

COASTAL CONSERVANCY

Staff Recommendation
November 10, 2011

ALAMITOS BAY OYSTER RESTORATION PROJECT

Project No. 11-058-01
Project Manager: Megan Cooper

RECOMMENDED ACTION: Authorization to disburse up to \$89,100 to California State University Fullerton Auxiliary Service Corporation to conduct native oyster restoration and monitoring using community volunteers in the Jack Dunster Marine Reserve in Alamitos Bay.

LOCATION: Jack Dunster Marine Reserve, Alamitos Bay, City of Long Beach

PROGRAM CATEGORY: Resource Enhancement

EXHIBITS

Exhibit 1: [Project Location and Site Maps](#)

Exhibit 2: [Photos of Project Elements](#)

Exhibit 3: [Project Support Letters](#)

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31251-31270 of the Public Resources Code:

"The State Coastal Conservancy hereby authorizes the disbursement of an amount not to exceed \$89,100 to California State University Fullerton Auxiliary Service Corporation to conduct native oyster restoration and monitoring using community volunteers in the Jack Dunster Marine Reserve in Alamitos Bay. Prior to the disbursement of any funds, California State University Fullerton Auxiliary Service Corporation shall submit for the review and written approval of the Conservancy's Executive Officer a work program, budget, schedule, and the names of any contractors to be employed in carrying out the work."

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 6 of Division 21 of the Public Resources Code, regarding enhancement of coastal resources.

3. The project area is identified by the City of Long Beach's Local Coastal Program as requiring public action to resolve existing resource protection problems.
 4. California State University Fullerton Auxiliary Service Corporation is a nonprofit organization existing under Section 501(c)(3) of the United States Internal Revenue Code and whose purposes are consistent with Division 21 of the Public Resources Code."
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PROJECT SUMMARY:

Staff recommends that the Conservancy authorize the disbursement of up to \$89,100 to California State University Fullerton Auxiliary Service Corporation for the Alamitos Bay Native Oyster Restoration Project ("Project"). The Project will restore approximately sixty square meters of Olympia oyster (*Ostrea lurida*) in Alamitos Bay (Exhibit 1), will monitor success of the restoration effort, and will engage the community in the implementation of the Project. The Conservancy's contribution will pay for materials, equipment, permitting, and the grantee's costs and expenses in implementing the project

California State University Fullerton Auxiliary Service Corporation (ASC) is a 501(c)(3) nonprofit organization formed to "promote and assist the educational programs of the California State University, Fullerton." In fulfilling its mission, the ASC employs over 1,600 people as it performs a variety of services throughout the campus community. Specifically, it oversees commercial operations and educational grants and contracts for the California State University Fullerton.

The Project will be collaboration between scientists at California State University Fullerton (CSUF) and California State University Long Beach, who have managed several successful ecological restoration and research projects, KZO Education, a 501(c)(3) nonprofit that has delivered rich media education and training technologies and services for the past decade, and Orange County Coastkeeper (OCCK), a non-profit organization, founded in 1999, whose long-term goal is to protect and preserve all of Orange County's water bodies and restore them to healthy, fully functioning systems that will protect recreational uses and aquatic life.

The Olympia oyster is the only native oyster species on the West Coast of the United States. It was once widely distributed in California bays and was an important food source for California Indians. A century ago, natural populations were depleted due to a combination of over-harvesting, dredging, pollution, and filling and draining of wetlands. Oysters have been long recognized as an especially important component of a healthy and resilient estuarine ecosystem because of the myriad ecosystem benefits they provide. This includes providing structured habitat in the form of both refuge and hard substrate for a whole community of organisms, stabilizing sediments, and improving water quality and/or clarity, which can facilitate seagrass bed recovery. However, until recently, the Olympia oyster has been relatively understudied in Southern California, despite ongoing restoration efforts in Washington, Oregon and in Northern California.

Historic documents indicate the presence of oyster beds in several Southern California estuaries, including Mugu Lagoon, Newport Bay and Alamitos Bay that supported artisanal-scale harvesting and small-scale fishery operations for at least a few decades. Preliminary field surveys of Alamitos Bay in spring and summer 2010 revealed that native oysters are present, but there are no natural intertidal “beds” of oysters. Native oysters in Alamitos Bay are regularly reproducing and recruiting to local populations but suitable settlement habitat in the form of an oyster bed is lacking. Thus, augmentation of habitat appears to be the most logical first step in restoration step. The hypothesis that augmentation of habitat will increase local oyster density is supported by preliminary findings from a restoration project already underway in nearby Newport Bay, CA.

The Project will augment suitable habitat by building a 60 square meter oyster bed using dead oyster shell that has been recruited by native oyster spat. These oyster shells have been out of water for at least six months ensuring that we will not introduce any living foreign organisms into Alamitos Bay. The Project, while modest in size, offers much more than acres of habitat restored. The public will participate in the project through “oyster gardening” where, following a workshop and training session, community members will hang strings of oyster shell off of private or public docks around Alamitos Bay throughout the summers of 2012 and 2013. These oyster strings will collect native oyster recruits for a 30-45 day grow-out phase (Exhibit 2). Following the recruitment period, the volunteers will attend a volunteer day where they will place the shells with recruited spat, removed from their strings, onto the mudflat, at least two meters above the edge of any existing eelgrass (*Zostera marina*) to create the new oyster reef (Exhibit 2). Prior to the first outplanting, they will spread a thin layer of dead shell (~4 cm deep) onto the mudflat that will serve as a platform upon which to spread the volunteer shells. Over the summers of 2012 and 2013, the bed will accumulate more shells up to a maximum dimension of 30 X 2 square meters to a depth of about 12 cm. The total volume of shell material added, given the above measurements, will be 9.4 cubic yards and will cover 0.015 acres of mudflat. By engaging the community and advancing education in substantial ways, the Project will generate interest and excitement among citizen, agency, and government stakeholders, which will act as a catalyst for further expansion of restoration efforts throughout southern California.

Monitoring of the project and control sites will occur prior to, during, and following construction of the oyster bed. Project scientists will conduct a pre-project census of the target and control plots using point-sample and quadrant survey techniques to assess habitat type and oyster density. To provide reference conditions for comparison, scientists will conduct oyster density, size frequency distribution and habitat type surveys at six additional sites throughout Alamitos Bay. Following initial construction of the bed, the grantee will monitor oyster density, survivorship and growth of recruits on the constructed bed relative to the control plots from September to April each year until 2014.

In addition to monitoring oyster recruitment, they will also examine the effects on biodiversity of the habitat by sampling the community structure of all invertebrates (including oysters) inside and outside of experimental plots and control plots. Monitoring of community structure will also include quantifying oyster settlement onto nearby eelgrass shoots and monitoring changes in eelgrass biomass both adjacent to the constructed bed and at a nearby control site. In addition, they will map the shallow edge of the eelgrass bed in the vicinity of the oyster restoration project

and visually present this on a map with the location of the oyster restoration reefs during each of the community monitoring surveys. They will also monitor shell attrition and reef architecture by measuring bed depth, tidal height, shell cover, deposition of mud onto the bed, and total surface area of the bed. In addition to measurements of biological factors, the grantee will take basic measurements of water quality including temperature, water clarity, and dissolved oxygen prior to, during, and after construction. All monitoring other than the oyster recruitment monitoring will occur at 0, 6, 12, 18 and 24 months following construction of the oyster reef. After the first two years of surveys every 6 months, they will conduct the surveys on a yearly basis for three years.

In addition to the community outreach component of the Project associated with oyster bed construction, KZO and OCCK will contribute to community awareness and education. KZO will develop a comprehensive website that will serve as an awareness and recruitment tool, as a research and training platform for both the Newport and Alamitos Bay projects, and will inform local volunteers, citizens, regulatory agencies and other interested parties about recent findings and restoration progress.

OCCK will design a comprehensive curriculum implementing California Science Content Standards for grades K-12 and, through in-class presentations and field trips (12 per year, each – approximately 45 students per presentation or trip) to the Jack Dunster Marine Reserve, will introduce students to the pivotal role of filter feeders for improving water quality in our coastal waters and to the ecosystem-engineering role of oysters and other emergent bivalves. For the presentation and fieldtrips, OCCK will work with project partners to design and construct a floating filter feeder lab at Jack Dunster Marine Reserve. The purpose of this lab would be to demonstrate how bivalves are able to filter water, aiding in the removal of excess nutrients and other pollutants from the water.

The filter feeder lab will be a floating cube-shaped cage built using a PVC frame, mesh aquaculture netting and fitted with line float buoys along the top (Exhibit 2). The cage will be filled with a locally collected combination of bay mussels and Olympia oysters and secured to the floating dock on the perimeter of the Jack Dunster Marine Reserve. When needed for educational activities, the cage will be removed from the water and placed into a portable acrylic aquarium on the dock and filled with bay water. The filter feeder demonstration will include adding particulates to the aquarium to increase turbidity and, after a period of time, observing how the bivalves have removed most of the suspended particles and how the water will again appear “clear.” OCCK will also assist project scientists in the design and construction of an interpretive sign to be placed within Jack Dunster Marine Reserve. The sign will describe the biology, history, and importance of oysters in Alamitos Bay, as well as the role of other filter feeders in healthy bays and estuaries.

Site Description:

Alamitos Bay is located within the City of Long Beach and was historically part of the greater Los Cerritos Wetlands (Exhibit 1). The Los Cerritos Wetlands once encompassed 2,400 acres of habitat, but has been significantly altered since the land was developed in the late 19th century.

The wetland habitats remaining in Alamitos Bay include the 13-acre Colorado Lagoon and the 44-acre Los Cerritos Wetlands, as well as the mitigated wetland of Jack Dunster Marine Reserve on 2.4 acres of land.

Jack Dunster Marine Reserve was selected as the target location because it offers educational opportunities to the public, yet provides mudflat habitat in a protected area with no public access. The public can observe the community bed during low tides via access to a meandering pathway throughout the reserve, as well as gangway access to two floating observation platforms and one floating dock. The site is protected from the potentially erosive currents and boat wakes in the Los Cerritos Channel by a floating breakwater.

Project History: The Project was added to the Southern California Wetlands Recovery Project Work Plan on September 7, 2011. The Work Plan provides a prioritized list of wetland and marine restoration projects for southern California that have been vetted by a panel of 19 resource and regulatory agencies.

PROJECT FINANCING

<u>Coastal Conservancy</u>	89,100
Total Project Costs	89,100

The anticipated source of Conservancy funds is a grant awarded to the Conservancy in 2010 from the NOAA Coastal and Marine Habitat Restoration National and Regional Partnership Grant Program. The funds from this Partnership program are dedicated to implementing qualified restoration projects listed on the Work Plan of the Southern California Wetlands Recovery Project that specifically protect and enhance NOAA Trust Resources. As noted in the Project History section, the proposed Project is on the Recovery Project's Work Plan. Restoration projects eligible for funding under NOAA's NOAA Coastal and Marine Habitat Restoration National and Regional Partnership Grant Program should "contribute to the return of degraded or altered marine, estuarine, coastal and freshwater. . .fish habitats to a close approximation of their condition prior to disturbance" and are expected to have "strong on-the-ground habitat restoration components that provide educational and social benefits for communities, in addition to long-term ecological habitat improvements for NOAA trust resources." The Project will restore a native oyster bed, a NOAA Trust Resource. The oyster bed will improve water clarity, which will improve conditions for eelgrass, another NOAA trust resource, and will provide habitat for invertebrates and the fish that forage on them. The Project will involve on-the-ground restoration and educational components.

The grantee will provide approximately \$56,000 of in-kind services. In-kind services will include donated hours from the principal investigator, volunteer hours, travel costs, materials, and supplies.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

This project will be undertaken pursuant to Chapter 6 of Division 21 of the Public Resources Code (Sections 31251-31270) regarding coastal resource enhancement projects. Consistent with Section 31251, the proposed authorization will award a grant to a nonprofit organization to implement corrective measures that will enhance coastal resources that have suffered loss of natural or scenic value due to natural or human-induced events. The proposed project will restore the natural character of oyster beds in Alamitos Bay by re-establishing populations that existed before they were impacted by over-harvesting, dredging, pollution, and filling and draining of wetlands.

Section 31252 states that all areas proposed for resource enhancement shall be identified in a certified local coastal plan or program as requiring public action to resolve existing or potential resource protection problems. The proposed project is consistent with the City of Long Beach's Local Coastal Program, as described in the "Consistency with Local Coastal Plan" section, below.

Consistent with Section 31253, staff has determined the recommended amount of funding by evaluating the total amount of funding available to the Conservancy for coastal resource enhancement projects, the fiscal resources of the applicant, the urgency of the project relative to other eligible similar projects, and the application of other factors prescribed by the Conservancy for the purpose of determining project eligibility and priority. The Conservancy's funding is appropriate at this time because the project's benefits to coastal habitat are significant, the funding source is dedicated to the restoration of NOAA Trust Resources, and the project's use of volunteers will provide added cost savings and an important public education component.

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

Consistent with **Goal 5, Objective B** of the Conservancy's 2007 Strategic Plan, the proposed project will restore approximately 0.015 acre of oyster habitat.

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:** The project is supported by elected officials, multiple community and nonprofit organizations, the City of Long Beach, and the County of Los Angeles (see Exhibit 3).
4. **Location:** The proposed project would be located within the coastal zone of the City of Long Beach, County of Los Angeles.
5. **Need:** The project will not proceed without Conservancy funding.
6. **Greater-than-local interest:** The project will restore native oysters, an Environmentally Sensitive Habitat Area recognized by the Coastal Commission as a resource of statewide importance and a NOAA Trust Resource of nationwide importance. Greater coverage of oysters in Alamitos Bay will improve water quality and increase the food base for migratory birds and commercially and recreationally important fish.
7. **Sea level rise vulnerability:** Oysters occupy a wide range of tidal heights and the oyster populations can easily adapt and shift inland as wetlands migrate inland due to sea level rise. However, if there is an overall net loss of wetland area due to sea level rise, we can expect a net loss in oyster habitat as well.

Additional Criteria

12. **Innovation:** The Project will employ innovative techniques for engaging the community in oyster restoration.
13. **Readiness:** The grantee has received all necessary permits and is ready to start the project in May 2012.
14. **Realization of prior Conservancy goals:** See “Project History” above.”
16. **Cooperation:** Multiple volunteers from the public, nonprofit organizations, academic institutions and consulting companies will contribute to the project.
17. **Vulnerability from climate change impacts other than sea level rise:** Oysters are adapted to a broad range of salinity, depth, and water temperature, and so are naturally buffered against many of the environmental shifts that might be associated with predicted climate change. In addition, oyster beds will help slow shoreline erosion as sea levels rise by stabilizing sediments and capturing sediments from the water column.
18. **Minimization of greenhouse gas emissions:** The project will have negligible contributions to greenhouse gas emissions because all work will be done by hand without the use of gas-powered equipment. Project participants will be encouraged to carpool whenever possible.

CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:

Alamitos Bay is designated as a “Waterland Community” in the City of Long Beach’s Local Coastal Program (LCP) (1980). The goal of the LCP (within the Resources Management Plan section) is to “improve and maintain water quality, to seek and establish a harmony between

public use of Waterlands and private use of surrounding urban areas, and to protect and enhance the viability of environmentally sensitive areas.” Current research has shown that native oyster populations require active management in order to recover. Thus, in order to protect the environmentally sensitive area of Alamitos Bay, the proposed project requires public action to resolve existing resource protection problems.

At the time the LCP was written, the City of Long Beach believed that Alamitos Bay was, “an apparently self-maintaining natural ecosystem”. However, in acknowledgement of a lack of information needed to manage the Bay, the LCP recommends, “A research project...to provide the technical information for managing the ecology of the Bay to balance best the allowed mix of human uses and ecosystem vitality.” The LCP further acknowledges that, “A healthy ecosystem enhances water quality.” Based on these policies, the proposed Project to investigate the ecology of Alamitos Bay and improve water quality by restoring the native oysters is consistent with the LCP.

COMPLIANCE WITH CEQA:

The proposed project is categorically exempt from review under the California Environmental Quality Act (CEQA). Pursuant to 14 Cal. Code of Regulations Section 15304(d), projects involving minor alterations in land, water, and vegetation on existing officially designated wildlife management areas or fish production facilities which result in improvement of habitat for fish and wildlife resources or greater fish production are categorically exempt. This oyster restoration project involves the restoring a small oyster bed in a marine reserve in order to improve fish and wildlife resources. Staff will file a Notice of Exemption upon approval.