

COASTAL CONSERVANCY

Staff Recommendation  
March 26, 2015

**SAN FRANCISCO BAY LIVING SHORELINES PROJECT**

File No. 10-010-01, 10-010-02  
Project Manager: Marilyn Latta

**RECOMMENDED ACTION:** Consideration and possible Conservancy authorization to disburse up to \$775,000, including \$475,000 in U.S. Fish and Wildlife Service grant funds, for three years of planning, design, implementation, and monitoring activities for the Phase Two Living Shorelines Project, involving seven demonstration projects and a one acre pilot project in the San Francisco Estuary (Alameda, Contra Costa, Marin, San Mateo, and Santa Clara counties) and for an additional year of monitoring at the Living Shorelines Project site on the San Rafael shoreline (Marin County).

**LOCATION:** One existing site in San Francisco Bay on the San Rafael Shoreline in Marin County; and seven additional sites, one of which will be the site of a pilot project: Breuner Marsh (Contra Costa County); San Rafael Shoreline (Marin County); Elsie Roemer Marsh, Eden Landing Ecological Reserve (Alameda County); Ravenswood Salt Ponds/Slough (Santa Clara County); and Coyote Point and Oyster Point (San Mateo County).

**PROGRAM CATEGORY:** San Francisco Bay Area Conservancy

---

**EXHIBITS**

- Exhibit 1: [Project Location and Site Map](#)
  - Exhibit 2: [December 5, 2013 Staff Recommendation](#)
  - Exhibit 3: [Project Letters](#)
- 

**RESOLUTION AND FINDINGS:**

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31160 through 31165 of the Public Resources Code:

“The State Coastal Conservancy authorizes disbursement of up to \$775,000 (seven hundred seventy five thousand dollars), including \$475,000 (four hundred seventy five thousand dollars) of U.S. Fish and Wildlife Service grant funds, to implement the Living Shorelines Project (LSP) in San Francisco Bay as follows:

1. Up to \$100,000 in Conservancy funds to conduct 2015 monitoring for the current LSP demonstration project at the San Rafael Shoreline site in Marin County.
-

2. Up to \$675,000 (six hundred seventy five thousand dollars), including \$475,000 (four hundred seventy five thousand dollars) in U.S. Fish and Wildlife Service grant funds, to design, implement, and monitor additional demonstration Phase Two LSP demonstration projects at seven candidate sites in San Francisco Bay, including Breuner Marsh (Contra Costa County); San Rafael Shoreline (Marin County); Elsie Roemer Marsh and Eden Landing Ecological Reserve (Alameda County); Ravenswood Salt Ponds/Slough (Santa Clara County); and Coyote Point and Oyster Point (San Mateo County). One of these candidate sites will be selected for implementation of a one acre pilot project. These funds may be used to retain environmental services contractors needed to design or monitor the Living Shorelines projects, or to augment existing grants to nonprofit organizations and public entities or to provide new grants to such organizations or entities. Use of the funds shall be subject to the following conditions:
  - a. If the grant is to a nonprofit organization, the grantee is a nonprofit organization existing under Section 501(c)(3) of the United States Internal Revenue Code, whose purposes are consistent with Division 21 of the California Public Resources Code.
  - b. Prior to initiating any project work and prior to disbursement of any funds, each grantee shall submit for review and approval of the Executive Officer:
    - i. A plan detailing the proposed project work, including a work program, schedule and budget.
    - ii. Documentation that all permits and approvals needed for the project work have been obtained.
  - c. In carrying out any monitoring, implementation or other work, the grantee or contractor shall comply with all applicable mitigation and monitoring measures that are that are required by any permit or approval for the project.”

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 remains consistent with Chapter 4.5 of Division 21 of the Public Resources Code, regarding the resource goals of the San Francisco Bay Area Conservancy Program.
2. The proposed project remains consistent with the Project Selection Criteria and Guidelines adopted on October 2, 2014.
3. The California Wildlife Foundation, a potential grantee, 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 California Public Resources Code.”

**PROJECT SUMMARY:**

The multi-habitat Living Shorelines Project (LSP) integrates subtidal habitat restoration of native oyster and native eelgrass beds with designs that test the use of natural structures to buffer and protect adjacent tidal wetland sites, and areas of the San Francisco Bay shoreline vulnerable to sea level rise and shoreline erosion. At the August 5, 2010, December 2, 2010, March 29, 2012, and December 5, 2013 meetings, the Conservancy approved funding in the cumulative amount of \$1,750,000: \$750,000 of Conservancy funds, \$700,000 of Wildlife Conservation Board (WCB) grant funds to the Conservancy, and \$300,000 of U.S. Environmental Protection Agency (EPA) funds, granted to the Conservancy through the Association of Bay Area Governments (ABAG). These funds have been utilized to conduct planning, site selection, final project and monitoring design, construction of LSP demonstration projects at two sites and post-construction monitoring of those projects.

As now proposed, the LSP funding will be increased for two purposes. First, staff proposes an additional disbursement of up to \$100,000 for ongoing monitoring at the existing LSP location on the San Rafael Shoreline in Marin County. This monitoring is required by the San Francisco Bay Conservation and Development Commission (BCDC) permit for the project and is essential to evaluating the effectiveness of the pilot Living Shorelines sites, prior to construction of larger-scale LSP demonstration projects in San Francisco Bay. The proposed monitoring will be undertaken by San Francisco State University and environmental services contractors retained by the Conservancy.

Second, staff proposes the authorization of an additional disbursement of up to six hundred seventy five thousand dollars (\$475,000 in USFWS grant funds, and \$200,000 in Conservancy funds) in order to fund the design, implementation, and monitoring of a Phase 2 LSP demonstration project to be conducted at one site that will be selected from seven candidate sites in San Francisco Bay. The candidate sites include: Breuner Marsh (Contra Costa County); San Rafael Shoreline (Marin County); Elsie Roemer Marsh, Eden Landing Ecological Reserve (Alameda County); Ravenswood Salt Ponds/Slough (Santa Clara County); and Coyote Point and Oyster Point (San Mateo County). This work was generally anticipated in the original project, and Conservancy staff has secured additional federal funds through a U.S. Fish and Wildlife Service (FWS) North American Wetlands Conservation Act grant to conduct this work. These seven test plot sites and one final site chosen for the LSP pilot project will also incorporate a new approach of integrating subtidal reef (eelgrass vegetation) and intertidal reef (oyster bed installation) restoration with coastal wetland restoration, through the revegetation of the adjacent coastal wetland with native cordgrass and gumplum and other native plants. Not only does this dovetail with the ongoing Conservancy Invasive *Spartina* Project (ISP) and the efforts under the ISP to revegetate areas from which invasive *Spartina* has been removed, but it also serves to create integrated habitat to achieve multiple biological and physical benefits for the larger San Francisco Bay ecosystem.

The LSP is being coordinated by the Conservancy, in collaboration with biological and physical scientists at San Francisco State University (SFSU), the University of California at Davis, U.S. Geological Survey (USGS) Western Ecological Research Center, and environmental services consultants. In carrying out Phase Two LSP projects, the Conservancy will also coordinate with and utilize the expertise and experience of ISP grantees and environmental services consultants for the revegetation design and planning for the coastal habitat restoration portion of the work.

The original \$1,750,000 authorized for the LSP supported the development of draft and final design documents, permitting, construction and up to three years of post-construction monitoring. The Conservancy and its collaborators have made significant progress in completing the necessary project tasks. The project design and monitoring program design was completed in January 2012, and all necessary permits obtained for the project in July 2012. Construction occurred over a three week period in July-August 2012 at the two pilot sites. Monitoring of oyster and eelgrass success as well as a broad range of ecosystem services and species use monitoring has occurred on a bi-weekly to quarterly basis over the four years following construction. Preliminary results include the following impressive findings:

1. More than 3.8 million native oysters have settled onto the project-created oyster shell reefs at the San Rafael site, along with bay shrimp, Dungeness crabs, birds, fish, and many other species.
2. July 2014 monitoring data showed that eelgrass shoot densities are at ~120% of planted densities at the San Rafael site, suggesting eelgrass has now been well-established.
3. Fish trapping and fish seining results suggest that eelgrass presence increases the diversity or abundance of fish and invertebrates present on the oyster shell reefs.
4. A wave model was developed to quantify the change in wave energy under varying wave and water level conditions with and without the reef. Preliminary results show that while most energy is lost on the mudflats, the reef extracts 30-50% more energy than a mudflat at the same location.

The proposed funding for Phase 2 LSP builds on this work, and the successful native plant revegetation work for native *Spartina foliosa* and *Grindelia stricta* done in tidal marshes in the San Francisco Bay as part of the ISP.

The Conservancy staff has raised a total of \$1,500,000 in outside funds for the LSP projects to date and is currently continuing to fundraise for the remainder of project management and monitoring costs beyond this current proposed authorization. The total estimate of remaining funds needed is \$700,000, and Conservancy staff and project collaborators are submitting a variety of additional grant proposals this year.

**Project History:** As explained in the August 5, 2010, December 2, 2010, March 29, 2012, and December 5, 2013 staff recommendations, the LSP is part of a continuing effort by the Conservancy and the Ocean Protection Council (OPC) to promote long-term management and restoration of subtidal habitat, and pilot climate adaptation project approaches, in the San Francisco Bay. In June of 2005, the OPC authorized funds for San Francisco Bay eelgrass and native oyster projects, and in January of 2006, the OPC designated the *San Francisco Bay Subtidal Goals Project* as a high priority for ocean conservation and requested funding by the Conservancy to study and prepare a report identifying threats to the Bay ecosystem, and develop restoration and research priorities. The final report was completed in December of 2010.

The LSP and Phase Two LSP implement specific recommendations in the *Subtidal Habitat Goals Project* (2010) and the *San Francisco Baylands Ecosystem Habitat Goals Report* (1999). In addition, the forthcoming Climate Change Science Update to the *San Francisco Baylands Ecosystem Habitat Goals Report* will recommend the use of “living shorelines” techniques to achieve multiple objectives and ecosystem services while protecting shorelines from sea level rise and wave inundation.

**Site Description:**

The initial LSP work has been done at a location along a portion of the San Rafael shoreline on property owned by The Nature Conservancy. Phase Two LSP work will be conducted at seven candidate sites in San Francisco Bay including Breuner Marsh (Contra Costa County); San Rafael Shoreline (Marin County); Elsie Roemer Marsh, Eden Landing Ecological Reserve (Alameda County); Ravenswood Salt Ponds/Slough (Santa Clara County); and Coyote Point and Oyster Point (San Mateo County). One of these sites will be selected for a one acre implementation project. The locations for this work are all in the low intertidal to shallow subtidal habitats, adjacent to and offshore from existing shorelines and tidal marshes. The purpose of this work is to continue testing a combined habitat approach to climate adaptation by restoring habitat features that may enhance and protect adjacent shorelines from sea level rise and other climate changes by providing biological values (feeding, breeding, nesting) as well as physical values (wave attenuation, sediment stabilization).

See the Project Location and Site Map (Exhibit 1) for precise locations.

**PROJECT FINANCING:**

**Funding Sources:**

This authorization:

Conservancy	\$300,000
FWS North American Wetlands Conservation Act Grant	<u>\$475,000</u>
<b>Subtotal</b>	<b>\$775,000</b>

Previous authorizations:

Conservancy	\$750,000
Association of Bay Area Governments (EPA funds)	\$300,000
Wildlife Conservation Board	<u>\$700,000</u>
<b>Subtotal</b>	<b>\$1,750,000</b>

<b>Total</b>	<b>\$2,525,000</b>
--------------	--------------------

The anticipated source of Conservancy funds for this grant is the FY 2010 appropriation to the Conservancy from the “Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006” (Proposition 84). This funding source may be used for the protection of beaches, bays and coastal waters, including projects that protect and restore the natural habitat values of coastal waters, pursuant to the Conservancy’s enabling legislation, Division 21 of the Public Resources Code. The proposed project serves to restore the natural habitat values of the San Francisco Bay, by bringing back native eelgrass and oyster and associated natural habitats. Moreover, the proposed authorization includes funding specifically for monitoring, which is required as part of any restoration project funded by Proposition 84. In particular, Public Resources Code Section 75005 requires that Proposition 84 restoration projects include the planning, monitoring and reporting necessary to ensure successful implementation of the project objectives. Finally, as discussed below, the project is consistent

with Chapter 4.5 of the Conservancy's enabling legislation.

Proposition 84 also requires for restoration projects that protect natural resources that the Conservancy shall give priority to [restoration] projects that demonstrate one or more of the following characteristics specified in Section 75071(a)-(e). The proposed acquisition satisfies two of the specified criteria: consistent with 75071(a), the project creates subtidal habitat that provides linkages between the open bay and the shoreline; and consistent with 75071(e), the project is funded by non-state (FWS) matching contributions toward the habitat restoration.

Under the North American Wetlands Conservation Act (NAWCA) of 1989, FWS provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico for the benefit of wetlands-associated migratory birds and other wildlife, and involve long-term protection, restoration, and/or enhancement of wetlands and associated subtidal habitats. The total amount of FWS funding is \$500,000; up to \$475,000 will be used for project costs and up to \$25,000 will support Conservancy staff LSP project management.

**CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:**

As modified, the LSP remains consistent with Chapter 4.5, Sections 31160-31165, of Division 21 of the Public Resources Code regarding resource goals in the San Francisco Bay Area, as discussed in the August 5, 2010, December 2, 2010, March 29, 2012, and December 5, 2013 staff recommendations (Exhibit 2).

Under Section 31162(b), the Conservancy may undertake projects and award grants in the nine-county San Francisco Bay Area to achieve the goal of protecting, restoring and enhancing natural habitats of regional importance. Consistent with this section, the LSP consists of work that will result in sound scientific planning and restoration project implementation to help protect, restore and enhance subtidal habitats in an estuary of regional importance within the Bay Area.

Under Section 31163(a), the Conservancy is required to cooperate with BCDC, other regional government bodies, and other interested parties in identifying and adopting long-term resource goals for San Francisco Bay area. The LSP is part of a program of activities that came about from the collaborative planning of four primary agencies that developed the San Francisco Bay Subtidal Habitat Goals (Conservancy, BCDC, National Oceanic and Atmospheric Association (NOAA), and the San Francisco Estuary Partnership).

The LSP is appropriate for prioritization under the selection criteria set forth in Section 31163(c) in that: (1) it is consistent with San Francisco Bay Subtidal Habitat Goals report, the San Francisco Baylands Ecosystem Habitat Goals Report, and the San Francisco Bay Plan ("Bay Plan"), as described below; (2) it involves the coordination of environmental solutions across several different agencies and many different jurisdictions within the San Francisco Bay Area; (3) it will be implemented in a timely manner; (4) provides opportunities for benefits that could be lost if the project is not implemented quickly enough; and (5) includes matching funds from other sources of funding or assistance.

In addition, under Section 31165, the Conservancy may undertake projects and award grants for activities that are compatible with the preservation, restoration, or enhancement of ocean, coastal and bay resources. The proposed authorization will provide for monitoring that will serve as

critical background data for future, large scale Living Shorelines projects for habitat protection, restoration and enhancement projects involving subtidal habitats in the Bay.

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

Consistent with **Goal 11, Objective C** of the Conservancy's 2013-2018 Strategic Plan, funding of further LSP work will serve to "develop plans for enhancement of tidal wetlands...and subtidal habitat"

Consistent with **Goal 11 Objective D** of the Conservancy's 2013-2018 Strategic Plan, funding for the LSP will "enhance tidal wetlands... and subtidal habitat."

Consistent with **Goal 7, Objective D**, the LSP comprises implementation of a climate change adaptation pilot project that will test the role of living shorelines in reducing hazards from sea level rise and extreme storm events, while protecting natural resources and maximizing public benefits.

Consistent with **Goal 14, Objective B**, which encourages the Conservancy to develop projects so as to achieve annual funding targets, the LSP project work will be carried out in part with outside grants that allow reimbursement of Conservancy staffing costs.

**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 October 2, 2014, 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. Promotion and implementation of state plans and policies:** By and enhancing native tidal marsh and subtidal habitat species, the project serves to promote and implement several statewide plans and policies including:
  - **San Francisco Bay Water Quality Control Plan for the San Francisco Basin:** This document was developed by the regional water quality control board and identifies the protection, preservation, and restoration of the Bay's tidal marsh system as essential for maintaining the ecological integrity, and thus water quality, of the San Francisco Bay. The proposed Project will aid in achieving these goals. Project enhancements will aid in improving water quality of the San Francisco Bay by improving ecological connectivity and wetland function.
  - **San Francisco Bay Conservation and Development Commission's (BCDC) San Francisco Bay Plan:** The Central and South Bays are an integral component of this document that guides state regulation. The objectives of the plan are to protect the bay

as a great natural resource for the benefit of present and future generations and to develop the bay and its shoreline to its highest potential with a minimum of bay filling. The proposed projects will further the BCDC's objectives by enhancing marsh and subtidal habitats for the benefit of multiple species.

- **San Francisco Bay Subtidal Habitat Goals (2010) and Baylands Habitat Goals (1999, plus climate change update in prep):** Both Goals document recommend the restoration of native *Spartina* in the San Francisco Estuary in order to protect native biodiversity and ecosystem functions of mudflats, marshes, and associate upland habitats. The reports also recommend the restoration of native cordgrass and subtidal oyster and eelgrass habitats as part of a multi-objective habitat restoration approach to increased wave attenuation, sediment stabilization, and other climate adaptation benefits.
4. **Support of the public:** The LSP is supported by the NOAA Fisheries Restoration Center, BCDC, San Francisco Bay Joint Venture, and the San Francisco Estuary Partnership. The Project also has broad public support from non-governmental organizations such as Baykeeper and others. See Exhibit 3.
  5. **Location:** The LSP sites are located entirely within the nine counties that make up the San Francisco Bay Area, consistent with Section 31162 of the Public Resources Code.
  6. **Need:** The LSP would not occur without Conservancy participation and funding from USFWS, EPA and WCB.
  7. **Greater-than-local interest:** The LSP will help develop new approaches and new techniques for restoration of subtidal habitats in San Francisco Bay. The techniques and designs resulting from the Project may have applicability at other sites in San Francisco Bay and in other estuarine systems on the Pacific Coast.
  8. **Sea level rise vulnerability:** The LSP helps to improve resiliency of natural habitats, which is one of the overarching recommendations in climate change adaptation planning. The Project itself will not result in increased vulnerability to sea level rise.

#### **Additional Criteria**

9. **Urgency:** Without Conservancy and FWS involvement and prior EPA and WCB funding, the LSP would not occur at this time in San Francisco Bay.
10. **Resolution of more than one issue:** The LSP implements subtidal habitat restoration designs, tests pilot climate change adaptation techniques, and will result in lessons learned that can be applied to additional sites.
11. **Leverage:** The FWS and prior EPA and WCB grants help cover Conservancy staff time, maximizing leverage of staff resources with minimal Conservancy fiscal outlay.
12. **Conflict Resolution:** The LSP involves multiple stakeholders with diverse views, and includes testing of ecosystem services that helps to address data gaps in subtidal restoration and in climate change adaptation planning.
13. **Innovation:** The LSP is implementing recommendations in the San Francisco Bay Subtidal Habitat Goals Report and continues to build on new, innovative techniques with the San Francisco Bay Living Shorelines Project for restoration of subtidal habitats.

- 14. Readiness:** The LSP is ready to commence upon approval of disbursement of funding by the Conservancy.
- 15. Realization of prior Conservancy goals:** See “Project History” section above.
- 16. Cooperation:** The LSP is a collaborative project involving many agencies. The Conservancy is the lead agency, and supporting partners include The Nature Conservancy, the Wildlife Conservation Board, San Francisco State University, University of California at Davis, United States Geological Survey, and many others.
- 17. Minimization of Greenhouse Gas Emissions** The LSP incorporates measures to minimize emissions throughout implementation of the project. Work is completed by local staff, contractors, grantees, and community volunteers that live in close proximity to the project locations. Recommended regional construction best management practices have been followed. Materials and equipment used for the project has been purchased by local vendors where feasible.

**CONSISTENCY WITH SAN FRANCISCO BAY PLAN:**

The San Francisco Bay Plan (“Bay Plan”) was completed and adopted by BCDC in 1968 pursuant to the McAteer-Petris Act of 1965 and last amended in October 2011. The Bay Plan guides BCDC’s management and permitting decisions in the Bay. The Project is consistent with the following policies articulated in Part III, Findings and Policy Section of the Bay Plan:

Subtidal Areas Policy 5 (adopted April 2002): “The [BCDC] should continue to support and encourage expansion of scientific information on the Bay's subtidal areas, including: (a) inventory and description of the Bay's subtidal areas; (b) the relationship between the Bay's physical regime and biological populations; ... (e) where and how restoration should occur.”

The LSP will assist in implementation of this policy by providing additional data on best techniques for restoration at a specific site, describe the densities, locations, and species associated with subtidal habitats at that site, and conduct five years of monitoring on herring presence before and after construction.

Fish, Other Aquatic Organisms and Wildlife Policy 1 (amended April 2002): “To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased.”

The LSP is consistent with this policy because it will restore and increase subtidal habitat in San Francisco Bay.

**COMPLIANCE WITH CEQA:**

The modified LSP remains categorically exempt from the provisions of the California Environmental Quality Act (CEQA), for the reasons described in the earlier staff recommendations (Exhibit 2). In particular, the proposed authorization is categorically exempt from review under CEQA pursuant to 14 California Code of Regulations Section 15306, which exempts projects that involve basic data collection, research, experimental management, and

resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. The LSP projects have been and will be designed as an experimental study to research the most effective subtidal restoration techniques and timing for oyster and eelgrass restoration that may be applied to larger future projects in San Francisco Bay and may lead to future additional action and funding that has not yet been approved. Further, these seven small Phase 2 LSP demonstration projects each involve 250 square feet of test plots for eelgrass, oyster, cordgrass, and gumplant restoration treatments at the seven candidate sites, which will lead to selection and implementation of a one-acre pilot project at one of the candidate site. The acreage represents a fraction of the 250,000 acres of subtidal habitat in the bay.

The demonstration and one pilot project involve the placement of eelgrass seed buoys and oyster shell substrate on the bottom at each site, where the bay floor has already been disturbed due to adjacent dredging projects, ferry and boat wakes, and additional stressors. This project builds upon techniques used in previous efforts that have developed methods to reduce bottom disturbance and have documented minimal impacts to resources. Not only does this project have a minimal impact on resources, the restoration outcomes will have a net positive effect on subtidal areas of the bay through the enhancement of foundational eelgrass and oyster habitats that support multiple species of invertebrates, fish, and wildlife; act as a nursery for spawning and rearing of aquatic species; and help to stabilize sediments, reduce wave action, and protect critical wetland sites that have already been identified as regionally important.

In addition, the Phase Two LSP demonstration projects and the eventual one acre pilot project are also categorically exempt from review under CEQA Guidelines Section 15333(14 Cal. Code Regs. §15333) as a small habitat restoration project, each well below five acres in area and collectively less than five acres, whose purpose is to assure the restoration and enhancement of habitat for fish, plants, or wildlife, and with no significant adverse impact on endangered, rare or threatened species or their habitat, no known hazardous materials at or around the project site and, given the scale and methodology, no potential for cumulatively significant effects.

Conservancy staff will file a Notice of Exemption upon approval of the project.