

Questions and Answers about Diablo Canyon Sea Otter Research

1) Under what authority is the sea otter research being conducted?

The U.S. Geological Survey and its research partners—the California Department of Fish and Wildlife, the Monterey Bay Aquarium, the University of California, and others—are conducting research along the central California coast in support of recovery of the southern sea otter, a threatened species under the Endangered Species Act. The work is authorized under a five-year scientific research permit issued in 2008 by the U.S. Fish and Wildlife Service Division of Management Authority in Washington, D.C.

2) Why was a scientific research permit issued in 2008 when PG&E's plan for seismic testing was developed only recently, in response to events that followed the 2011 earthquake and tsunami at Fukushima, Japan?

The scientific research permit is independent of the proposed Incidental Harassment Authorization that was requested by PG&E. The U.S. Geological Survey and its partners have been conducting research in support of southern sea otter conservation, as prescribed by the recovery plan, for many years. They have a long record of safe and humane handling of sea otters, and their study results have been published in peer-reviewed journals. The current research follows protocols that have been in place for many years and will produce results that are comparable with other studies that have been conducted elsewhere in the range of the southern sea otter in California and in the range of the northern sea otter in Washington, British Columbia, and Alaska. The recovery plan for the southern sea otter is available at: http://www.fws.gov/ventura/species_information/so_sea_otter/ssorecplan.pdf

3) Why was a research project proposed in connection with PG&E's request for authorization to conduct a seismic survey?

The U.S. Fish and Wildlife Service recommended that PG&E fund a scientific research project in connection with their proposed seismic survey in order to ensure that subtle effects of seismic sound on sea otters would not go undetected if they occurred. The U.S. Fish and Wildlife Service viewed this study as having significant implications for sea otter recovery in light of the fact that seismic surveys are frequently proposed within the sea otter's range (in California, Alaska, and elsewhere). Although available evidence indicates that sea otters are relatively undisturbed by seismic sound, the U.S. Fish and Wildlife Service was concerned that the standard ship-based visual monitoring methods that are usually proposed in connection with seismic surveys would be insufficient to detect potential long-term or subtle effects of seismic sound on behaviors that could ultimately affect sea otter survival and reproduction. As a result, the U.S. Fish and Wildlife Service requested that the U.S. Geological Survey design a study that would determine whether the seismic survey would negatively affect sea otters.

4) Why were sea otters captured when PG&E did not have an Incidental Harassment Authorization from the U.S. Fish and Wildlife Service and still lacked other permits that would have been required before its seismic survey could go forward?

The U.S. Fish and Wildlife Service received a request for an Incidental Harassment Authorization from PG&E in June 2012. A revised request was received in August 2012. The application was subsequently withdrawn by PG&E, and no such authorization was issued.

The U.S. Fish and Wildlife Service carefully considered the possibility that PG&E's proposed seismic survey would not receive the necessary approvals and whether a research project on sea otters in this area would be warranted even if the seismic survey did not occur. Although the seismic survey did not ultimately go forward (and there is no currently active application to conduct such a survey in the future), the U.S. Fish and Wildlife Service determined—before any captures of sea otters were initiated—that conducting a study on sea otters in this area would be appropriate and useful in helping us understand the various stressors that are slowing the recovery of the southern sea otter population. The monitoring of marked (or otherwise identifiable) individuals is important for any study of wild animals that attempts to establish a causal relationship between an environmental input and potential harm. Given the necessity that sea otters would have to be protected in the event that the seismic survey occurred and the conservation benefit of knowledge that would be gained even if the seismic survey did not go forward, the U.S. Fish and Wildlife Service determined that it was in the best interest of sea otter conservation to initiate a research project.

5) How will sea otter research in this area benefit sea otter recovery?

The southern sea otter is listed as a threatened species under the federal Endangered Species Act. Field studies of sea otter behavior and natural history provide much-needed science that will contribute to recovery. A research project in this portion of the range is important to sea otter recovery because of three factors that influence mortality rates and hence recovery: shark bites, food-limitation, and human inputs into the marine environment.

The proportion of sea otter deaths attributable to white shark bites has increased dramatically over the past five years (<http://www.werc.usgs.gov/seaottercount>). Much of this increased shark-related mortality has occurred in the southern part of the range, specifically in the area between Estero Bay and Pismo Beach. In this area, shark-related mortality has risen from approximately 6 percent of the recovered cases up through 1990 to approximately 30 percent since 2001 (<http://seaotters.com/2012/03/24/sea-otter-mortality-from-white-sharks-in-california/>). The reasons for the increase in shark bite mortality are unknown.

Additionally, it has become apparent in recent years from comparative analyses, including a 3-year study off the coastlines of Monterey and Big Sur, that per-capita food limitation in long-established portions of the sea otter range interacts synergistically with other factors, such as anthropogenic (produced by humans) stressors, to increase mortality rates. Unlike the sea otters along the longer-occupied coastlines off Big Sur and Monterey, the sea otters in this more southerly portion of the range may not be food limited. However, they are exposed to many of the same human inputs into the marine environment that sea otters off Monterey are exposed to, and thus they provide an important benchmark against which to compare sea otters in other areas.

Understanding the dynamics of this portion of the population will help us understand better which factors are hindering sea otter recovery throughout the range and how they might be addressed.

6) Why wasn't the U.S. Geological Survey required to immediately remove the tracking devices from sea otters when the Coastal Commission denied PG&E's coastal permit application to conduct the seismic survey?

As noted under Question 4, the current research project is now independent of PG&E's proposed seismic survey. Recaptures of the study animals to remove tracking devices will occur within approximately two years, following the same protocol used in studies of other sea otter populations elsewhere in their range. It is not in the interest of sea otter conservation to remove the tracking devices immediately. Immediate removal would ultimately impose the same amount of stress on the study animals (each animal would experience two events of capture, sedation, and handling), and it would deprive scientists of valuable information regarding the exposure of individuals to various stressors in the marine environment that are affecting their survival and influencing the recovery of the species.

7) Have any study animals died as a result of this research project?

No sea otters have died as a result of this research. Researchers have, however, documented the first mortality of a study animal. During the week of December 31, the sea otter tracking team found a sub-adult female stranded alive, along a remote section of coast, with acute shark-bite injuries. The sea otter was recovered and transported to a rehabilitation facility for evaluation and care. Because the animal was suffering and was too severely injured to be rehabilitated, she was humanely euthanized by the attending veterinarian. A necropsy by a veterinary pathologist at the California Department of Fish and Wildlife confirmed that the cause of death was an encounter with a great white shark. The bite wounds caused severe damage to the muscles of the chest wall and significant resulting blood loss. Because this sea otter was tagged with a tracking device, the field monitoring team was able to locate her soon after she stranded onshore and to spare her the prolonged suffering that she would have otherwise likely endured.

8) What have researchers learned so far by monitoring the study animals?

Daily tracking and observation of the study animals began immediately after their capture, and routine monitoring will continue for the duration of the study. Additionally, during intensive, focal-animal activity monitoring sessions, researchers are collecting detailed behavioral data from study animals to measure activity-time budgets. During these 12-hour sessions, data are recorded at 10-minute intervals on the individual's activity state, diet, dive behavior, and habitat use. Whenever study animals feed during these activity sessions, continuous data are recorded on dive/surface intervals, prey identity, capture rates, and prey handling times. Knowing dive behavior (including dive depth) and diet/prey selection can help in determining habitat-specific risks of exposure to pollutants or pathogens. Identifying the specific areas used by particular animals for foraging or resting can also help us understand which factors, if any, may expose sea otters to a higher risk of fatal shark bites. If any of the factors predisposing sea otters to shark-related mortality are human-caused, knowing the individual habits of particular sea otters will

help us connect cause with effect and identify possible mitigation or management actions. As in other portions of the sea otters' range where animals have been tagged and tracked, researchers will learn more about their behavior and their response to environmental stressors the longer they are able to monitor the animals.