Natural History of the Southern Sea Otter

Compiled by Gena Bentall, Program Coordinator, Sea Otter Savvy
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 850,000 to one million hairs per square inch, they have the thickest fur of any mammal. Their fur consists of two types of hairs, interlocking underfur (which provides insulation) and longer guard hairs (that help water run off the coat). This system traps a layer of air next to their skin so, when fur is well groomed, their skin does not come in contact with sea water. Sea otters are usually dark brown, and some individuals may be progressively lighter colored (grizzled) on the head, neck, chest and forearms due to loss of pigmentation in the guard hairs. Extent of grizzle can be related to age and individual variation. Sea otters are the smallest marine mammal, and with their flipper-shaped hind feet are well adapted to a marine environment. In California 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 as much as 100 pounds (45 kg).

Range/Habitat

Sea otters once ranged around the North Pacific Rim from Mexico through Alaska, Russia, and Japan. The maritime fur trade of the 1700-1800s brought sea otters to the brink of extinction and fragmented the once continuous population. There are currently 3 subspecies of sea otter, the Northern Sea Otter (Enhydra lutris kenyoni), the Asian, or Russian, Sea Otter (Enhydra lutris lutris) and our Southern, or California, Sea Otter (Enhydra lutris nereis). Currently, the California population numbers around 3,000 and ranges from Half Moon Bay to Santa Barbara. Sea otters inhabit shallow coastal areas and prefer places with kelp. Sea otters secure themselves by wrapping in kelp surface canopy when resting. Mothers of young pups will often secure their pups in kelp surface canopy when they dive in search of food.

Map of the pre- and post-fur trade ranges of sea otters
Mating/Breeding

Males may mate with multiple females successively throughout the year. Females will often mate with a single male during estrous (sometimes more than one), especially if they form a pair bond. Pair bonds last for several days during which the male and female stay in very close proximity. During mating, males grasp the female’s nose and face with their teeth, sometimes drawing blood or leaving a persistent light-colored scar. In some parts of California, injuries to the nose incurred during mating can be severe and even life threatening. Females give birth to one pup and usually have their first pup at the age of three or four. The gestation period is 6 months on average and includes a period of delayed implantation of the embryo, thought allow the female to put on fat between the weaning of the prior pup and birth of the next. Pups can be born any time of year, but in California there is a peak in pupping between January and March. When born, the pups weigh from three to five pounds. Females devote a considerable amount of energy to pup rearing, while males provide no parental care. By the end of the pup dependency period, females may be expending twice as much energy producing milk, sharing prey, and caring for their pups as they would during periods without a pup. This can result in seriously compromised health and body condition of the female at the time of pup weaning, particularly in range center populations where sea otters are present at high densities and the food supply is limited. During this time, female sea otters may be particularly vulnerable to changes in prey abundance, aggressive males, and disease. Chronic disturbance by kayaks and other marine recreation activities may cause unnecessary depletion of energy at this critical stage of reproduction.
Behavior

Sea otters are social animals, with females with pups coming together to rest in groups known as rafts, which are sometimes guarded by a territorial male. Bachelor males (young males, males that haven’t acquired territories, and territorial males on “breaks”) will often gather in all male rafts where they rest and spar with one another in play-like bouts that rarely result in injury. In contrast, when guarding a territory, territorial males will attempt to exclude all other males—sometimes aggressively. Pups are dependent on their mothers for the first 6-8 months of their life. The dense “natal” coat of young pups traps so much air the pup is unable to dive. When mothers leave the pups nestled in kelp to dive for prey, 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, and lose their super buoyant natal coat at around 8-10 weeks of age, at which point they are able to dive alongside their mothers.

Sea otters feed primarily on benthic invertebrates like crabs, sea urchins, sea stars, clams, worms, abalone, and marine other snails, and have been observed feeding on more than 75 different species in CA. In parts of the range where they are competing with other sea otters for...
food, they can become specialized in types of prey. Sea otter scientists currently recognize five different dietary specialization types: 1) Cancer-type crabs; 2) abalone; 3) mussels; 4) sea snails; and 5) clams. Sea otters are one of the few animals to use tools and will use a rock like an anvil or hammer to break open hard-shelled prey like snails and clams. Sometimes they will use the claw of a crab to break open the crab’s own shell! Contrary to popular myth, sea otters do not carry a single tool with them throughout their life and will select a new tool for each foraging bout. When sea otters are under water searching for food, they sometimes store what they have found in the loose skin folds at their armpits. In order to help stay warm while living in a cold-water environment, sea otters have very high, heat-generating metabolisms and need to eat roughly 25% of their body weight every day to stay healthy! Sea otters primarily rely on their sense of touch to locate prey, using their sensitive forepaws and whiskers to probe crevices and sea floor for invertebrates. They may feed equally during the day and at night.

The heat generated by their metabolism is insulated by their dense fur coats, and sea otters must devote 8-12% of their time to grooming their fur to keep it in good condition. In a healthy, well-groomed sea otter coat, the insulating air layer prevents cold water from ever touching their skin. While grooming, sea otters may roll about, turn somersaults, scrub with their fore and hind feet, and even blow air into their coat with their mouth.

**Status**

Sea otters in California were federally listed as threatened under the Endangered Species Act in 1977 due to their low overall numbers, limited range, and vulnerability to a catastrophic event such as an oil spill. 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 the oil fumes or poisoned by eating food exposed to oil and attempting to groom an oiled coat. Most sea otters quickly die in an oil spill. Several thousand sea otters died in the 1989 Exxon oil spill in Valdez, Alaska. The number of Southern Sea Otters killed by Great White Sharks (*Carcharodon carcharias*) in California has dramatically increased to as much as 60% of known mortalities (2016) in recent years. Scientists do not fully understand the cause of this increase although they suspect that sharks only “sample” sea otters while hunting for more suitable prey like seals.

Other threats to sea otters include infectious diseases, parasites, boat strikes, fishing gear entanglements, and toxins. At the center of the range in California (roughly Moss Landing to San Luis Obispo), the sea otter population is thought to be at or near carrying capacity. That is, the population
numbers are as high as current resources levels (specifically prey) can support. Change may be in progress along the central coast, however, as abundance of sea urchins, a favorite prey of sea otters, has increased at some locations due to the loss of the large, predatory Sunflower Star (*Pycnopodia helianthoides*) to Sea Star Wasting Disease. With the sunflower stars gone, sea urchin populations skyrocket, and current research is examining how sea otters respond to this increase in availability of a nutrient rich food source. In the absence of increased prey availability at range center, further population growth can occur only through expansion at the range ends to the north and south. Sea otters are additionally protected under the Marine Mammal Protection Act.

**Moss Landing Sea Otters**

Researchers with US Geological Survey, the Monterey Bay Aquarium, the Elkhorn Slough National Estuarine Reserve, and others participate in long term data collection on tagged sea otters in Moss Landing. You will see otters with brightly colored tags on their hind flippers—the color combination and positioning of the tags are unique for each otter. The researchers study foraging (what the otters eat), where the otters live in the slough and harbor, and how well they reproduce and survive. During this study (which concluded in fall of 2016) researchers were out daily tracking the tagged otters from shore and boats using antennas and high-powered spotting scopes. One recent study has shown that the presence of sea otters in the slough has increased the health of the eelgrass beds that are important for overall estuary health. Tiny sea slugs keep the surface of the eelgrass clean. By feeding on a crab that in turn feeds on the sea slugs, sea otters allowed slug numbers to increase and eel grass to flourish. From bimonthly counts, we know that there are typically around 100 sea otters living in the slough and harbor, but this number fluctuates seasonally.

*Male bachelor group in Moss Landing harbor. Photo G Bentall*
The large group that forms in the north harbor, inside the jetty is a bachelor group and is typically composed entirely of males. When in this group, the males rarely fight, but instead engage in mock contests, or sparring to practice and learn skills. Males of all ages may be in this group with many only visiting part time, leaving periodically for the open Monterey Bay. Members of this bachelor group will also regularly rest on the beach curving northward inside the north jetty. This behavior, known as hauling out, is not uncommon in sea otters, but most often occurs in hidden places or darkness when sea otters feel safer. Researchers studying this behavior have found that, once out of the water, sea otters’ body temperature warms more rapidly and stays warmer longer when they are hauled out. The social interactions, proximity to food resources and haul-outs, and relative safety from shark predators make this bachelor area an important place for California’s male sea otters.

**Morro Bay Sea Otters**

*Male sea otters “hailed out” in Moss Landing. Photo G Bentall*

*The numbers of sea otters regularly inhabiting the waters inside Morro Bay Harbor have significantly increased over the last decade. During the 1990s through 2010 the number of otters inside the Bay were generally well below ten. Since 2010 the numbers have increase with most recent surveys counting more than 40 sea otters inside the protected waters of the Morro Bay Harbor.*

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**Morro Bay Sea Otters**

*A raft of females with pups near the south T-pier in Morro Bay. Photo by G Bentall*
Why are there more sea otters in Morro Bay? Resources drive the need of sea otters to inhabit a specific area. Resources that are important to sea otters are food (high densities of their invertebrate prey), refuge from predators like white sharks, and safe habitat to rest and rear their offspring. Morro Bay may offer any or all of these to the sea otters living there. We know from studies of tagged sea otters, that those we see in Morro Bay may travel north to Cayucos, Cambria, or even San Simeon, or south to Pt. Buchon. As both sea otter and marine recreationists numbers increase it's reasonable to predict a substantial increase in sea otter/human interactions in the harbor. When the *Macrocystis* canopy is present at Target Rock, 20-30 sea otters may be resting in the kelp bed. At Coleman Beach, sea otters gather in groups of 2-20 in the shallow open water 10-70 meters from shore or within eelgrass beds at low tide. Sea otters often seek surface canopy of kelp or eelgrass to anchor themselves while resting singly or in groups called rafts. Canopy availability in the harbor is dependent on tide level, currents, and seasonal persistence of kelp and eelgrass, with the Target Rock ledge providing the only suitable rocky substrate needed for *Macrocystis* to thrive. In Morro Bay, sea otters may also rest in eel grass beds or in open water if kelp canopy is not available. When kelp canopy is absent in winter, a large raft of females with pups may gather inside the south public T-pier near the Embarcadero. Sea otters on the San Luis Obispo county coast spend between 10 and 12 hours resting or sleeping each day.

**Sea Otters and Disturbance**

Disturbance to the natural behavioral patterns of sea otters can occur in areas where human marine recreation activities and sea otter habitat overlap. Sea otters are very charismatic and viewing and/or photographing them may often be a primary goal of marine recreationists. Kayakers, stand-up paddlers, scuba divers, ecotour operators, and others are often unaware that the manner in which they behave near otters can cause disturbance to important behavioral patterns and result in wasted energy, increased stress, and potentially pup abandonment. Because sea otters don’t store energy in the form of fat, they are always dependent on a delicate balance of energy income (in the form of food) and energy expense (in the form of activities such as swimming back and forth to foraging areas, social interaction, fur maintenance, and care for their pups). Swimming and diving to avoid watercraft that approach too close or too aggressively results in an additional energy expense burden. If an energy deficit is the result, the sea otter must either find more prey to eat or risk losing body condition, which is elemental to good health, disease resistance, reproductive success, and survival.

There are simple guidelines marine recreationists can follow to avoid disturbing sea otters. Practice these yourself, and encourage others to do the same!
1. Maintain a respectful distance. It is often hard to judge distance, so we recommend at least 5 lengths of your kayak (around 20 yards). Give all wildlife plenty of space!

2. Avoid direct approaches, that is, maneuvering your craft directly at an otter or raft of otters. This can be perceived as much more threatening than passing by parallel or obliquely, keeping a steady pace. Imagine you are watching the Queen Mary come in to port---would you feel less threatened watching from the middle of the boating channel, or from the safety of the dock as the ship passes by?

3. Do not encircle sea otters with watercraft—they will feel trapped. If someone else is already watching, wait your turn before approaching.

4. Pay attention! Keep a watchful eye on the sea otters for changes in behavior. If they raise their heads and look at you they are warning you that you are getting too close. Their next step might be to dive and swim away. If they are looking at you, you have entered their world. If they move because of you it’s harassment.

Encourage people to think about the needs and well-being of sea otters when they are viewing them. Armed with a little information, we can share the coastal environment respectfully and peacefully with sea otters! Understanding the needs of sea otters is most important to help prevent disturbance, but don’t forget, sea otters are protected from harassment by two federal laws, state law and a number of local laws and regulations. Harassment and disturbance of them, even when unintentional, violates the law!

Kayakers in Moss Landing often paddle too close to resting sea otters. Photo by G Bentall

- Report cases of severe harassment by calling 1-888-334-CalTIP (888-334-2258)

For sick and injured sea otters:
- Monterey, Santa Cruz counties: Monterey Bay Aquarium, (831) 648-4840
- San Luis Obispo county: The Marine Mammal Center, (415) 289-7325

- Learn more at the Sea Otter Savvy website: www.seaottersavvy.org
- Questions? info@seaottersavvy.org
**Sea Otter Quick Stats!**

1. The average life span for a sea otter is 15-20 years. Males usually don’t live longer than 15 years.
2. Average weight of an adult male in CA = 30 kg (66 lbs)
3. Average length of an adult male in CA = 1.3 meters (4.2 ft)
4. Pups per year: 1 (twins are rare, and the mom can only care for one)
5. Gestation: 6 months total (~ 2 months delayed implantation + 4 months active pregnancy)
6. Season sea otter pups are born = spring, summer, fall, winter (any season!)
7. Average amount of time that sea otter pups are dependent on their mom = 6 months
8. Average daily (kilo)calories consumed by an adult male = 4,300
9. Deepest recorded sea otter dive in California = 264 feet (9-year old male from SLO county)
10. Longest recorded sea otter dive in California = 7.9 minutes (10-year old male from Monterey county)
11. Average dive depth in California = 24 feet
12. Average dive duration in California = 61.5 seconds
13. Hairs per square inch on a sea otter’s foreleg > 1,000,000 (humans have 100,000 on their entire head)
14. Average number of hours spent foraging each day by central California sea otters = 9.5-12 hours (40-50 % of 24 hours)
15. Sense most used to locate prey (especially in dark or turbid water) = touch (paws and whiskers)
16. Prey on which sea otters are most likely to use a tool = sea snails, clams, and mussels
17. Most common sea otter prey in CA: *Cancer*-type crabs (Rock crabs and Dungeness crabs)
18. Number of prey specialist foraging types in CA = 5 (*Cancer*-type crabs; 2. abalone; 3. mussels; 4. sea snails; and 5. clams)
19. Most common known cause of death for CA sea otters = bite from Great White Shark (~ 60 % of mortality, 2017)
20. Sea otter mating fact: male sea otters bite a female’s nose during mating, perhaps to keep hold of her in a watery environment. Some bites can result in serious, even life-threatening wounds.
21. Primary reason for listing of CA sea otters as "threatened" in 1977 under the Endangered Species Act = Risk of oil spills
Be Sea Otter Savvy

Follow these tips for safe sea otter viewing:

- Give them space—At least 5 kayak lengths
- Be alert—Back away if you see behavior changes
- Avoid approaching head on—a direct approach may scare them
- Don’t encircle them—they’ll feel trapped

Are you looking out for sea otters?

Sea otters are the smallest marine mammal and they rely on their fur to keep warm. They have very little body fat and don’t store energy well. To be healthy and successfully rear their pups, they need to:

- Rest a lot
- Eat a lot
- Groom a lot

When we get TOO CLOSE they may become frightened and dive or swim away. Become nervous, or stop feeding.

If I’m looking at you, you’re TOO CLOSE!

Be respectful—don’t cause them to change their behavior.