

COASTAL CONSERVANCY

Staff Recommendation

December 6, 2018

SAN FRANCISCO BAY LIVING SHORELINES PROJECT

File No. 10-010-01

Project Manager: Marilyn Latta

RECOMMENDED ACTION: Authorization to disburse up to \$1,200,000 for native oyster restoration implementation and monitoring activities for the San Francisco Bay Living Shorelines Project at Giant Marsh in the Point Pinole Regional Shoreline in City of Richmond, Contra Costa County.

LOCATION: Giant Marsh on the Point Pinole Regional Shoreline (City of Richmond, Contra Costa County).

PROGRAM CATEGORY: San Francisco Bay Area Conservancy

EXHIBITS

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

Exhibit 2: [May 24, 2018 Staff Recommendation](#)

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 \$1,200,000 (one million two hundred thousand dollars) to implement the Living Shorelines Project (LSP) in San Francisco Bay, at Giant Marsh on the Point Pinole Regional Shoreline in the City of Richmond, Contra Costa County, for installation of native oyster elements, native marsh plantings, upland ecotone plantings, and monitoring of the project treatments following installation.

These funds will be used to enter into or augment grant agreements with Smithsonian Environmental Research Center (SERC) and Ducks Unlimited (DU) to implement and monitor the Giant Marsh Living Shoreline project.

Disbursement of the funds shall be subject to the following conditions:

1. 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:

- a. A plan detailing the proposed project work, including a work program, schedule and budget.
 - b. All contractors the grantee intends to retain for the project.
 - c. Documentation that all permits and approvals needed for the project work have been obtained.
 - d. Any agreements required to enable the grantee to implement, maintain and monitor the project and to protect the public's interest in the installed oyster elements.
2. In carrying out any work, the grantees shall comply with:
- a. All applicable mitigation and monitoring measures that are required by any permit or approval for the project.
 - b. To the extent that the work is funded by other outside grant funds, all requirements of those grants.”

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. Smithsonian Environmental Research Center and Ducks Unlimited, as potential grantees, are all nonprofit organizations recognized 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.”

PROJECT SUMMARY:

The multi-habitat San Francisco Bay 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, as well as areas of the San Francisco Bay shoreline that are vulnerable to sea level rise and shoreline erosion. To-date, \$3,770,000 in total funds have been utilized to conduct planning, site selection, final project and monitoring design, and implementation of LSP pilot projects at two sites (San Rafael and Hayward), as well as post-implementation monitoring of those projects. The funds have also been used to assess seven additional sites in San Francisco Bay, and to complete the planning, design, and permitting for the project at Giant Marsh in Richmond. Of these total funds, \$1,320,000 are federal funds that the Conservancy obtained through two FWS grants (National Coastal Wetlands

Conservation grant and North American Wetlands Restoration Act grant) and a National Fish and Wildlife Foundation grant.

Of the total amount of LSP funds disbursed to date, \$995,000 have been authorized for the LSP project at Giant Marsh, with \$625,000 of those funds being disbursed as part of work on a number of LSP project sites. Staff proposes the authorization of an additional disbursement of up to \$1,200,000 (One million two hundred thousand dollars) to continue funding the implementation of native oyster, tidal marsh, and upland ecotone treatments, and post-implementation monitoring of all treatments, at Giant Marsh on the Point Pinole Regional Shoreline in the City of Richmond, Contra Costa County.

Work at Giant Marsh is being coordinated by the Conservancy in collaboration with East Bay Regional Park District and State Lands Commission (landowners) as well as other non-profit and government entities, and incorporates the lessons learned from the LSP pilot projects implemented in 2012 at San Rafael and Hayward. The multi-habitat Project at Giant Marsh integrates subtidal habitat restoration of native oyster (*Ostrea lurida*) and native eelgrass (*Zostera marina*) 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. The integrated approach involves restoring these habitats as a linked gradient from marsh to intertidal reefs and subtidal aquatic beds, to increase habitat connectivity and structure and promote restoration of a functional estuarine system that supports key species at various life stages and allows for species connectivity between multiple habitat types. The integrated enhancement project, that includes native oyster reefs and eelgrass bed treatments, as well tidal marsh treatments (native cordgrass *Spartina foliosa*), rare plant treatments (*Suaeda californica*), and transition ecotone species treatments (*Grindelia stricta* and other species) to increase vertical habitat structure and prey availability for multiple species while also testing new approaches to climate adaptation and shoreline protection in the face of sea level rise.

The project activities cover a total of two acres spread throughout a larger 368 acre area. By incorporating multiple habitat types into the living shorelines design, the Conservancy can further test the ability of these habitats to provide both biological habitat benefits (for example nesting and food resources) as well as physical shoreline protection (for example wave attenuation and sediment stabilization).

The additional funding provided under this proposed authorization will help support the implementation of the oyster reefs, marsh plantings, and upland ecotone plantings; and post-implementation monitoring of all seven habitat treatments in the project as required by permitting agencies. In the staff recommendation for the Conservancy's May 2018 authorization, staff anticipated additional fundraising for the remainder of project management and monitoring costs for Giant Marsh, and we expect additional funds needed beyond this current proposed authorization. This type of innovative habitat restoration work is new to the state and to the San Francisco Bay Area, so there are very few constructed living shorelines projects with data on costs that can provide examples to inform our planning. The cost estimates for fabrication and implementation of the oyster elements was higher than estimated, which resulted in additional need for funds for implementation and monitoring. Ducks Unlimited has indicated to Conservancy staff that the estimated cost of implementation for the Giant Marsh LSP would be \$963,550. The implementation of the oyster reefs, marsh plantings, and ecotone

plantings is planned for January – December 2019. The total estimate of remaining funds needed to complete the full Giant Marsh pilot project, including through all required post-implementation monitoring, is \$900,000, and Conservancy staff and project collaborators are submitting a variety of additional grant proposals this year to cover these future anticipated expenses.

Project History: As explained in prior Conservancy authorizations from August 5, 2010, December 2, 2010, March 29, 2012, December 5, 2013, March 26, 2015, December 1, 2016, and May 24, 2018 (see Exhibit 2 for the May 24, 2018 Conservancy authorization), the Conservancy approved funding for the LSP in the cumulative amount of \$3,7700,000, of which: \$1,450,000 were Conservancy funds, \$950,000 were U.S. Fish and Wildlife Service (FWS) grant funds to the Conservancy, \$700,000 were Wildlife Conservation Board (WCB) grant funds to the Conservancy, \$370,000 were National Fish and Wildlife Foundation (NFWF) grant funds to the Conservancy, and \$300,000 were U.S. Environmental Protection Agency (EPA) funds granted to the Conservancy through the Association of Bay Area Governments (ABAG). The LSP is part of a continuing effort by the Conservancy, NOAA, EPA, the Ocean Protection Council (OPC), and others to promote long-term management and restoration of subtidal habitat, and to 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 to develop restoration and research priorities. The final report was completed in December of 2010 and the Conservancy and partners are working to implement the recommendations through regional habitat restoration projects like the LSP.

Description of LSP Accomplishments to Date

The San Rafael and Hayward sites were completed in summer 2012, and high frequency monitoring activities were conducted through December 2017. Major benefits at San Rafael include more than four million native oysters that settled at the site at the height of recruitment, as well as more than 10 taxa and dozens of species of plants (seaweeds), invertebrates, fish, and birds that have been utilizing the reefs and have been documented at the site. The reefs provide an increase of 30% in wave attenuation at the site during mean tide levels, and the reefs have accumulated sediment. Eelgrass plantings have been successful and have expanded up to 300% during certain time periods, but both eelgrass and oysters are subject to impacts from periods of freshwater, and we documented loss of both species during the major atmospheric river event in winter 2016-17. Native oysters are recruiting at the San Rafael site again as of Fall 2017. San Francisco State University was recently awarded an OPC grant to plant additional eelgrass at the San Rafael site, to plant eelgrass at the Giant Marsh site, and to monitor water quality at San Rafael and Giant Marsh to assess whether eelgrass co-located with oyster reefs can help to improve dissolved oxygen levels and therefore act as a buffer to help provide amelioration to ocean acidification.

The LSP implements specific recommendations in the *Subtidal Habitat Goals Project* (2010) and the *San Francisco Baylands Ecosystem Habitat Goals Report* (1999). In addition, the *Baylands Goals Science Update* (2015) recommends the use of “living shorelines” techniques to achieve multiple objectives and ecosystem services while protecting shorelines from climate changes such as sea level rise and wave inundation. Additional local, state, and federal guidance documents include recommendations to further test living shorelines and nature-based design

components, and this project has made specific efforts to incorporate these recommendations into the project goals and design. Examples include the Tidal Marsh Recovery Plan (USFWS 2013), Safeguarding CA report (2014, update in process 2018), San Francisco Estuary Blueprint (San Francisco Estuary Partnership 2016), Marin County BayWave Adaptation Report (Marin County 2017), and BCDC's Adapting to Rising Tides recommendations (BCDC 2017).

The Conservancy has been a leader in the development of this restoration approach in San Francisco Bay and on the West Coast. Conservancy staff and the project team wrote a chapter on the 2012-2015 results at San Rafael for inclusion in the first national book on Living Shorelines. *Living Shorelines: The Science and Management of Nature-Based Coastal Protection* (CRC Press March 2017) provides coastal communities with the scientific foundation and practical guidance necessary to implement effective shoreline management that enhances ecosystems and coastal resilience now and into the future. The book serves as a valuable reference to guide scientists, students, managers, planners, regulators, environmental and engineering consultants, and others engaged in the design and implementation of living shorelines.

The Conservancy and Project Manager Marilyn Latta helped to co-host the second National Living Shorelines Technology Transfer Workshop in collaboration with Restore America's Estuaries in February 2017 in Oakland, CA. This successful meeting included more than 225 participants from all five national regions so that practitioners, funders, agency staff, non-profits and others can share information on newly developing techniques and data on living shoreline approaches.

Site Description:

The initial LSP work was done at along a portion of the San Rafael shoreline on property owned by The Nature Conservancy, and at a smaller site in Hayward on property owned by the Wildlife Conservation Board. The Giant Marsh LSP project is being conducted at Giant Marsh on the Point Pinole Regional Shoreline. The Project area includes two landowners, State Lands Commission (SLC) and East Bay Regional Park District (EBRPD). The Conservancy has a required lease agreement with SLC and a required encroachment permit with EBRPD, and regularly coordinates day to day access and activities with EBRPD who manages the overall site. The locations for this work are all in the upland ecotone, low intertidal, and 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 location.

PROJECT FINANCING:

Funding Sources for LSP:

This authorization (for Giant Marsh):

Conservancy	<u>\$1,200,000</u>
Subtotal	<u>\$1,200,000</u>

Previous authorizations (for Giant Marsh and other LSP project sites):

Conservancy*	\$1,450,000
Executive Officer Authorizations	\$135,000
Executive Officer Augmentations	\$383,916
FWS Grants (2)	\$950,000
NFWF Grant (1)	\$370,000
Association of Bay Area Governments (EPA funds)	\$300,000
Wildlife Conservation Board	<u>\$700,000</u>
Subtotal	<u>\$4,288,916</u>

Total	<u>\$5,488,916</u>
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** The authorizations and augmentations of up to 15% were made under the Executive Officer's delegated authority. The \$135,000 in Executive Officer Authorizations include \$95,000 from Golden Gate Bridge HTD.*

It is anticipated that the Conservancy's funding under this authorization for this project will come from the fiscal year 2018/2019 appropriation to the Conservancy from the "California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018" (Prop 68, Public Resources Code Division 45, Chapters 1-13, Sections 80000-80173). Chapter 8 of that bond act allocates \$20 million to the Conservancy for projects that qualify for grants from the San Francisco Bay Restoration Authority (Public Resources Code section 80110(b)(10)). The proposed authorization qualifies for use of these funds, because it will support the restoration and enhancement of tidal and subtidal areas along the shoreline of San Francisco Bay. These restoration efforts have already received direct financial support, as described above.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

With the inclusion of the Giant Marsh project, 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 prior 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 the San Francisco Bay Conservation and Development Commission (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 Giant Marsh LSP is further consistent with the collaborative planning effort behind the Baylands Goals Science Update, also produced in collaboration with these agencies.

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 Baylands Goals Science Update, 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, as mentioned above; (3) it will be implemented in a timely manner, with partners prepared to proceed; (4) it provides opportunities for habitat improvement, flood and sea level rise mitigation benefits that could be lost if the project is not implemented quickly; 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 2018 STRATEGIC PLAN
GOAL(S) & OBJECTIVE(S):**

Consistent with a top regional priority listed for San Francisco Bay area of the Conservancy’s 2018-22 Strategic Plan, the proposed LSP Giant Marsh project will further the LSP by continuing to implement and monitor native oyster restoration and living shoreline approaches.

Consistent with **Goal 8, Objective C**, the LSP Giant Marsh project will implement projects to increase resilience to sea level rise or other climate change impacts using nature-based solutions.

Consistent with **Goal 12, Objective D**, the LSP Giant Marsh project will enhance subtidal habitat.

**CONSISTENCY WITH CONSERVANCY’S
PROJECT SELECTION CRITERIA & GUIDELINES:**

The proposed LSP Giant Marsh 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 enhancing native tidal marsh and subtidal habitat species, the project serves to promote and implement several statewide plans and policies including the:
 - **San Francisco Bay Water Quality Control Plan for the San Francisco Basin** (last amended in May 2017): 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** (last amended in October 2011): 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 project 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 Ecosystem Habitat Goals (1999, plus 2015 Science Update):** Both Goals documents, created by a consortium of federal, state and local non-profit and public entity stakeholders, including the Conservancy, recommend the restoration of native *Spartina* in the San Francisco Estuary in order to protect native biodiversity and ecosystem functions of mudflats, marshes, and associated 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 and this Giant Marsh pilot project is supported by the National Fish and Wildlife Foundation, City of Richmond, East Bay Regional Park District, NOAA Fisheries Restoration Center, San Francisco Bay Joint Venture, and the San Francisco Estuary Partnership. The Project also has broad public support from non-governmental organizations such as The Watershed Project, California Conservation Corps and others (see Exhibit 2).
5. **Location:** The LSP Giant Marsh 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 Giant Marsh LSP would not occur without Conservancy participation and previous funding from other grants.
7. **Greater-than-local interest:** The Giant Marsh 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 Giant Marsh LSP helps to improve resiliency of natural habitats, which is one of the overarching recommendations in climate change adaptation

planning. The Giant Marsh LSP project itself is designed to help address sea level rise concerns and will not result in increased vulnerability.

Additional Criteria

- 9. Urgency:** Without this funding, the LSP Giant Marsh project would not occur at this time. The installation season for native oyster work is in April-May 2019, so there is additional urgency with utilizing the funds in time for this season in 2019.
- 10. Resolution of more than one issue:** The Giant Marsh pilot project, as part of 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. Innovation:** The Giant Marsh project, as part of LSP, will implement recommendations in the San Francisco Bay Subtidal Habitat Goals Report and Baylands Goals Science Update and continues to build on new, innovative techniques developed through the San Francisco Bay Living Shorelines Projects initially built in San Rafael and Hayward.
- 12. Readiness:** The implementation of the Giant Marsh project is ready to commence upon approval of disbursement of funding by the Conservancy.
- 13. Realization of prior Conservancy goals:** See “Project History” section above.
- 14. Cooperation:** The LSP is a collaborative project involving the Conservancy and many agencies, including San Francisco State University, DU, SERC, CWF, United States Geological Survey, Olofson Environmental, and East Bay Regional Park District.
- 15. Minimization of Greenhouse Gas Emissions** The LSP incorporates measures to minimize emissions throughout implementation of the Giant Marsh pilot project. Work is completed by local staff, contractors, grantees, and community volunteers that live in close proximity to the project locations. Recommended regional implementation best management practices have been followed. Materials and equipment used for the project have 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.”

Through the Giant Marsh pilot project, the LSP will continue to 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 installation.

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 Giant Marsh project is consistent with this policy because it will restore and increase subtidal habitat in San Francisco Bay.

COMPLIANCE WITH CEQA:

The Giant Marsh LSP project is categorically exempt from the provisions of the California Environmental Quality Act (CEQA), for the reasons described in previous staff recommendations (Exhibit 2). In particular, the proposed authorization is categorically exempt from review under CEQA pursuant to CEQA Guidelines (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 demonstration 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. The acreage represents a fraction of the 250,000 acres of subtidal habitat in the San Francisco Bay.

The Giant Marsh project, along with the earlier pilot projects of the LSP is also categorically exempt from review under CEQA Guidelines Section 15333 (14 Cal. Code Regs. Section 15333) as a small habitat restoration project, and is well below five acres collectively for all pilot projects, 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 filed a Notice of Exemption in December 2016 for the project.