Sperm whales have a ridge along their backs with bumps and a thick ridge near the base of the tail (the caudal peduncle).

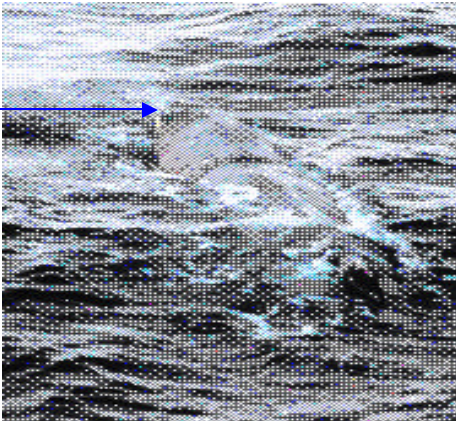
Where do they live?

Sperm whales live in oceans all over the world, except Arctic and Antarctic waters. They pre-

fer deep waters, such as those near under-water canyons, near the edges of banks, and over continental slopes. While they are usually found offshore, they can be found near shore where the shelves are narrow and the water is deep.

Adult male Sperm whales travel the largest distance, moving as far north and south as the edges of the **polar regions** to feed. Females and males of all ages can be found in **temperate** and **tropical** seas and usually stay within an area of approximately 600 miles. In the winter, the females and young males move closer to the equator.

How
long
they
live?



NMFS File Photo

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The blowhole of the Sperm whale is not in the center of the body, but toward the head and off to the left.

Sperm whales live at least 60-70 years.

What do they eat?

A Sperm whale's diet consists mostly of prey found on or near the ocean bottom. Large and medium-sized squid are the primary food for Sperm whales, but they also eat octopi, demersal rays, sharks, and various bony fish. Unlike other large whales that feed only in certain places and in certain times of the year, the Sperm whale feeds all the time, eating about three percent of its body

weight each day. For a large male, this could mean almost two tons of food each day!

How do they behave?

Sperm whales form "nursery schools" that contain between 20 and 30 whales; females, **calves**, and juveniles (male and female). Young males, and possibly some young females, start to leave the groups when they are approximately six years old and begin to form "bachelor schools." These schools contain whales between the ages of 4 and 20. As male Sperm whales grow older, they leave this group also and are solitary for the remainder of their lives, only joining females to mate in the spring and early summer each year.

Sperm whales are one of the deepest diving whales. They usually dive hundreds or thousands of feet for as long as 40 minutes, but can dive a mile or deeper for over two hours! There is little or no light that deep, but sperm whales use **echolocation** to find their food and navigate. During echolocation, they send out high-pitched sounds that bounce off objects and return back to the whale, telling them where the objects are. Between dives, Sperm whales often spend time lying stationary at the ocean's surface. When swimming, the whales can reach 2-3 knots, but may be able to swim up to 12 knots when they are chased.

Sperm whale populations grow very slowly because the whales do not reproduce quickly. They reach maturity at 6 years old for females and 20 years old for males. A **calf** is born to a female Sperm whale only every 4-6 years. After they are born, calves stay with the mother for between 1 and 2 years.

What sounds do sperm whales make and why?

Sperm whales make sounds that are very different from those of **baleen whales**. They have the largest nose in the world, which in fact is very much involved in producing underwater sounds. Being **odontocete cetaceans**, these animals make sounds that are more like dolphins than large whales, despite the fact that sperm whales are closer in size to many of the baleen whales. Most of the sounds that sperm whales make are clicks ranging from less than 100 Hz to 30 kHz (most of the sounds are in the 2 to 4 kHz and 10 to 16 kHz ranges). You could hear most of these sounds, but the highest of them would be above your frequency range of hearing. Still, compared with dolphins and porpoises, the clicks of sperm whales are fairly low in frequency, probably because the animals are so large. Clicks are heard most frequently when the animals are diving and foraging. These sounds may be echolocation ("sonar") sounds used to find their squid prey, calls to coordinate movement between individuals, or both. Clicks are heard most frequently when the animals are in groups; lone sperm whales are generally silent. Scientists think that the clicks may be used to keep groups of whales together as they are feeding in the darkness at great depths. The clicks are produced when air is passed between chambers in the animals' nasal passages, making a sound that is reflected off the front of the skull and focused through the oil-filled nose. It has been suggested that the powerful echolocation clicks made by sperm whales may stun their prey. Recent studies have shown that these sounds are among the loudest sounds made under water by animals (they can travel up to six miles despite being fairly high



NMFS File Photo

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Sperm whales will 'raft' at the surface of the ocean between dives.

frequency). Sperm whales also produce codas, click sequences that are stereotyped (different for each individual – sometimes called "signature codas") and can last for several hours. Codas may reveal if the whales are male or female. Some codas are shared between individuals in a **pod** of sperm whales. These sounds may be used for communication when the animals are at the surface between feeding dives.

You can find sperm whale sounds on the web at:

<http://birds.cornell.edu/brp/SoundsSpermWhale.html> ,

http://www.whalesongs.org/cetacean/sperm_whales/home.html , or

<http://www.cetaceanresearch.com/sounds.html>

(Contributed by Dr. Brandon Southall and Logan Southall)

Who are their predators?

Man hunted the sperm whale for spermaceti, a semi liquid waxy oil in the whale's head, which was used to make candles and light streets and homes through the 19th century. Whalers also collected ambergris, a waxy substance used in perfumes, and tooth ivory, used for carving.

Commercial whaling was prohibited in U.S. waters by 1973 and by 1988 in international waters. From 1947 to 1987, 258,000 Sperm whales were killed in the North Pacific alone! During the years of whaling, many larger breeding-age males were killed. This upset the male-to-female ratio and led to a serious decline in the sperm whale's birth rate.

Even though Sperm whales are no longer commercially hunted, they are still killed accidentally by entanglement in **drift gillnets** and **longlines** used for fishing and by collisions with very large ships (**shipstrikes**).

What is being done to help sperm whales?

Sperm whales are protected in U. S. waters by the Endangered Species Act and the Marine Mammal Protection Act. This means it is illegal to harass or hunt and kill a sperm whale in U.S. waters.

The International Whaling Commission (IWC) also made **factory ship whaling** of sperm whales illegal worldwide in 1979. The western North Pacific stock (group) of Sperm whales is listed as a "Protected Stock" under the IWC.

Glossary:

Baleen whales: Whales with baleen plates instead of teeth

Calf: A young whale

Cetacean: A whale, dolphin, or porpoise

Dorsal fin: The fin on the back of a whale

Drift gillnets: Large fishing nets that float in the ocean and catch a variety of marine animals

Echolocation: The ability of an animal to use the reflection of sounds it has produced to figure out where it is

Factory Ship Whaling: Hunting, killing, and separating the whale into parts on the ship while at sea, allowing whalers to take more whales. Prior to factory ships, dead whales had to be hauled back to port, which meant whalers could not kill as many whales.

Fluke: The end of a whale's tail

Longlines: Fishing lines that trail for miles behind longline fishing boats

Odontecete: Whales with teeth instead of baleen plates

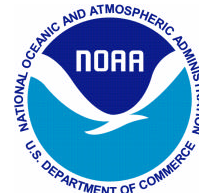
Pod: A group of marine mammals such as whales and dolphins

Polar region: Areas near the north and south poles

Temperate areas: Regions between 1) the

Tropic of Cancer and the Arctic Circle, and 2) the Tropic of Capricorn and the Antarctic

Tropical areas: Regions north and south of the equator from the Tropic of Cancer to the Tropic of Capricorn



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Molly Harrison 2005**