

Marine Mammals

Introduction to Marine Mammals

Mammals are a special group of animals with a combination of characteristics that separate them from all others. They are warm-blooded, have hair or fur, breathe air through lungs, bear live young, and nurse young with milk produced by mammary glands.

Marine mammals are mammals that have, to varying degrees, adapted to living in the ocean. Some, like whales and dolphins, live their entire lives in the water. Others, like sea lions and polar bears, spend considerable amounts of time on land.

To keep warm in the ocean, many marine mammals depend more upon a thick layer of blubber or fat than on thick fur. They have streamlined bodies to help them swim faster. Many can stay under water for a long time, but must come to the surface to breathe. To be able to stay under water for long periods, these animals store extra oxygen in their muscles and blood. They also have more blood than land mammals in proportion to their body sizes, can direct their blood flow to only their vital parts (such as their heart and brain), and can slow their heartbeat down so they use less oxygen in a dive. Many whales and seals are good examples of deep-diving marine mammals with these characteristics.

Other marine mammals rely primarily on thick fur to keep warm in ocean waters. They are less fully adapted to ocean living and are not capable of very deep dives. Polar bears and otters fit into this category.

We gratefully acknowledge the following organizations for much of the information provided here on marine mammals: The Marine Mammal Center and the American Cetacean Society. All information is used with their permission.

Marine Mammal Classifications

Animals classified as marine mammals fall into the following five groups and sub-groups.

Cetaceans (order *Cetacea*)

- ◆ Baleen whales (*mysticetes* suborder)
- ◆ Toothed whales, including dolphins and porpoises (*odondocetes* suborder)

Pinnipeds (order *Carnivora*, Superfamily *Pinnipedia*)

- ◆ True seals (*phocidae* family)
- ◆ Eared seals (*otariidae* family)
- ◆ Walrus (*odobenidae* family)

Mustelids (order *Carnivora*, family *Mustelidae*)

- ◆ Sea otters (*enhydra lutris* species)

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Sirenians (order *Sirenia*)

- ◆ Manatees (*trichechidae* family)
- ◆ Dugongs (*dugongidae* family)

Ursids (order *Carnivora*, family *Ursidae*)

- ◆ Polar bear (*ursus maritimus* species)

A brief discussion of each of the above five categories follows. Note that some of these groups contain species not considered to be marine mammals. For example, the polar bear is the only member of the ursids (bears) that is considered to be a marine mammal. Also, some of these groups include freshwater species. For example, some otters and dolphins are freshwater species. This discussion addresses only marine mammals.

Cetaceans: Whales, Dolphins, and Porpoises

Marine mammals in the cetacean family include whales, dolphins, and porpoises. There are about 90 species of cetaceans, and all but a few species of freshwater dolphins live in the ocean. Millions of years ago, the ancestors of whales lived on land. Scientists believe these land ancestors looked like small dogs, were more closely related to hippos, and went into the ocean about 60 million years ago. Over time, these ancestors changed or adapted, to survive in their new ocean environment. Their front legs turned into paddle-shaped flippers, they lost their back legs, their tails grew larger and widened to form flukes, and they developed a thick layer of fat, called *blubber*, to keep warm in the ocean. Also, their skulls elongated and the nostrils shifted to the back of their heads to aid in breathing at the ocean's surface.

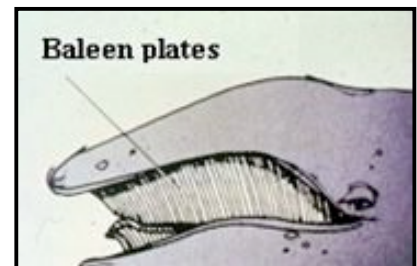
They developed a series of adaptations related to diving. For example, they have more blood volume relative to their body size than land mammals and can store relatively larger amounts of oxygen in their blood (in cells called *hemoglobin*) and in their muscles (in cells called *myoglobin*).

Cetaceans are separated into two groups: baleen and toothed whales.

Baleen Whales (*Mysticetes*)

Mysticetes (literally, “mustached whale”) are the baleen whales. There are about 14 species of baleen whales. Those most likely to occur off of the California coast include gray whales, blue whales, humpback whales, and common minke whales. *Note: Gray whales are described in detail later in this section.*

Baleen whales have two openings in the blowhole, tend to be larger and swim more slowly than toothed whales, and have small or no dorsal fins. Instead of teeth, they have hundreds of rows of baleen plates, like brooms, in their upper jaws. Baleen is made of keratin, a substance in our hair and fingernails. It acts as a filter for catching small fish and floating animals (zooplankton).



Baleen whales are divided into three groups, based on their feeding strategies.

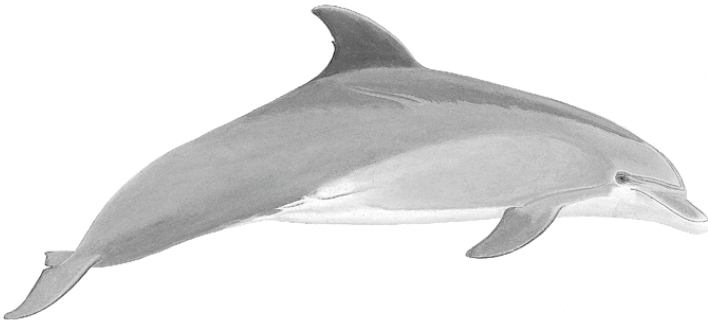
- ◆ The rorquals, such as humpback and blue whales, feed by gulping a large mouthful of food and water and expanding the throat pleats that extend to their navel like a balloon. Then they push the water out through their baleen plates with their tongues, and the food gets trapped behind the baleen.
- ◆ Another type of baleen whale is the skimmer, which includes right and bowhead whales. As they swim, water and zooplankton flow through a gap in the front of their 14-foot-long baleen plates, the food gets trapped inside the baleen, and the water flows out through gaps on the sides of their mouths.

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- ◆ The gray whale has a third, unique feeding strategy. They feed on shrimp-like animals living in the mud in shallow water by turning on their sides and slurping the mud through the side of their mouths.

Despite eating very small animals, baleen whales can be very large. The efficiency of their feeding strategies is what allows them to get so large. They can eat up to four tons of food in one day. Their large size helps to get rid of excess body heat, keeps them from being eaten by most predators, and allows them to fast for months at a time.

The blue whale, which eats tiny krill, is the largest animal on earth. Adult blue whales may be up to 100 feet (30.5 m) long and weigh 150 tons. Most of the large baleen whales are endangered due to past hunting.



Toothed Whales (*Odontocetes*)

Odontocetes are whales that have teeth in their mouths. There are over 70 species of odontocetes, including dolphins and porpoises. Those most likely to occur off of the California coast include orcas (killer whales), sperm whales, Dall's porpoises, harbor porpoises, Pacific white-sided dolphins, bottlenose dolphins (pictured), common dolphins, and Risso's dolphins.

Note: Bottlenose dolphins and Pacific white-sided dolphins are described in detail later in this section.

Toothed whales are different from baleen whales in several ways. Besides having teeth, they have only one opening at their blowhole, tend to swim faster, and usually have a dorsal fin. Most toothed whales are smaller than baleen whales, but range in size from the 5-foot vaquita (a type of porpoise) to the 60-foot sperm whale. Toothed whales also tend to be more social than baleen whales, often living and hunting in groups.

Like bats, toothed whales use echolocation or sonar to detect objects in their environment, such as their prey. They produce sounds that are directed through a fatty organ, called a *melon*, on the front of their head. The sounds bounce off solid objects and return to the animal through their hollow lower jaw (like an echo), so the animals are able to get a “picture” of what is around them.

Most species of toothed whales also use sound to communicate with each other. Many species, such as the sperm whale, seem to have individually identifiable calls. Orcas or killer whales (part of the dolphin family) live in groups or pods, and some pods have a dialect or accent, just like we have accents depending upon which part of the world we are from. In general, dolphins and porpoises tend to be the most social animals among the marine mammals. Sometimes thousands of individuals are seen together.

While most toothed whales have a mouth full of teeth, there are some unusual exceptions. Sperm whales only have teeth in the narrow lower jaw, and strap-toothed whales have only two lower teeth, which wrap around the top of their jaws so they cannot fully open their mouths. The two teeth of many species of beaked whales may only erupt in males, so there are actually toothed whales with no functional teeth at all. Scientists are still trying to figure out how these whales catch and eat their prey. Some think they use a sonic boom to stun their prey, then use suction to eat them whole.

Dolphins and porpoises differ in the type of teeth they have. Dolphins have sharp conical teeth, while porpoises have teeth that are spade- or shovel-shaped. In fact, scientists generally use tooth shape as a way of classifying an animal as a dolphin or a porpoise. Dolphins generally tend to have a pointy mouth or “beak” and a curved dorsal fin, but there are exceptions.

There is much more to discover about the odontocetes. For example, beaked whales spend most of their time in the deep water, far from shore, and so are rarely encountered. Even now, new species are still being discovered.

Pinnipeds: Seals, Sea Lions, and Walruses

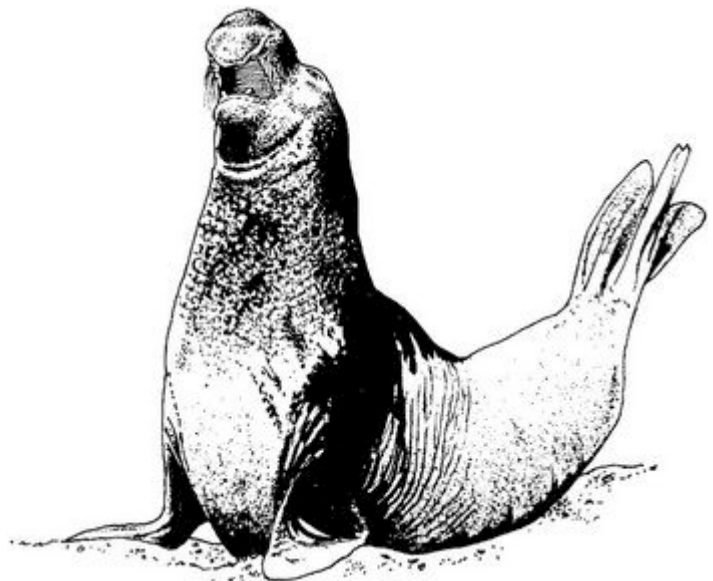
The word *pinniped* means fin-footed or wing-footed, and refers to marine mammals that have front and hind flippers. These include seals, sea lions, and walruses. Most of these animals live in the ocean but are able to come on land for long periods of time. Millions of years ago, the ancestors of pinnipeds lived on land. These were probably weasel- or bear-like animals that spent more and more time in the ocean, and eventually adapted to the marine environment.

There are three families of pinnipeds: phocids, otariids, and odobenids. Each of these groups is discussed in more detail below.

True Seals (*phocids*)

Phocids are referred to as *true seals*. There are about 18 species of true seals; they are the most diverse and widespread of the pinnipeds. These seals live in the oceans of both hemispheres and are mostly confined to polar, sub-polar, and temperate climates, with the exception of the more tropical monk seal. Off of the coast of California, the two species most likely to be seen are northern elephant seals and harbor seals. *Note: These two species are described in detail later in this section.*

True seals swim with efficient, undulating, whole-body up and down movements



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propelled by their strong rear flippers. The efficiency of their swimming and an array of other physiological adaptations make them well suited for deep and long diving and long-distance migrations.

True seals are most easily distinguished from other pinnipeds, such as sea lions and fur seals, by looking at their ears and flippers. True seals have ear holes, but no external ear flaps (*pinna*). Hence, they are sometimes referred to as “earless seals.” They also have relatively small flippers. True seals cannot rotate their rear flippers to the front for use in moving around on land; sea lions and fur seals can do this. So, a true seal moves about on land somewhat awkwardly, by flopping its body along the ground. This means that they cannot walk or climb on land, thus severely limiting where they can go when out of the water.

Other distinguishing characteristics include the fact that true seals have fur out to the end of their flippers. Sea lions (and fur seals) have bare flippers from about halfway out and to the tips. Also, true seals have nails on the end of flippers. Sea lions (and fur seals) do not have nails on the tips but rather mid-way on the flippers.

Many true seals share the exceptional diving abilities described earlier for whales. That is, they have more blood volume relative to their body size than land mammals and can store relatively larger amounts of oxygen in their blood (in cells called *hemoglobin*) and in their muscles (in cells called *myoglobin*). In fact, several species of phocids are among the deepest divers in the ocean and are capable of holding their breath for amazingly long periods of time (e.g., more than an hour).

Sea Lions and Fur Seals (*otariids*)



Sea lions and fur seals are also referred to as *eared seals*, because their ears include the external flap called *pinna*; this is lacking in the phocids or true seals discussed above. Today, there are about seven species of sea lions and about ten species of fur seals. Sea lions and fur seals were once separated into distinct subfamilies, but that separation has more recently been abandoned, and collectively they make up the otariidae family. Some features where the two groups differ are that sea lions tend to have coarse, short fur, greater bulk, and larger prey than fur seals. Fur seals have longer flippers and thicker coats than sea lions.

To a somewhat lesser extent, sea lions and fur seals share the deep-diving abilities of whales and true seals discussed earlier. Some species can dive as deep as 1000 feet and hold their breath for as long as 20 minutes.

Otariids are found around the globe, from subarctic to tropical ocean waters, but are notably absent from the Atlantic Ocean. They have relatively large front and back flippers; on land, they

are able to bring all four flippers underneath their bodies and walk on them. In the water, they swim using their front flippers like oars.

Sea lions tend to be playful and social. They are sometimes seen surfing on breaking waves. Some species of sea lions are readily trainable and are often a popular attraction at zoos and aquariums. The typical “circus seal” trained to play with balls, jump through hoops, etc. is almost always a sea lion. The U.S. Navy has trained sea lions to perform underwater acts, such as detaining a scuba diver.

California sea lions are common along the California coast. Stellar sea lions and northern fur seals also occur along our coast. *Note: These three species are described in detail later in this section.*

Walrus (*odobenids*)

The walrus is the only living species in the odobenidae family. It is found in discontinuous arctic and sub-arctic regions of the northern hemisphere, in and above both the Pacific and Atlantic Oceans.

The walrus is immediately recognized by its prominent tusks (which can be up to one meter long), whiskers, and great bulk. Adult Pacific males can weigh up to 4,500 pounds and, among pinnipeds, are exceeded in size only by the two species of elephant seals. It resides primarily in shallow oceanic shelf habitat, spending a significant proportion of its life on sea ice in pursuit of its preferred diet of benthic bivalve mollusks. It has a relatively long life of about 50 years, is a rather social animal, and is considered a keystone species in Arctic marine ecosystems.

This family of pinnipeds has a combination of the traits found in seals and sea lions. Like true seals, they have no external ears, but like sea lions and fur seals, they can rotate their hind flippers forward. Their swimming technique is more like that of true seals, relying less on flippers and more on sinuous whole body movements. Both males and females have tusks and vacuum-like mouths for sucking up shellfish from the ocean floor. Males have air sacs in their neck that they can inflate to allow them to float as if they were wearing life preservers. Walrus have a bell-like call.

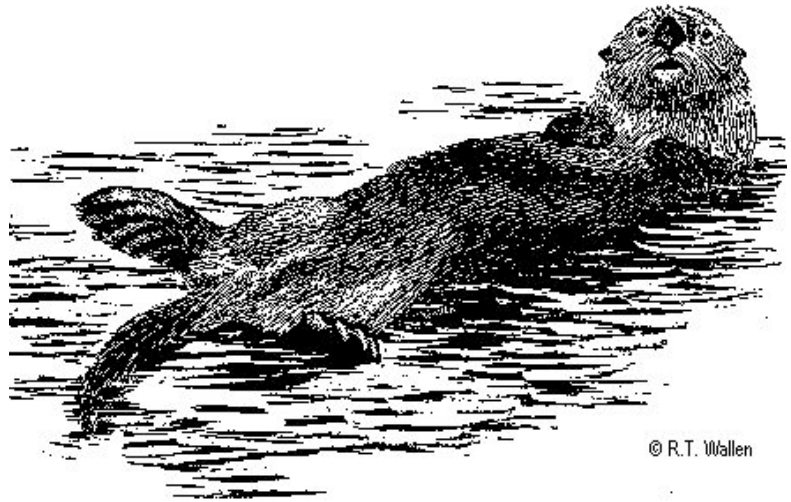
Mustelids: Sea Otters

Mustelids (from the Latin word for weasel) make up a very large and diverse family. There are about 55 species in the family and members of this family occur worldwide. It is often simply referred to as the weasel family. All of its members are carnivorous, although some will also eat vegetable matter. Its members cover a wide range of sizes and behaviors. The smallest member of this family, the least weasel, is not much bigger than a mouse; its largest member, the giant river otter, can weigh up to 80 pounds.

Several mustelids are known for their thick, rich fur (e.g., mink, sable, ermine) and have thus historically been valued for that fur. Mustelids vary widely in the degree of their aquatic capabilities – from none at all to the highly aquatic sea otter.

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Sea otters are the only marine member of the mustelid family, and sea otters are the smallest marine mammal. They do not inhabit the open ocean; instead they live among coastal kelp beds, where they dive and hunt for a variety of shellfish and marine invertebrates. With their exceptionally thick, dark fur, longer tail, lack of true flippers, and their ability to use a rock as a feeding tool, sea otters are easily distinguished from other marine mammals.



Currently, sea otters can be found in separated, small portions of their original range – namely in parts of California, Washington, Alaska, Canada, and Russia. Sea otters can be seen along the central California coast. *Note: This species is described in detail later in this section.*

Sirenians: Manatees and Dugongs

There are three living species of manatees and one surviving species of dugong. All four species are endangered. Sirenians are also sometimes referred to as *sea cows*. The largest among them can reach a weight of 3300 pounds and length of more than 12 feet. They are fully aquatic, herbivorous mammals that inhabit warm or tropical waters in rivers, estuaries, coastal marine waters, swamps, and marine wetlands. The order Sirenia evolved more than 50 million years ago. Elephants are thought to be the closest living relative to the sirenians. In the U.S., manatees are found in areas of coastal Florida. Another species of sirenian, called the Steller sea cow, once inhabited Arctic waters, but was hunted to extinction in the late 1700's, within a few decades of its discovery.

The three existing species of manatees, the West Indian manatee, the West African manatee, and the Amazonian manatee, are found in the rivers and coastal areas of the Atlantic Ocean basin; the one existing dugong species is found in the coastal marine areas of the Indian and Pacific Ocean basins. The now extinct Steller's sea cow was found in very cold coastal waters in the northern Pacific Ocean.

There are no members of the sirenians found along coastal California.

Ursids: Polar Bears

There are about eight living species of bears. Most are carnivorous, some omnivorous. Their closest living relatives are considered to be the pinnipeds. The various bear species are found on the continents of North America, South America, Europe, and Asia.

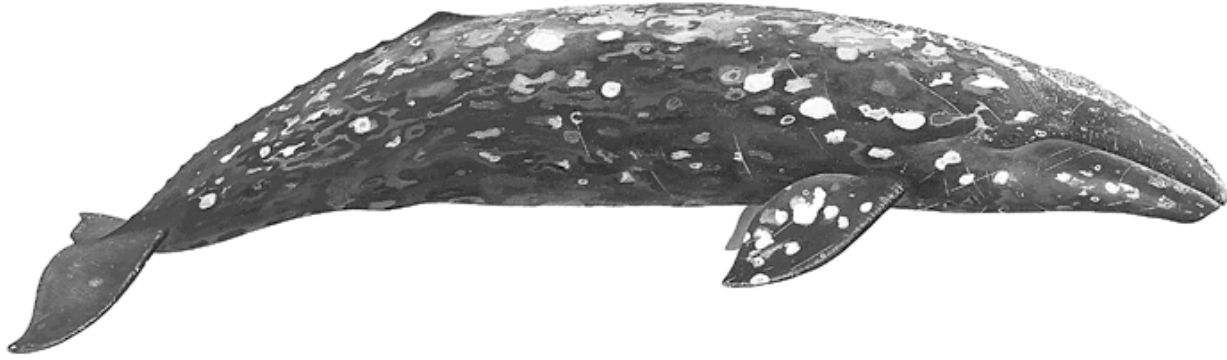
The polar bear is the only member of the ursids (bears) that is considered to be a marine mammal. The polar bear is thought to have diverged from the brown bear about 200,000 years ago. Polar bears are designated as marine mammals because they depend on the ocean for a majority of their food. A polar bear's diet consists primarily of seals. It spends most of its time at sea, hunting mostly from maritime ice. An adult male can weigh up to 1500 pounds. Polar bears are excellent swimmers and have been reported in waters as far as 200 miles from land. They swim dog-paddle fashion, propelling themselves with their large front paws.

Polar bears are well insulated by their thick blubber, their hide, and their dense fur. They are found in discreet communities throughout the Arctic Ocean and adjacent areas.

Specifics on Selected Marine Mammals of Central Coast California

This section contains details and specifics about the following marine mammals:

- ◆ Gray whales
- ◆ Bottlenose dolphins
- ◆ Pacific white-sided dolphins
- ◆ Northern elephant seals
- ◆ Harbor seals
- ◆ Sea otters
- ◆ California sea lions
- ◆ Steller sea lions
- ◆ Northern fur seals



Gray Whales (*Eschrichtius robustus*)

Source: American Cetacean Society website March 2009, used with permission

The gray whale is a coastal whale that migrates along the North American Pacific Coast between Arctic seas and the lagoons of Baja California, Mexico. Frequently visible from shore, gray whales provide a unique opportunity for land and boat observation, and commercial whale watching has become a major industry along its migration route. Visitors to the calving and breeding lagoons in Baja sometimes encounter the phenomenon of the “friendlies,” gray whales that closely approach small boats and allow themselves to be touched by humans.

DESCRIPTION: Gray whales are baleen whales; instead of teeth, they have hundreds of rows of baleen plates like brooms in their upper jaws. Gray whales have a streamlined body with a narrow, tapered head. The upper jaw slightly overlaps the lower jaw. The gray whale received its name from the gray patches and white mottling on its dark skin. On the skin are many scratches, scattered patches of white barnacles, and orange whale lice. Newborn calves are dark gray to black, although some may have distinctive white markings.

Adult males measure about 45 feet long and adult females are slightly longer. Both sexes weigh 30-40 tons. The gray whale has no dorsal (top) fin. About 2/3 of the way back on its body is a prominent dorsal hump followed by a series of 6-12 knuckles along the dorsal ridge that extend to the flukes (tail lobes). Its flippers are paddle shaped and pointed at the tips. Its fluke is about 10-12 feet across, pointed at the tips, and deeply notched.

RANGE/HABITAT: Gray whales inhabit shallow coastal waters of the eastern North Pacific. The gray whale makes one of the longest of all mammalian migrations, averaging 10,000-14,000 miles round trip. In October, the whales begin to leave their feeding grounds in the Bering and Chukchi Seas for their mating and calving lagoons in Baja California, Mexico. The southward journey takes 2-3 months. The whales remain in the lagoons for 2-3 months, allowing the calves to build up a thick layer of blubber to sustain them during the northward migration and keep them warm in the colder waters. The return trip north takes another 2-3 months. Mothers and calves travel very near shore on the northward migration. There are some individual gray whales that are found year round in the Straits of Juan de Fuca between the state of Washington and Vancouver Island, Canada, and some that are seen during the summer months off the northern California coast.

BEHAVIOR: Gray whales feed on small crustaceans, such as amphipods and tube worms, found in bottom sediments. They feed primarily during the summer months of long daylight hours in the cold Arctic waters of the Bering and Chukchi Seas.



Amphipod



Photograph from <http://www.californiagraywhalecoalition.org/images/moods007.jpg>

As a baleen whale, it has a series of 130-180 fringed overlapping plates hanging from each side of the upper jaw, where teeth might otherwise be located. These plates consist of a fingernail-like material that frays out into fine hairs on the ends inside the mouth next to the tongue. The plates are off-white and about 2-10 inches in length. To feed, a whale dives to the bottom, rolls on its side and draws bottom sediments and water into its mouth. As it closes its mouth, water and sediments are expelled through the baleen plates, which trap the food on the inside near the tongue to be swallowed.

A migrating gray whale has a predictable breathing pattern, generally blowing 3-5 times in 15-30 second intervals before raising its fluke and submerging for 3-5 minutes. A gray whale can stay submerged up to 15 minutes and travel at 3-6 miles per hour. Mothers are very protective of their calves; they earned the name “Devilfish” from early whalers in the lagoons because of their violent defensive behaviors. Orcas (killer whales) are a cause of gray whale deaths, and many gray whales have orca teeth scars on their flukes.

MATING AND BREEDING: Gray whales reach sexual maturity at 5-11 years of age, or when they reach 36-39 feet in length. Gestation is 12-13 months. The calf weighs 1100-1500 pounds and is about 15 feet at birth. Calves nurse 7-8 months on milk that is 53% fat (human milk is less than 4% fat). Females bear a single calf at intervals of 2 or more years. Courtship and mating behavior are complex, and frequently involve three or more whales of mixed sexes. Mating and calving both occur primarily in the lagoons of Baja California, Mexico, although both have been observed during migration.

STATUS: At one time there were three gray whale populations: a north Atlantic population, now extinct, possibly the victims of over-hunting; a Korean or western North Pacific stock now very depleted, also possibly from over-hunting; and the eastern north Pacific population, the largest surviving population. Hunted to the edge of extinction in the 1850’s after the discovery of the calving lagoons, and again in the 1900’s with the introduction of floating factories, the gray whale was given partial protection in 1937 and full protection in 1947 by the International Whaling Commission (IWC). Since that time, the eastern North Pacific gray whale population has made a remarkable recovery and now numbers between 19,000 and 23,000.

Bottlenose Dolphins (*tursiops truncatus*)

Source: *American Cetacean Society website May 2009, used with permission*



Photograph from
<http://stuffmeganlikes.wordpress.com>

The bottlenose dolphin is perhaps one of the most well known cetaceans because of its widespread use in marine parks and research facilities. The bottlenose dolphin may be best known as “Flipper” (as seen in the television series). This is the dolphin most frequently seen along the shores of the United States. This species is very flexible in its behavior.

DESCRIPTION: The bottlenose dolphin usually has a short and stubby beak – hence the name “bottlenose.” There are 18-26 pairs of sharp, conical teeth in each side of the jaw. The color of this dolphin varies considerably, but it is generally light gray to slate gray on the upper part of the body shading to lighter sides and pale, pinkish gray on the belly.

The dorsal fin is high and falcate (curved) and located near the middle of the back. The flukes are broad and curved with a deep median notch. The flippers are of moderate length and pointed. Adult length is from 8-12 feet. Weight may be as much as 1,430 pounds off of Great Britain, though most are much smaller in other parts of the world. Males are significantly larger than females.

RANGE/HABITAT: Bottlenose dolphins are found worldwide in temperate and tropical waters, absent only from 45 degrees poleward in either hemisphere. They are frequently seen in harbors, bays, estuaries, and river mouths. There appear to be two ecotypes: a coastal form and an offshore form. Population density appears to be higher nearshore. In some areas, these dolphins have limited home ranges; in others, they are migratory.

BEHAVIOR: Feeding behaviors are diverse, primarily involving individual prey capture, but sometimes involving coordinated efforts to catch food, feeding in association with human fishing, and chasing fish into mudlands. An adult bottlenose dolphin may consume 15-30 pounds of food each day. Bottlenose dolphins eat a wide variety of food, including primarily fishes, and sometimes squid and crustaceans.

Based on a number of studies of nearshore populations, bottlenose dolphins seem to live in relatively open societies. Mother and calf bonds and some other associations may be strong, but individuals may be seen from day to day with a variety of different associates. Group size is often less than 20 nearshore; offshore groups of several hundred have been seen.

MATING AND BREEDING: Males reach sexual maturity at about 10 years. Females reach sexual maturity at about 5-10 years. The gestation period is 12 months. Calving can take place year-round with peaks in some areas during spring and fall. Calves nurse for over a year (12-18 months), and stay with their mothers for 3-6 years, learning how to catch fish and other important tasks.

STATUS: Bottlenose dolphins are still generally plentiful in numbers, but are near depletion in some areas. They do fall victim to incidental and direct exploitation, accidental capture in a variety of fishing gear, pollution, habitat alteration, and boat collisions. Several large die-offs of bottlenose dolphins have occurred in various locations. In some cases, these die-offs have been attributed to a virus which may be related to elevated levels of PCBs in their tissues.

Pacific White-sided Dolphins (*Lagenorhynchus obliquidens*)

Source: American Cetacean Society website May 2009, used with permission



Photograph from http://www.straitwatch.org/species_at_risk

White-sided dolphins come in two forms: the Atlantic white-sided and the Pacific white-sided. Somewhat similar in appearance, the Atlantic species is larger and more robust than its Pacific

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counterpart. Both species are avid bow-riders and acrobatic jumpers. They are sometimes referred to as “lags” because of the cumbersome scientific name, *lagenorhynchus*.

DESCRIPTION: The Pacific white-sided dolphin has a short, rounded, thick beak containing 23 to 32 small, rounded, slightly curved teeth in each side of the upper and lower jaws. Attractively marked, its back is black and its sides are light gray with thin, white stripes that extend from above the eye along the sides, widening towards the tail. Its belly is white. It has a black beak and lips and a black ring around each eye.

The dorsal fin is tall and sharply hooked, and is located at the center of the back. The leading edge is black and the rear portion is light gray. Its flippers are small and curved and rounded at the tips. Its flukes are notched in the center. These dolphins reach a length of 7 to 8 feet and weigh about 300 pounds.

RANGE/HABITAT: The Pacific white-sided dolphin inhabits temperate, coastal waters in the North Pacific, avoiding both tropical and Arctic waters. Its range extends from Amchitka Island in the Aleutians, to the Gulf of Alaska south along the coast of North America to the tip of Baja California. It is also found off the coast of Asia from the Kuril Islands to Japan. It is abundant in Japanese waters with estimates of 30,000 to 50,000 in that area.

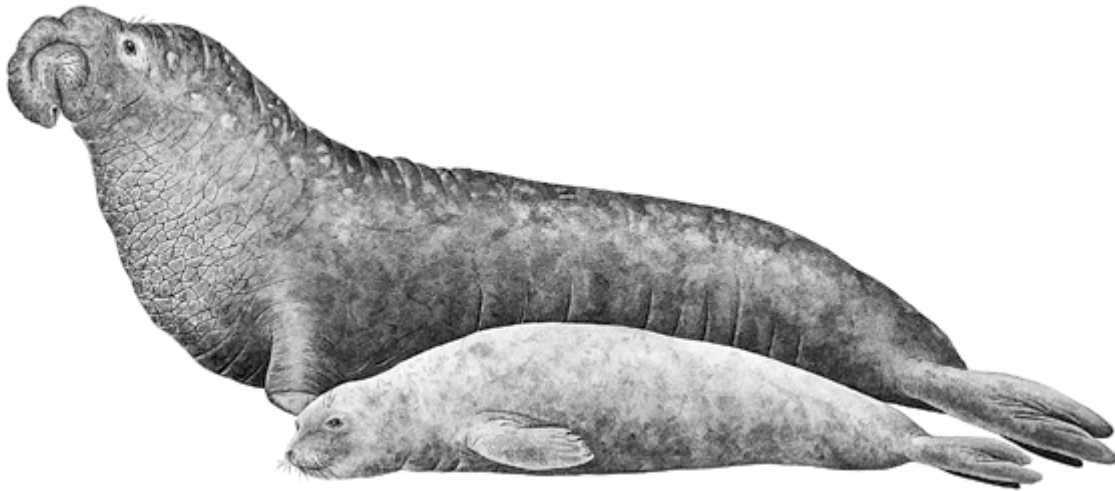
BEHAVIOR: This dolphin is energetic and quite active, and is frequently seen leaping, belly flopping, and somersaulting. It is a strong, fast swimmer and enthusiastic bow rider, often staying with moving vessels for extended periods.

Pacific white-sided dolphins eat squid and small schooling fish such as anchovies, herring, sardines, and hake. It is believed they feed largely at night.

These dolphins are often found in large herds of 90 to 100. The herds are made up of animals of both sexes and all ages. Since they share the same range, they are most commonly seen with northern right-whale dolphins and are often seen accompanying other dolphins and large whales. They are considered residents in some parts of their range, notably Monterey Bay and off southern California and northwestern Baja California. These resident populations are joined by transient groups from other areas from fall to spring.

MATING AND BREEDING: Sexual maturity for both sexes is reached when they are 6 feet in length, but this can vary according to geographical location. Length at birth is about 3 feet. Gestation period is estimated to be 9 to 12 months.

STATUS: This species is no longer commercially hunted in the United States. Some are taken for food in Japan’s coastal fishery. They are difficult to catch, however, and the numbers taken are not a threat to the total population in Japanese waters. A few have been captured for display in aquariums, and unknown numbers have been accidentally killed in drift and gill nets. Population figures are unknown.



Northern Elephant Seals (*mirounga angustirostris*)

Source: The Marine Mammal Center website March 2009, used with permission

Meaning of scientific name: *Having a narrower snout than the southern elephant seal.*

DESCRIPTION: Elephant seals are well named, because their large noses resemble an elephant's trunk. Males begin developing this enlarged nose, or proboscis, at sexual maturity (about three to five years), and it is fully developed by seven to nine years. Adult males may grow to over 13 feet (4 m) in length and weigh up to 4,500 pounds (2,000 kg). The females are much smaller at 10 feet (3 m) in length and 1,500 pounds (600 kg). The northern elephant seal is the second largest seal in the world, after the southern elephant seal.

The elephant seal is in the phocid, or true seal, family. It lacks external ear flaps and moves on land by flopping on its belly. The elephant seal has a broad, round face with very large eyes. Pups are born with a black coat, which is molted, or shed, at about the time of weaning, revealing a sleek, silver-gray coat. Within a year, the coat turns silvery brown.

RANGE/HABITAT: Northern elephant seals are found in the North Pacific, from Baja California in Mexico to the Gulf of Alaska and Aleutian Islands. During the breeding season, they live on beaches on offshore islands and a few remote spots on the mainland. The rest of the year, except for molting periods, the elephant seal lives well off shore (up to 5,000 miles, or 8,000 km), sometimes descending to over 5,000 feet (1,524 m) below the ocean's surface.

BEHAVIOR: While living in the open ocean, northern elephant seals spend a lot of time diving, up to two hours at a time. They rarely spend more than four minutes at the surface of the water between dives. It is believed that they eat deep-water, bottom-dwelling marine animals such as ratfish, swell sharks, spiny dogfish, eels, rockfish, and squid. Elephant seals molt each year between April and August, shedding not only their hair but also the upper layer of their skin as well. This is known as *catastrophic molt*.

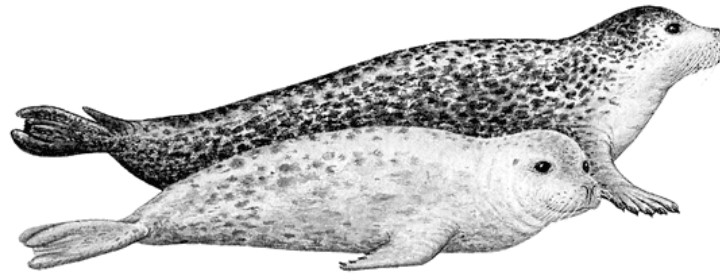
MATING AND BREEDING: Each winter, elephant seals arrive at their breeding beaches in Mexico and California. Males are the first to arrive and they fight each other to establish dominance. During this time, dominant males often inflate their noses and produce a noise that sounds like a drum to warn lesser males away.



Females soon arrive and associate with dominant males. Several days after coming onto the beaches, the females give birth to the pups they have been carrying since the previous year. Pups weigh about 75 pounds (35 kg) and are about four feet (1.25 m) in length. The pups nurse for about 28 days, generally gaining about 10 pounds (4.5 kg) a day. Around the time of weaning, the mother mates with one or more of the dominant males. After the nursing period, the mother returns to sea. For the next two months, weaned pups, called *weaners*, remain on rookery beaches, venturing into the water for short periods of time, perfecting their swimming abilities. Eventually, the weaners venture out into the ocean where they learn to feed on squid, fish, and occasionally small sharks.

STATUS: The northern elephant seal is a conservation success story. They were hunted to the brink of extinction, primarily for their blubber, which was used for lamp oil. By 1910, it is estimated that there were less than 100 elephant seals, all found on Guadalupe Island off Baja California, Mexico. Today, the northern elephant seal population is over 150,000 and is probably near the size it was before they were over-hunted.

AT THE MARINE MAMMAL CENTER: From approximately mid-February through the end of June, The Center's rescue and rehabilitation work focuses on orphaned elephant seal and harbor seal pups. Usually these mammals are washed away from the rookery during a storm and found stranded on public beaches or along the rocky shorelines. These pups are usually underweight. They also suffer from other diseases such as northern elephant seal skin disease, parasites, and pneumonia.



Harbor Seals (*Phoca vitulina*)

Source: The Marine Mammal Center website March 2009, used with permission

Meaning of scientific name: *Calf-like seal.*

DESCRIPTION: Harbor seals have spotted coats in a variety of shades from silver-gray to black or dark brown. They reach 5-6 feet (1.7-1.9 m) in length and weigh up to 300 pounds (140 kg). Males are slightly larger than females. They are true or crawling seals, having no external ear flaps. True seals have small flippers and must move on land by flopping along on their bellies. In San Francisco Bay, many harbor seals are fully or partially reddish in color. This may be caused by an accumulation of trace elements such as iron or selenium in the ocean or a change in the hair follicle.

RANGE/HABITAT: Harbor seals are found north of the equator in both the Atlantic and Pacific Oceans. In the northeast Pacific, they range from Alaska to Baja California in Mexico. They favor near-shore coastal waters and are often seen at sandy beaches, mudflats, bays, and estuaries.

MATING AND BREEDING: In California, harbor seal pups are born in March and April and weigh about 30 pounds at birth. If born prematurely, harbor seals retain a whitish lanugo coat (which is usually lost before birth). A pup can swim at birth, and sometimes rides on its mother's back when tired. Pups make a bleating noise that sounds like "maaaa." After about four weeks, the pups are weaned. Adult females usually mate and give birth every year. They may live 25 to 30 years.

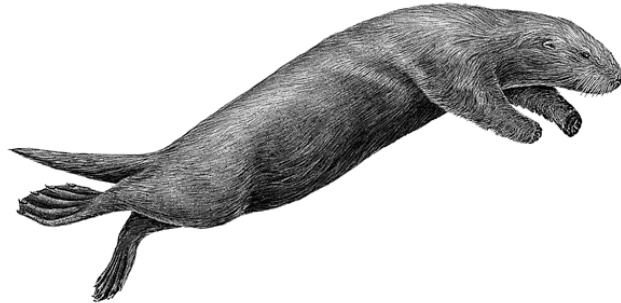
BEHAVIOR: Harbor seals spend about half their time on land and half in water, and they sometimes sleep in the water. They can dive to 1,500 feet (457 m) for up to 40 minutes, although their average dive lasts 3-7 minutes and is typically shallow. They are opportunistic feeders, eating sole, flounder, sculpin, hake, cod, herring, octopus, and squid. While harbor seals swim safely in the surf, they often curiously watch humans walking on beaches. However, they are wary of people while on land and will rush into the water if approached too closely or disturbed. In fact, if disturbed too often, they have been known to abandon favorite haul-out sites or their pups.

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STATUS: The total harbor seal population in the eastern North Pacific is estimated to be 330,000, and in California the estimated population was 40,000 in 1997. They are usually found in small groups, but sometimes occur in numbers of up to 500.

AT THE MARINE MAMMAL CENTER: From approximately mid-February through the end of June, The Marine Mammal Center's rescue and rehabilitation work is mainly focused around the care of harbor seal and elephant seal pups. Each year people find harbor seal pups on shore and pick them up, thinking the pups have been abandoned. Usually they are not abandoned; the mothers are just out hunting or watching nearby. This problem has caused many seals to be unnecessarily orphaned. These pups are then at further risk because they are unable to get needed antibodies from their mothers' milk, making them more susceptible to diseases. When they are being cared for at The Marine Mammal Center, they are kept in an area away from the other animals so they do not catch other diseases. If you see a harbor seal pup alone on a beach, remember to call The Marine Mammal Center at 415. 289.7325 to find out what to do.





Sea Otters (*Enhydra lutris*)

Source: *The Marine Mammal Center website March 2009, used with permission*

Meaning of scientific name: *Otter*.

DESCRIPTION: Sea otters are members of the weasel or mustelid family. Like other members of this family, they have very thick fur. In fact, at up to one million hairs per square inch, they have the thickest fur of any mammal. Their fur actually consists of two layers, an undercoat and longer guard hairs. This system traps a layer of air next to their skin so their skin does not get wet. Sea otters are usually dark brown, often with lighter guard hairs. Alaskan sea otters tend to have lighter fur on their heads. Sea otters are the smallest marine mammal. Adult females weigh 35-60 pounds (16-27 kg); males reach up to 90 pounds (40 kg). Alaskan sea otters are bigger, with males weighing up to 100 pounds (45 kg).

RANGE/HABITAT: Sea otters once ranged from Mexico to Alaska and across the northern Pacific Ocean to Japan. Currently, the California population numbers around 2,000 and is found from Half Moon Bay to Morro Bay. There is a much larger population in Alaska, and sea otters are still found in Russia. Sea otters inhabit shallow coastal areas and prefer places with kelp. The kelp acts as an anchor that the sea otters use to wrap themselves in when they are resting.

BEHAVIOR: Sea otters are social animals, with females and pups spending time together in one group and males in another. Pups stay with their mothers for the first eight months of their lives. The pups' fur traps so much air that they actually cannot dive underwater. When mothers leave the pups wrapped in kelp to hunt, pups bob on the surface of the ocean like a cork. Mothers spend much time grooming pups and often carry them on their chests. Pups begin to learn to swim at around four weeks of age.

Sea otters are one of the only marine mammals to use tools. They eat animals with shells, like clams and abalone, and use a stone to break open the shells. When sea otters are underwater searching for food, they store what they have found in the loose skin folds at their armpits. Adult sea otters can eat 25%-30% of their body weight in one day.

MATING AND BREEDING: Females usually have their first pup at the age of four or five. Their pregnancies last four to five months. Pups can be born any time of year, but in California,

Marine Mammals

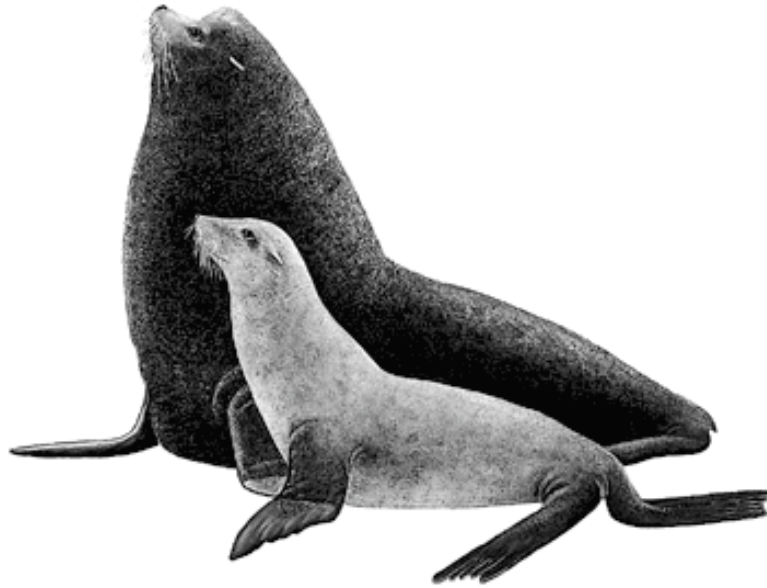
most are born between January and March, and in Alaska, most are born in the summer. When born, the pups weigh from three to five pounds.

STATUS: Sea otters in California are a threatened species due to past over-hunting for their beautiful fur. Although sea otters are protected now, they remain vulnerable, especially to oil spills. Unlike other marine mammals, sea otters do not have a blubber layer. Therefore, they rely on their fur to keep warm. If their fur is oiled, it loses its insulating qualities and the sea otters soon chill. Otters are also affected by oil fumes or poisoned by eating food exposed to oil. Most sea otters quickly die in an oil spill. Several thousand sea otters died in the 1989 Exxon oil spill in Valdez, Alaska. Other threats to sea otters include infectious diseases, parasites, boat strikes, entanglements, and toxins.

AT THE MARINE MAMMAL CENTER: The Marine Mammal Center began rehabilitating sea otters in 1995. Since that time, the Center has rescued up to 45 sea otters. The various reasons for their care at The Marine Mammal Center are infectious diseases, the most common being parasite infection, and separation from their parents.



Above, a western gull hopes to pick up some scraps of food as it watches a sea otter eating near the Pigeon Point Light Station.



California Sea Lions (*Zalophus californianus*)

Source: The Marine Mammal Center website March 2009, used with permission

Meaning of scientific name: *With crest and of California.*

DESCRIPTION: California sea lions are known for their intelligence, playfulness, and noisy barking. Their color ranges from chocolate brown in males to a lighter, golden brown in females. Males may reach 1000 pounds (more often 850 lb, or 390 kg) and seven feet (2.1 m) in length. Females grow to 220 pounds (110 kg) and up to six feet (1.8 m) in length. They have a dog-like face, and at around five years of age, males develop a bony bump on top of their skulls, called a *sagittal crest*. The top of a male's head often gets lighter with age. These members of the otariid or walking seal family have external ear flaps and large flippers that they use to walk on land. The trained "seals" in zoos and aquariums are actually usually California sea lions.

RANGE/HABITAT: California sea lions are found from Vancouver Island, British Columbia, to the southern tip of Baja California in Mexico. They breed mainly on offshore islands, ranging from southern California's Channel Islands south to Mexico, although a few pups have been born on Año Nuevo and the Farallon Islands in central California. There is a distinct population of California sea lions at the Galapagos Islands. A third population in the Sea of Japan became extinct, probably during World War II.

BEHAVIOR: California sea lions are very social animals, and groups often rest closely packed together at favored haul-out sites on land, or float together on the ocean's surface in "rafts." They are sometimes seen porpoising, or jumping out of the water, presumably to speed up their swimming. Sea lions have also been seen surfing on breaking waves. California sea lions are opportunistic eaters, feeding on squid, octopus, herring, rockfish, mackerel, and small sharks. In turn, sea lions are preyed upon by orcas (killer whales) and great white sharks.

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MATING AND BREEDING: Most pups are born in June or July and weigh 13-20 pounds (6-9 kg). They nurse for at least five to six months and sometimes over a year. Mothers recognize pups on crowded rookeries through smell, sight, and vocalizations. Pups also learn to recognize the vocalizations of their mothers. Breeding takes place a few weeks after birth. Males patrol territories and bark almost continuously during the breeding season.

STATUS: Their population is growing steadily, and California sea lions can be seen in many coastal spots such as Seal Rock or at Pier 39 in San Francisco. The current population is approximately 200,000.

AT THE MARINE MAMMAL CENTER: Each year, many California sea lions are treated at The Marine Mammal Center. Sea lions are known to have such diseases as pneumonia, caused by a parasitic lungworm, and a bacterial infection called leptospirosis, which affects their livers and kidneys. In 1998 and again in 2000, large numbers of sea lions were treated for domoic acid poisoning, a condition caused by harmful algal blooms, which causes the animals to have seizures. Other problems for California sea lions involve humans. Sea lions have been found illegally shot and also caught in drift or gill nets and other marine debris.





Steller or Northern Sea Lions (*Eumetopias jubatus*)

Source: The Marine Mammal Center website March 2009, used with permission

Meaning of scientific name: *Having a broad forehead and mane.*

DESCRIPTION: Steller or northern sea lions are sometimes confused with California sea lions, but are much larger and lighter in color. Males may grow to 11 feet (3.25 m) in length and weigh almost 2500 pounds (1120 kg). Females are much smaller, and may grow to nine feet (2.9 m) in length and weigh 1000 pounds (350 kg). Steller sea lions are light tan to reddish brown in color. They have a blunt face and a boxy, bear-like head. Adult males do not have a visible sagittal crest (the bump on the top of their heads), as is seen in adult male California sea lions. Stellers have a bulky build and a very thick neck, which resembles a lion's mane, hence the name "sea lion."

RANGE/HABITAT: Stellers are found throughout the North Pacific Rim from Japan to central California. Unlike California sea lions, Stellers tend to remain offshore or haul out in unpopulated areas. Breeding occurs along the North Pacific Rim from Año Nuevo Island in central California to the Kuril Islands north of Japan, with the greatest concentration of rookeries (breeding grounds) in the Gulf of Alaska and Aleutian Islands.

MATING AND BREEDING: Pups are born on offshore islands from mid-May to mid-July, and weigh 35-50 pounds (16-23 kg). Mothers stay with pups for one to two weeks before hunting at sea. Then they spend roughly equal amounts of time hunting and nursing pups on land. Pups usually nurse for a year, but some continue to nurse for up to three years. Mating occurs 10-14 days after the pups are born. Dominant mature males maintain territories for one to two months and mate with many females. During the breeding season, males do not eat.

BEHAVIOR: Steller sea lions eat a variety of fish, invertebrates, and occasionally other pinnipeds. Known predators are killer whales (orcas) and white sharks.

STATUS: The current population of Steller sea lions is about 40,000, with about 500 living in California. However, there is great concern about this population, which has dropped by 80% in the last 30 years. In 1997, the western stock in Alaska was listed as endangered and the eastern stock of the Continental United States and Canada was listed as threatened. Reasons for this decline are not known. However, researchers believe that a decline in the fish they eat is the biggest cause. The decline of fish could be due to increasing commercial fisheries in the Gulf of Alaska. Drowning, entanglement in nets, and gunshot are all possible reasons for the Stellers' decline. Stellers are protected under the Marine Mammal Protection Act, which forbids the killing, harming, or harassing of any marine mammal, as well as the Endangered Species Act. With this federal protection, there is hope for the recovery of the Steller sea lion population.

AT THE MARINE MAMMAL CENTER: The Marine Mammal Center has not rescued many Steller sea lions because they haul out on offshore rocks. Most Steller sea lions that The Center rescues are orphaned pups. In addition, Stellers are susceptible to many of the same diseases as California sea lions, such as leptospirosis and San Miguel sea lion virus. Because of their threatened status, Steller sea lions released from The Center are fitted with a satellite tag. This has enabled us to track their movements. To date, the three Steller pups released, Artemis, Mozart, and Beethoven, have thrived in the wild, foraging and hauling out with other Steller sea lions.



Northern Fur Seals (*Callorhinus ursinus*)

Source: The Marine Mammal Center website March 2009, used with permission

Meaning of scientific name: *Bear-like with beautiful hide (fur).*

DESCRIPTION: Fur seals are known and named for their thick fur, which has as many as 300,000 hairs per square inch. They were first named *sea bears* by Europeans, similar to their scientific name, which means *bear-like*. Pups are born with a black pelt, which becomes dark brown with lighter coloration on the chest and belly. Adult males also have gray hair on the backs of their necks. Males are much larger than females, even at birth. Male pups weigh 12 pounds (5.4 kg) and grow to 385-605 pounds (175-275 kg) and seven feet (2.1 m) in length. Female pups, however, only weigh 10 pounds (4.5 kg) and grow to 66-110 pounds (30-50 kg) and 4.5 feet (1.4 m) in length.

RANGE/HABITAT: The full range of the northern fur seal extends throughout the Pacific rim from Japan to the Channel Islands of California, although the main breeding colonies are in the Pribilof and Commander Islands in the Bering Sea. Smaller rookeries (breeding grounds) exist on the Kuril Islands north of Japan, Robben Island in the Sea of Okhotsk, and on San Miguel Island off Southern California. Northern fur seals live almost all of the time in the open ocean, and only use certain offshore islands for pupping and breeding. They rarely come ashore except during these times, and are almost never seen on mainland beaches unless they are sick.

MATING AND BREEDING: Adult males establish territories in late May to early June and aggressively guard and herd 40 or more females. Pregnant females arrive at the rookeries in June and give birth two days later. They nurse for about 10 days, then go to sea to feed for four or five days. After that, they feed for eight to ten days and nurse for one to two days. Pups are weaned after about four months on this cycle. Death rates are high (10-50%) throughout a fur seal's life, but they can live to about 26 years.

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BEHAVIOR: Northern fur seals feed on small schooling fish, such as walleye, pollock, herring, hake, anchovy, and squid. Although they feed on fish found in the open ocean, they are not deep divers. They usually dive to about 200 feet (68 m), and their maximum dive depth is about 600 feet (about 200 m). These mammals are pelagic (open ocean) so they cannot always haul out to rest. They have developed a behavior called *jug handling*, keeping their front and rear flippers out of the water while bobbing on the surface.

STATUS: Once hunted in large numbers for their luxurious pelts (such as those made into coats worn at football games in the 1930's and 1940's), northern fur seals are now protected under the Marine Mammal Protection Act as a depleted species. This means that it is illegal to kill them except for research or native subsistence. The current world population is less than one million and is declining. Commercial fishing operations may be contributing to the decline, by decreasing availability of fish and entanglement in fishing gear. Also, fur seals are especially sensitive to changes in their environment, as seen in the record numbers of sick or starving fur seals rescued at The Marine Mammal Center during El Niño years.

AT THE MARINE MAMMAL CENTER: In normal years, The Marine Mammal Center admits about five northern fur seals. During El Niño years, this number dramatically increases. This is because northern fur seals are very sensitive to the warming ocean waters of El Niño.