

location" program was tried by moving 130 otters to one of the Channel Islands. Recently, a "no-otter zone" was tried below Santa Barbara. Neither effort has proven to be very successful.

Otters play an important role in the Monterey Bay area. Biologists consider them a "sentinel" species. They tend to indicate to us the general health of our overall



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local environment. In addition, otters are considered a "keystone" species that plays a vital role in balancing the local ecosystem. They eat sea urchins that feast on the kelp beds. In this way the otters help the kelp beds to flourish. The kelp then offers a haven and a very productive habitat for many small fish and invertebrates.

Marine biologists point out that otters have a "low genetic variability" that may make them more susceptible to diseases and

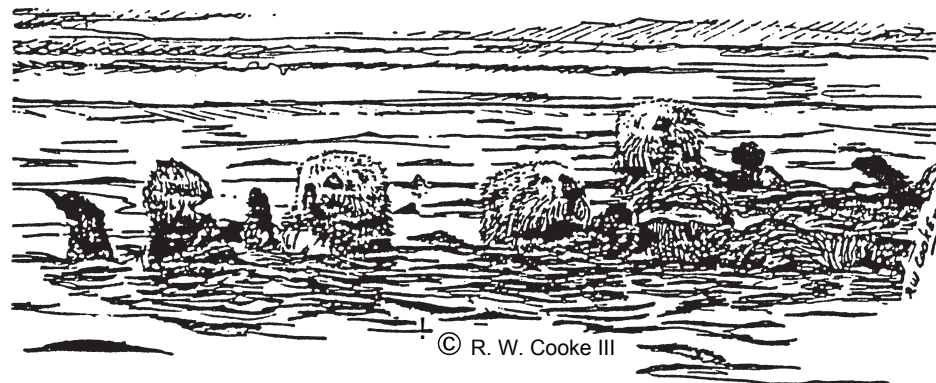
environmental changes. This fact may contribute to their slow growth in numbers since the 1930s.

Other natural threats include the hazards of living in the sea itself. The Big Sur coast can experience severe winter storms. A young pup can easily get separated from its mother in rough waves. The ocean also periodically serves up a deadly algal bloom containing the toxic domoic acid that can kill birds and sea lions.

These algae also contaminate the otter's food. Natural predators include the great white shark and the killer whale (Orca).

Man still represents the greatest threat to the continued survival of the sea otter. A major oil spill, especially from a large tanker, could endanger the entire otter population. Oil on the fur will destroy the insulating properties and cause death by chilling. Ingestion of oil-contaminated shellfish can also cause death.

One of the most complex threats is the question of man-made water pollution. Evidence shows that land runoff and sewage spills may be harming the otters. Some of the chemicals thereby introduced are



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known to suppress the immune systems of fish and marine mammals. A recent study found several types of bacteria and parasites in otters that are similar to those found in humans and wild and domestic cats. A further

study of dead otters found along the Central Coast implicated such infectious diseases in more than 40% of those deaths.

Everyone should do their part to ensure the continued growth of the sea otter population.

How sad it would be to lose these fascinating creatures. To learn more, join a docent-led nature walk and look at the otter displays at the Information Station. You will be glad you did!

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Hall Warren (most recent revision, 2014)

The Southern SEA OTTER



"Where are the sea otters?"

Without a doubt, these marine mammals are the most interesting and beloved of all the inhabitants in the Reserve.

Imagine a small playful animal with webbed hind feet, a slightly flattened tail, and beautiful soft brown fur. Now picture this same animal with a lovable whiskered face sleeping peacefully on its back in a kelp bed or just

rolling around having fun... this is the Southern Sea Otter, *Enhydra lutris nereis*.

At times it can be difficult to find an otter because to the untrained eye, bobbing bull-head kelp resembles a floating sea otter. During storms, when the wind comes out of the south, the otters may be found in the more protected coves. On calmer days, you are apt to discover them

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resting offshore in their favorite kelp beds, either singly or in groups called "rafts."

Sea otters spend almost all their time in the ocean--they eat, sleep, mate, give birth and feed their young at sea. They are the only marine mammal with paws, and use their dexterous and powerful forelegs to capture the invertebrates that cling to the rocky bottom.

In its underwater search for food, an otter may use a rock as a tool to dislodge abalone and sea urchins from their tight grasp of the seafloor. This rock may be brought to the surface, along with the food, to be used as an anvil to crack open hard shells. This noisy pounding may alert you to the presence of a sea otter. Pouches of loose skin under the arms can be used to hold food or tools during dives or while on the surface. Otters consume large quantities of many different marine invertebrates, from sea urchins to octopus to abalone.

Sea otters can see clearly in both water and air. An adult otter has a strong jaw with 32 teeth, including long canines to help grab food and broad flat molars for crushing hard-shelled prey. Their

lungs are 2.5 times larger than most mammals of equivalent size to help them regulate buoyancy and store more oxygen for their dives, which average 1 minute but can be as long as 4 minutes.

Sea otters are the only marine mammals that routinely swim and rest on their backs. An otter floating on its back moves its tail in a sculling motion to shift or maintain its position.

The life span of sea otters averages about 10-12 years with a maximum of probably 15-20 years. Females live slightly longer than males. Overall length is approximately four feet. Males average 65 pounds; females about 45 pounds.

Otters live their entire lives in the ocean, rarely coming ashore. They seldom venture more than a mile from shore or into water much deeper than 100 feet.

Sea otters live in waters ranging from 35° to 60° F., yet they must maintain a constant body temperature close to 100° F. Unlike other marine mammals like seals or sea lions, they do not have blubber to keep them warm. Instead, they depend on their remarkably dense, water-resistant

fur to insulate them against the cold ocean. Their fur has two layers. The long outer guard hairs give it that soft appearance. Under the guard hair layer, the otter has a shorter, extremely fine and dense underfur. One square inch of otter fur contains between 600,000 and 1,000,000 fibers, the most dense of any animal on earth. By comparison, a human head contains about 100,000 hairs.

In order to maintain this luxurious coat of fur, sea otters must spend a lot of time grooming and cleaning their fur to retain its special insulating qualities. This activity also traps air between the many small fibers. This entrapped air provides both buoyancy and an insulating bubble barrier that keeps the skin dry and warm under water, much like a diver's dry suit. Special glands also secrete oil to help waterproof the fur. The otter's coat is loose on its body so it can pull it around to clean areas that are hard to reach.

Another way an otter keeps warm is through a process called thermo-regulation. They increase their rate of body metabolism by maintaining a high level of internal

heat production. To keep this "furnace" going they need to eat approximately 25% of their body weight each day. For a 160 pound human, this would mean eating about 40 pounds of food per day. Since an otter's forepaws and webbed fins have little or no fur, they often float on their backs with their "feet" in the air to warm them and to conserve body heat.

Otters mate and give birth any time of the year, but there is a peak in pupping from January through March, followed by a second, less productive period from August to October. Males mate with as many females as possible. Females usually mate with only one male per estrus. The otters pair-bond anywhere from 1 to 10 days while the female is in estrus. Females give birth for the first time when they are about three or four years old, and one pup is born every one to two years. Gestation lasts about six months.

The newborn pup, born in the ocean and weighing 3-5 lbs., is totally dependent upon its mother. It is so buoyant that it floats on the surface of the water, unable to dive until it is about two months old. The mother grooms and nurses the pup for five to eight months. The father

is absent as a care-giver. Look carefully for a mother otter lying on her back in the kelp with a small "woolly pup" upon her chest.

The sea otter once ranged from Baja California in Mexico up the

researchers to suspect that the recovery may be at a plateau.

Although fully protected under California law, the southern sea otter remains a threatened population. If their numbers were to



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West Coast to the Pacific Northwest. In California alone, there may have been as many as 15,000 animals. By the early twentieth century, the ruthless hunting of this animal had resulted in its virtual disappearance. A small colony (about 50 otters) near Big Sur, California came to public attention in 1938, and under state and federal protection, expanded slowly until the mid 1970s, when it began to shrink. In 1977, the U.S. Fish and Wildlife Service declared the southern sea otter "threatened" under the Endangered Species Act. The most recent (2010-2012) 3-year average is 2,712 otters, leading

decline to fewer than 1,850, they would be uplisted to the "endangered" category.

Since the discovery of the small colony in Big Sur, their range has continued to expand over the years. In 1960 their Central Coast range reached north to Monterey and south to Point Piedras Blancas near San Simeon. In 1980, their range reached from Santa Cruz to Pismo Beach. The officially recognized range of the sea otter in 2010 and 2012 was from Pigeon Point in the north to Gaviota State Park to the south, a total distance of more than 300 coastal miles.

In the late 1980s a "trans-