COASTAL CONSERVANCY

Staff Recommendation
December 3, 2009

SEA OTTER RECOVERY PROJECT
COASTAL CONTAMINANTS AND ANTHROPOGENIC STRESSORS STUDY
PHASE II

Project No. 08-079-02
Project Manager: Neal Fishman

RECOMMENDED ACTION: Consideration and possible authorization to provide up to $94,250 to the Regents of the University of California, Santa Cruz Campus, to undertake Phase II of a study to identify the impacts of coastal contaminants and anthropogenic stressors on southern sea otter recovery

LOCATION: Southern Monterey Bay and near shore waters off the Big Sur coast, Monterey County, California (Exhibit 1: Project Location and Site Photographs).

PROGRAM CATEGORY: Coastal and Marine Resources

EXHIBITS

Exhibit 1: Project Location and Sites

Exhibit 2: Study Photographs

Exhibit 3: Letter from California Department of Fish & Game

Exhibit 4: Letter from Regional Water Quality Control Board

Exhibit 3: Project Letters

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31220 *et seq.* of the Public Resources Code:

"The State Coastal Conservancy hereby authorizes the disbursement of up to ninety four thousand two hundred fifty dollars ($94,250) to the Regents of the University of California, Santa Cruz Campus (UCSC), to undertake Phase II of a study to identify the impacts of coastal contaminants and anthropogenic stressors on southern sea otter recovery, subject to the condition that, prior to the disbursement of any funds, UCSC shall submit for the review and written approval of the Executive Officer of the Conservancy a work program, including scope of work, budget and schedule."

Staff further recommends that the Conservancy adopt the following findings:

"Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed project is consistent with the current Project Selection Criteria and Guidelines.
2. The proposed authorization is consistent with the purposes and objectives of Chapter 5.5 of Division 21 of the Public Resources Code, regarding Coastal and Marine Resource Protection."

PROJECT SUMMARY:

This project is the second phase of a study investigating the impact of coastal contaminants and anthropogenic (human-caused) stressors on southern sea otters (also known as California sea otters) and to identify factors preventing population growth.

A subspecies of *Enhydra lutris*, the southern sea otter (*Enhydra lutris nereis*) once inhabited coastal waters from southern Oregon down into Baja. Hunted extensively for their luxuriant fur, by the early 20th century the historic population of approximately 16,000 animals was all but eliminated. Believed to be extinct, a small group of animals was re-discovered off the Big Sur coast in 1938. Since then, various protective measures, including the listing of the southern sea otter as threatened on the federal endangered species list, have been implemented, allowing the population to expand to about 2,700 animals. In recent years, however, population growth has stagnated, with no recorded increases since 2004. Numbers must expand to a minimum of 3,100 animals before resource agencies may consider removing the southern sea otter from the endangered species list, but available habitat could potentially support a population closer to that of historic levels.

The reasons for the stagnation of the southern sea otter population are unknown. To help identify factors that might be contributing to this phenomenon, and utilizing monies from the tax check-off Sea Otter Recovery Program, in September, 2008 the Conservancy approved a grant to UCSC to carry out a study focused on coastal contaminants and anthropogenic stressors that may be inhibiting population growth. Two study populations were identified, one in southern Monterey Bay, the other in near shore waters of Big Sur. These locations were selected to enable biologists to compare the health and condition of animals from relatively contaminated ocean waters where agricultural, industrial and residential land uses in the watershed are known to affect water quality (Monterey Bay), as opposed to those of more pristine waters where human activities in the watershed are more limited (Big Sur).

The first phase of the study has been completed (Exhibit 2: Study Photographs). It consisted of the capture and study of twenty-five sea otters from the Big Sur area, and thirty from Monterey Bay. The captures were conducted in the most sensitive manner possible, using scuba divers and nets. The animals were anesthetized and transported to the veterinary lab at UCSC where they were weighed and tagged. Tissue samples were taken and radio devises were implanted before the animals were returned to their home waters. The entire operation lasted only a few hours, minimizing stress on the otters.

Following release, the otters are tracked using state-of-the-art VHF telemetry equipment. GPS locations, survival and reproduction are recorded daily, and powerful scopes allow visual observations of diet and foraging behavior, detailed habitat use and activity patterns. To date, over 3,000 observations of Big Sur sea otters have been made, and about 2,500 of the Monterey Bay population. When radio transmitters signal mortality, the body is collected and analyzed to identify factors contributing to the animal's death, such as viruses, parasites, and/or chemical toxins.

Tissue samples taken during capture are evaluated to establish specific genetic bio-markers that are known indicators of lethal pathology. So far, the data has shown that there are a greater number of such bio-markers in the Monterey population than in Big Sur, an indication that more polluted waters are likely having a greater impact on sea otter disease and mortality. It has also been determined that females have a higher mortality rate than males, posing a significantly greater threat to reproductive success.

This project, the second phase of the study, will continue this work. Additional animals will be captured in each location including several of the original otters to monitor on-going health. Gene analyses will be completed for all otters to determine potential predictors for mortality. Blood and liver biopsies will be also conducted. A report will be prepared describing the results of the study and analysis, and suspected factors limiting population growth.

Data from the study will be available to resource managers to help develop policies conducive to sea otter population growth. Some of these may involve establishing specific water quality parameters; others may consist of translocations of sea otters to other parts of the central coast where suitable habitat is not currently occupied.

As a sentinel species in the marine food chain, sea otters reflect the overall health of the environment they inhabit. While the primary focus of the study is the support of a more vigorous sea otter recovery, it is likely that any management strategies developed as the result of this study will improve the overall marine environment of California's central coast.

UCSC operates the Long Marine Lab and will continue to utilize this resource for data analyses and other aspects of the study. The study team consists of experts in ecology, evolutionary biology and marine wildlife and includes researchers from both U.C. Santa Cruz and U.C. Davis, as well as the Department of Fish & Game, the U.S. Geological Survey and the Monterey Bay Aquarium.

Site Description: Although historically ranging all the way from Oregon to Baja, southern sea otters are currently found only from Pt. Conception in Santa Barbara County to just below Half Moon Bay in San Mateo County. Inhabiting rocky, sandy, and mixed shores, they are most

common in near shore areas with large kelp beds. They are generally found in water depths of sixty-five feet or less, facilitating foraging along the ocean floor.

For purposes of this study, animals from two central coast populations will be captured, one in the waters of southern Monterey Bay, the other off shore of Big Sur. To a large extent, water quality in each area reflects on shore land uses, with the watershed of Monterey Bay more intensively developed than the Big Sur coast. Agricultural uses in the Bay watershed consist of both irrigated crops and livestock operations, contributing fertilizer, pesticides, eroded sediments and animal waste to run-off. Residential and commercial development in and around the City of Monterey and other towns contributes run-off from streets and other hard surfaces, as well as eroded sediments from construction sites. The Big Sur landscape is substantially more rural, with the predominant land use being large cattle ranches and expansive public lands, and off-shore pollutants are less prevalent.

Project History: Southern sea otter recovery has been an important issue ever since the unexpected discovery of about fifty animals off shore of Big Sur in 1938. Formerly considered extinct as the result of relentless pursuit by fur traders, in the last several decades southern sea otters have been the focus of numerous protective measures, most importantly the Marine Mammal Protection Act of 1972 and the listing of the animal as threatened under the federal endangered species list in 1977. In 1982, the U.S. Fish & Wildlife Service (USFWS) released a southern sea otter recovery plan, anticipating that the population could eventually reach 13,000 animals, close to the 16,000 animals that once inhabited off-shore waters from southern Oregon to northern Baja.

As anticipated, southern sea otters rebounded once regulations were in place. By the mid part of the present decade, the population had reached 2,700 animals, and resource agencies believed numbers would soon expand to at least 3,100, the number required to be considered for de-listing. Then, in 2004, growth of the sea otter population unexpectedly ceased, remaining stagnant ever since.

In 2006, the California legislature approved AB 2485 which, among other provisions, creates the California sea otter tax check-off fund, allowing taxpayers to easily designate monies to fund sea otter recovery. Responding to increased concerns about population stagnation, and aware that studies had identified various pathogens resulting from on-shore human activities as potentially responsible for early mortality, in September, 2008, the Conservancy funded a UCSC-initiated study to evaluate the impact of coastal contaminants and anthropogenic stressors on the sea otter. This study is the first of its kind to compare data collected from otters that inhabit two separate marine environments, one relatively more polluted than the other.

To date, UCSC biologists have studied fifty-five sea otters from Monterey Bay and Big Sur, recovered tissue samples and blood, and implanted the animals with radio transmitters to allow tracking following release. The second phase of the study, the subject of this staff recommendation, will continue this work using newly captured animals. A report detailing the results of the study and analysis will be made available to resource agencies, most importantly, the U.S. Fish & Wildlife Service and the Regional Water Quality Control Board, to allow the development of measures to enhance water quality and expand the sea otter population.

PROJECT FINANCING

Coastal Conservancy:		
Phase II (this project)	**$94,250**	
Phase I	**224,980**	**$319,230**
Other Funders (Phases I & II):		
U.S. Geological Survey	**180,000**	
Department of Fish & Game	**100,000**	
Monterey Bay Aquarium	**220,000**	
U.C. Davis	**25,000**	**$525,000**
TOTAL PROJECT COSTS:		**$844,230**

The anticipated source of Conservancy funds for this project is the fiscal year 2009-2010 appropriation from the California Sea Otter Fund. Established in 2006, the California Sea Otter Fund is an income tax check-off program allowing taxpayers to dedicate funds to facilitate sea otter recovery. The funds may be used for research and programs related to improving the near-shore ocean ecosystem, including, but not limited to program activities to reduce sea otter mortality. Funds may also be used to address pathogens that may be harming sea otters, as well as water treatment technologies. (Revenue & Tax Code Section 18752(c)). This project is consistent with the requirements of the California Sea Otter Fund in that it will focus on the impact of contaminants and other anthropogenic stressors on southern sea otters in order to identify management strategies to counter such impacts.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

This project would be undertaken consistent with Division 21, Chapter 5.5 (Coastal and Marine Resources) of the Conservancy's enabling legislation (California Public Resources Code Section 31220).

Pursuant to Section 31220, the Conservancy may award grants to public agencies for the purpose of undertaking coastal and marine water quality projects. Under Section 31220 of the Public Resources Code, the Conservancy may undertake water quality and living marine resource protection projects that meet any of the objectives specified in subsection (b) of that section. Consistent with Section 31220(b)(5), the proposed project will provide for monitoring of marine wildlife to facilitate the protection and enhancement of resources within the coastal zone. The watersheds of Monterey Bay and Big Sur are within the coastal zone. Also consistent with this section, the project will result in the completion of a study to identify impacts of contaminants and anthropogenic stressors on sea otter health and mortality with the goal of reducing such impacts.

The Department of Fish and Game (CDFG) has been consulted with regard to this project, as

required by Section 31220(b)(5) and concurs that the study and resulting data analysis will inform specific conservation-action recommendations related to sea otter population growth and ocean health (Exhibit 3: Letter from CDFG). Additionally,CDFG has entered into a Memorandum of Understanding with UCSC permitting research on this state species of special concern.

As required by 31220 (a) and (c) the project is consistent with adopted state and regional watershed plans as described below under "Consistency with Local Watershed Management Plan/State Water Quality Control Plan." Conservancy staff has consulted with the State Water Resources Control Board (RWQCB) in the development of this project in order to ensure consistency with the Clean Beaches Program under Chapter 3 of Division 20.4 of the Public Resources Code (See Exhibit 4: Letter from RWQCB).

CONSISTENCY WITH CONSERVANCY'S 2007 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):

Consistent with **Goal 6, Objective 6A** of the Conservancy's 2007 Strategic Plan, the proposed project will result in the completion of a study to evaluate the effect of nonpoint source pollutants on sea otter health and mortality to enable informed planning for watershed improvements that will contribute to sea otter recovery.

CONSISTENCY WITH CONSERVANCY'S PROJECT SELECTION CRITERIA & GUIDELINES:

The proposed project is consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated on June 4, 2009, in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.
2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.
3. **Support of the public:** This project is supported by the University of California, Congressman Sam Farr, Assemblymen Dave Jones, the Marine Mammal Commission, the California Regional Water Quality Control Board, the Department of Fish & Game, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, Monterey Bay Aquarium, Defenders of Wildlife, the Ocean Public Trust Initiative, Friends of the Sea Otter, and the Central Coast Long-Term Environmental Assessment Network. Project letters are attached as Exhibit 5.
4. **Location:** The study area is offshore within southern Monterey Bay and Big Sur, Monterey County. Both the watersheds of Monterey Bay and Big Sur are within the Coastal Zone.

5. **Need:** Funds for this project will be derived from monies appropriated to the Conservancy from the Sea Otter Recovery Fund, as well as many other supporters. On its own, UCSC does not have sufficient funds to undertake this study.
6. **Greater-than-local interest:** The southern sea otter is a federally listed threatened species. Like all threatened and endangered species, the otter's recovery is of great significance, both from a biological and cultural perspective. As a sentinel species in the food chain, the sea otter is a measure of the entire marine ecosystem. Thus, sea otter recovery is an important component of marine resource restoration and protection overall. Additionally, because of its preferred habitat in near shore kelp beds, and its habit of feeding on the surface of the water, the sea otter is highly visible from the shore. Wildlife viewing opportunities such as this attract millions of tourists. The southern sea otter exhibit at the Monterey Bay Aquarium is one of the most popular in the facility, revealing the high level of public interest in this animal.
7. **Sea level rise vulnerability:** The project is a research project that will not be affected by sea level rise considerations.

Additional Criteria

8. **Urgency:** The southern sea otter is not rebounding to levels once anticipated by resource agencies, making it the subject of great concern. If current trends continue, full recovery will be jeopardized. This study is an important step in determining the cause of sea otter population stagnation.
9. **Leverage:** See the "Project Financing" section above.
10. **Innovation:** A side-by-side comparison of the health of two California sea otter populations, one in a relatively clean environment, the other in a more contaminated one, has never been undertaken before. Using state of the art monitoring technology, UCSC biologists will examine sea otter health at an unprecedented level of detail.
11. **Readiness:** UCSC and other team members are ready to move forward with the second phase of this study. All necessary permits have been obtained.
12. **Cooperation:** This project is a cooperative effort between many resource agencies and organizations focusing on sea otter health and recovery.
13. **Minimization of greenhouse gas emissions:** This research project is not expected to have any long term green house gas emissions. The project has the potential to generate short-term greenhouse gas emissions associated with vehicles used by commuting research workers and trucks hauling equipment that would generate and emit exhaust emissions, but these emissions would be limited, and not cumulatively significant.

CONSISTENCY WITH LOCAL WATERSHED MANAGEMENT PLAN/ STATE WATER QUALITY CONTROL PLAN:

In a letter dated Mary 15, 2008, Roger Briggs, Executive Officer of the California Regional Water Quality Control Board, Central Coast Region, states: "The information gained from [a study of the consequences of coastal contamination and anthropogenic stressors for sea otter

recovery]…will undoubtedly advance our understanding of threats impacting ocean health and provide science-based solutions for proper stewardship of our oceans. The Central Coast Regional Water Quality Control Board is charged with regulating sources of discharge to surface and ground water in the Central Coast. The proposed research activities will help us understand how best to regulate discharges in a way that will reduce impacts of these stressors to marine mammals and to protect the overall health of ocean waters…. The proposed project will provide important data for making wise decisions associated with regulatory and management programs for protection of water quality." Data gathered from this study will be used to inform plans addressing nonpoint source contaminants in central coast marine environments. (Exhibit 4: Letter from RWQCB)

COMPLIANCE WITH CEQA:

The proposed project is categorically exempt from review under the California Environmental Quality Act (CEQA) pursuant to 14 California Code of Regulations § 15306, which exempts basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious major disturbance to an environmental resource as part of a study leading to an action which the Conservancy has not yet approved, adopted or funded. This project will not result in a major disturbance to sea otters as evidenced by the review process outlined below.

Although the southern sea otter is a federally listed threatened species, the relevant regulatory agencies have determined that this research study will not result in a serious major disturbance to the animal; and thus the exception to Category 6 exemptions such as 14 Cal Code Regs. § 15306, does not apply in this case. The wildlife agencies have approved all necessary permits for the project to proceed. Specifically, the U.S. Fish & Wildlife Service has issued a "Recovery Permit" for this study, which allows the capturing, handling, instrumentation, bio-sampling and observation of wild sea otters. The USFWS considers the permit issuance to qualify for a categorical exclusion under the National Environmental Protection Act, per Department of Interior Guidelines. Upon approval, staff will file a Notice of Exemption for this project.