

# Qualia

## Sea otters free to roam down California coast

January 7, 2013 | Author: AAAS member -- Freelance Writer Mary Bates, Ph.D.



A sea otter in 2007 near Morro Bay, California. (Image: Mike Baird, [www.bairdphotos.com](http://www.bairdphotos.com), under a Creative Commons license)

The U.S. Fish and Wildlife Service has decided to end its sea otter relocation program, allowing the marine mammals to roam freely down the southern California coastline. The relocation program was initiated 25 years ago, in an effort to create "otter-free zones" in waters reserved for fishermen. Now, federal officials are terminating the failed initiative, allowing sea otters to expand throughout their natural range along the California coast.

AAAS member Katherine Ralls is a senior research zoologist with the Smithsonian Conservation Biology Institute and an expert on sea otters. I asked Ralls about what this decision means for sea otter populations on the west coast and the ongoing conflict between sea otters and fishermen.

**AAAS Member Central: What was the historical range of sea otters along the west coast of North America, and what does their range look like today?**

**Katherine Ralls, AAAS member and senior research zoologist with the Smithsonian Conservation Biology Institute:** Sea otters historically ranged along the entire western coast of North America, from central Baja California in Mexico northward along the Pacific coast to Alaska. Their range extended east along the Aleutian archipelago to the Commander Islands and Kamchatka and then south to Hokkaido Island in Japan. Sea otters were hunted nearly to extinction in the 18th and 19th centuries until in 1911 only 13 small remnant populations remained. Although northern sea otters have recolonized much of their historical range, the southern sea otter now occurs only along the coast of central California from approximately Pigeon Point (south of San Francisco) to just below Point Conception (north of Santa Barbara). A small population occurs off San Nicolas Island in Southern California, which is descended from otters captured along the central coast of California and released there in the late 1980s. There are no sea otters in Oregon but there is a population in Washington that is descended from Alaskan sea otters released there in 1969-70.

**AAASMC: How has the population of California or southern sea otters changed in the last century? What is their status today?**

**Ralls:** In 1914, the total population of southern sea otters was estimated at about 50 individuals in the Big Sur area. Since then, the population has gradually increased in size and expanded its range. Today there are about 2,700 to 2,800 individuals along the mainland coast but the population has not increased since 2006. There are also about 50 individuals at San Nicolas Island. Southern sea otters are listed as threatened under the U.S. Endangered Species Act (ESA), primarily due to the small size of the population, its restricted range, and its vulnerability to a major oil spill.

The recovery plan for the southern sea otter states that the population can be considered for delisting under the ESA when the average population level over a three-year period exceeds 3,090 individuals. However, the population is also protected under the Marine Mammal Protection Act, which states that marine mammals must be managed to their optimum sustainable population level. The optimum sustainable population level for the southern sea otter is believed to be at least 8,400 individuals.

**AAASMC: What are some of the challenges and threats facing the population of southern sea otters that you study?**

**Ralls:** Southern sea otters face numerous problems. The population is at carrying capacity in the center of its range where it is limited by its food supply. This means that the population cannot increase in size without expanding its range. As a near-shore species, otters are threatened by a number of pollutants and disease organisms that are washed from the land to the sea. Sea otters can also be killed in gill nets and fish traps, although efforts have been taken to minimize these problems. Recently, there has been a dramatic increase in the number of sea otter deaths due to shark attacks.

**AAASMC: What have you been able to learn so far about the population dynamics, movements, and decline of sea otters off the California coast? What kind of data are you collecting, and what else do you hope to learn?**

**Ralls:** In the late 1980s, my colleague Dr. Donald Siniff of the University of Minnesota and I pioneered the use of implanted radio transmitters in sea otters. This technique, which is still used by most scientists studying sea otters, yielded a wealth of new information. For example, we found that sea otters moved greater distances and ranged farther offshore than previously suspected and that some juvenile females spent nearly 50% of the 24-hour day foraging. We also calculated the first survival and reproductive rates for southern sea otters. Although I am still involved with sea otter research through the Southern Sea Otter Research Alliance, field efforts today are led by Dr. Tim Tinker of the U. S. Geological Survey. We know that southern sea otters have a mortality problem, not a fecundity problem. Most females have a pup every year but mortality is high in both younger age classes and prime age females. Although many otters die of disease, it is not clear that eliminating any particular disease would lead to increased population growth because the population is food-limited. The recent dramatic increase in deaths due to shark attacks is very worrying.

**AAASMC: Conservationist groups have welcomed the U.S. Fish and Wildlife Service's decision to allow sea otters to roam freely off the California coast, but some fishermen are concerned that the animals could deplete shellfish stocks. What do you think about the decision, and what consequences could it have for the otters?**

**Ralls:** The Fish and Wildlife Service (FWS) made the decision that is best for sea otters. This was an appropriate decision because FWS is responsible for increasing the size of the sea otter population until it can be removed from the endangered species list. The sea otter population is limited by its food supply and cannot increase substantially in numbers without expanding its range. Unfortunately, the decision that is best for sea otters is not the best decision for shellfish fishermen. Sea otters and commercial shell fisheries cannot exist in the same place; this incompatibility was what gave rise to the attempt to create “otter zones” and “no-otter zones” when otters were translocated to San Nicolas. However, it proved impossible to keep otters out of “no-otter” zones by nonlethal means. Sea otters are a keystone species in the nearshore environment: they promote the growth of kelp by eating invertebrates such as sea urchins that eat kelp. As kelp provides habitat for many organisms, sea otters increase the biodiversity of the ecosystem. Although sea otters and shellfisheries are incompatible, several studies have shown that the overall economic impact of sea otters is positive. An excellent documentary on the problems faced by the southern sea otter and sea otter/shellfishery conflicts is available at <https://vimeo.com/56121277>.

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