

SAN FRANCISCO BAY RESTORATION AUTHORITY

Staff Recommendation  
October 15, 2021

**Evolving Shorelines Project at Bothin Marsh**

Project No. RA-030  
Project Manager: Linda Tong

**RECOMMENDED ACTION:** Authorization to disburse up to \$255,000 to Golden Gate National Parks Conservancy to develop schematic designs for enhancing Bothin Marsh Open Space Preserve and realigning a segment of the Bay Trail in Marin County.

**LOCATION:** Bothin Marsh, Mill Valley, Marin County; Measure AA Region: North Bay.

**MEASURE AA PROGRAM CATEGORY:** Safe, Clean Water and Pollution Prevention Program; Vital Fish, Bird and Wildlife Habitat Program; Integrated Flood Protection Program; Shoreline Public Access Program.

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**EXHIBITS**

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

Exhibit 2: [Project Designs and Photographs](#)

Exhibit 3: [Project Letters](#)

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**RESOLUTION AND FINDINGS**

Staff recommends that the San Francisco Bay Restoration Authority adopt the following resolution and findings:

Resolution:

The San Francisco Bay Restoration Authority hereby authorizes the disbursement of an amount not to exceed two hundred fifty-five thousand dollars (\$255,000) to Golden Gate National Parks Conservancy to develop schematic designs for enhancing Bothin Marsh Open Space Preserve and realigning a segment of the Bay Trail in Marin County. Prior to commencement of the project, the grantee shall submit for the review and written approval of the Executive Officer of the Authority the following:

1. A detailed work program, schedule, and budget.

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2. Names and qualifications of any contractors to be employed in carrying out the project.
3. A plan for acknowledgement of Authority funding.

### Findings:

Based on the accompanying staff recommendation and attached exhibits, the San Francisco Bay Restoration Authority hereby finds that:

1. The proposed authorization is consistent with The San Francisco Bay Restoration Authority Act, Gov. Code Sections 66700-66706.
2. The proposed authorization is consistent with The San Francisco Bay Clean Water, Pollution Prevention and Habitat Restoration Measure (Measure AA).

### **STAFF RECOMMENDATION**

#### **PROJECT SUMMARY:**

Staff recommends that the Authority authorize a grant of up to two hundred fifty-five thousand dollars (\$255,000) to Golden Gate National Parks Conservancy for the Evolving Shorelines Project at Bothin Marsh (“the project”) in Marin County (Exhibit 1). This project will develop a conceptual design into schematic design (35% level of design) to protect, restore, and enhance the Bothin Marsh Open Space Preserve and elevate and realign a one-mile segment of the Bay Trail out of its existing flood prone location. The Golden Gate National Parks Conservancy and Marin County Parks are co-managing this effort to adapt the tidal marsh complex to sea level rise and ensure continued public access to the shoreline through nature-based strategies.

The Bothin Marsh Open Space Preserve (the Preserve) is Marin County Parks’ most visited park unit and the most vulnerable to sea level rise. The Bay Trail segment that runs through the Preserve will be increasingly compromised by tidal flooding. The Preserve’s 67 acres of tidal wetlands are particularly vulnerable to sea level rise due to the relatively low ambient suspended sediment concentrations in this part of Richardson Bay. This limits the wetlands’ ability to grow vertically to keep up with sea level rise by capturing sediment. Although the Bothin Marsh complex is relatively small compared to other marsh complexes in the San Francisco Bay, it is the largest remaining tidal marsh habitat in Richardson Bay, supports higher than average biodiversity, and provides critical habitat for wildlife in the region, such as the federally and State endangered Ridgway’s rail, and Point Reyes bird’s-beak, a rare native plant.

The current Bay Trail alignment was constructed on a former railroad levee that substantially alters the hydrologic connectivity between Richardson Bay and South Bothin Marsh, which affects marsh ecological function and habitat quality. Tidal flow into South Bothin Marsh is restricted to a small inlet, which has reduced tidal sediment transport. This has resulted in a sediment-depleted marsh, particularly at higher elevations, accelerating the impacts of rising water on the ecosystem. Additionally, the current Bay Trail fragments the connection between North Bothin Marsh and South Bothin Marsh and is a barrier for wildlife movement between the marshes. Maintaining the Preserve’s ecological health and public access amenities, including protecting tidal wetlands to provide the multiple benefits of habitat, water filtration, and flood

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protection, requires the comprehensive approach for adaptation to existing and projected sea level rise described below.

Since 2017 the Parks Conservancy and Marin County Parks have partnered to commission scientific studies of the project site, coordinate a multi-agency working group, engage the community to develop a shared vision for the Preserve, initiate conceptual design with a consultant team led by Wallace Roberts & Todd LLC (WRT) and Environmental Science Associates (ESA), and assemble a scientific and technical advisory committee of leading wetland scientists and sea level rise experts. The project has just completed conceptual design, funded through a partnership between the Marin Community Foundation (MCF) and the California State Coastal Conservancy (SCC). Several projects funded through the MCF/SCC partnership have gone on to receive the San Francisco Bay Restoration Authority's Measure AA grants. In the upcoming phase of the project, the Parks Conservancy and Marin County Parks (MCP) aim to continue community engagement and to refine the preferred concept into a Schematic Design. The preferred concept would provide more ecological function than other alternatives by realigning the existing segment of Bay Trail and allowing the marsh to be reconnected to the bay.

The project includes various potential improvements, including the following plans (Exhibit 2):

- Elevating and realigning a segment of the Bay Trail along South Bothin Marsh and elevating a segment of the Bay Trail along North Bothin Marsh, to accommodate over three feet of sea level rise and a 100-year storm surge.
- Constructing ecotone slopes along trail embankments through thin-lift sediment placement to create high marsh habitat, with the potential to be engineered as a flood protection levee.
- Establishing fluvial connectivity between Coyote Creek and South Bothin Marsh by either realigning Coyote Creek through the marsh or with the creation of new channels.
- Enhancing tidal action and connectivity between Richardson Bay, South Bothin Marsh, and North Bothin Marsh with restored tidal prism and drainage function and process with the expansion of tidal channels.
- Creating high marsh habitat through constructed marsh mounds from tidal channel excavation spoils.
- Protecting against marsh erosion with construction of up to four acres of beach habitat.
- Enhancing subtidal mudflat habitat with sediment augmentation and tidal creek channel creation.
- Exploring opportunities to beneficially re-use dredged material through collaboration and partnerships with Marin County Flood Control and nearby marina managers.

The project also strives to include scientific research on tidal marsh adaptation approaches. Building the studies into the project design and identification of baseline data will be a key component of the Schematic Design Phase. The scientific and technical advisory committee has identified several opportunities for research, including design, constructability, and performance of features such as coarse beach creation, thin-lift sediment placement, and ecotone slopes.

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The Parks Conservancy has comprehensive experience restoring shoreline habitat and public recreation sites of similar scale to the Preserve, including its work in partnership with the National Park Service at Crissy Field and Muir Beach. Similar to Bothin Marsh, the Redwood Creek restoration at Muir Beach included restoration of floodplain habitat, process, and function; reconnection of hydrological systems with construction of new creek channels and alignments; and development of a new visitor circulation system including several large bridges.

In spring of 2018, MCP and the Parks Conservancy hosted a multi-day Stakeholder Advisory Committee workshop with individuals representing dozens of local agencies and organizations. This workshop was critical to developing common understanding of sea level rise issues facing the Preserve and local community, scoping the project, and developing a broad-based community engagement strategy. Since the fall of 2018, the project team has directly engaged with over 900 community members at events such as kayak tours of the Preserve, a historical ecology lecture and map exhibit, a biking event, volunteer days, a youth scavenger hunt, local farmers markets and community events, a 4-month long StoryWalk exhibit installed on the Bay Trail, and a 3-hour Community Happy Hour with 200 attendees. During the Conceptual Design Phase in 2020, the project team had to scale back in-person community engagement efforts due to COVID-19. The project team presented initial design elements to the community through a Virtual Happy Hour, gave public presentations to the Mill Valley Safe Routes to School Task Force, the Marin County Open Space Commission, and the Marin Conservation League, and gave staff presentations to the City of Mill Valley and the Marin County BayWAVE Steering Committee. Three Adaptation Concepts were presented to community members via Zoom and a feedback survey regarding the concepts solicited community feedback through Fall 2020. The community-based planning strategy is based on fostering local partnerships including the Marin County Bicycle Coalition, the Mill Valley Library & Recreation Departments, the Mill Valley Historical Society, ABAG/Bay Trail, National Park Service, the Richardson Bay Audubon Center and Sanctuary, Marin Community Clinic, Marin City Library and several local businesses and environmental leaders (Exhibit 3). In addition to special programs and events developed with these partnerships, project messaging has been incorporated into regular outreach programs through One Tam and MCP including volunteer events.

The Preserve will likely lose all its high marsh if no actions are taken to improve sediment transport and deposition and to reduce shoreline erosion within the next ten years. The baylands at the Preserve are bordered by highly developed urban areas rather than transition zone or upland habitats where Bothin Marsh could migrate to higher elevations with sea level rise. As such, the tidal wetlands will likely convert to mudflats or subtidal habitat with sea level rise if no action is taken. The project aims to engage with the local community to establish increased awareness of anticipated impacts of sea level rise on habitats and infrastructure and potential adaptation measures. By facilitating early planning efforts and providing an example of coordinated multi-jurisdiction and multi-benefit sea level rise planning, the project strives to catalyze the development of informed nature-based sea level rise adaptation policies and strategies in neighboring communities. Maintaining Bothin Marsh in the near-term will preserve more options as actual sea levels become more certain. A key question that the Schematic Design Phase seeks to address is the fluvial and tidal sediment deposition capacity, which will help quantify the sediment accretion potential through restoration of natural processes to assist the marsh in keeping pace with sea level rise.

**Site Description:**

The 106-acre Preserve, which is owned by the Marin County Open Space District and managed by Marin County Parks, is located along the biologically rich shoreline of upper Richardson Bay near the unincorporated community of Tamalpais Valley and the City of Mill Valley in Marin County. The Preserve is also adjacent to several parks and public facilities including schools, public transit, a sewage treatment plant, arterial roads, and utilities infrastructure. The Preserve's trails provide shoreline public access, connect local neighborhoods to commercial hubs and community centers, and serve as part of multi-modal transportation network. The segment of Bay Trail that runs through the preserve connects Mill Valley to Marin City and Sausalito. Heavily traveled Shoreline Highway and Miller Avenue border the Preserve on the west and are also prone to flooding in high tide and storm events.

Bothin Marsh's 67 acres of tidal wetlands range from subtidal mudflats to low marsh to high marsh with limited transition zone and upland habitats. Richardson Bay, which is part of the larger San Francisco Bay, is located on the Pacific Flyway, a major flyway for migratory birds through North and South America. During the winter months, it supports thousands of waterbirds, shorebirds, and waterfowl. Many acres of mudflats are exposed at low tide, providing important feeding areas for shorebirds and habitat for small crustaceans. Approximately 55 fish species inhabit Richardson Bay. Bothin Marsh was historically formed by the accumulation of sediments deposited from Arroyo Corte Madera del Presidio and Coyote Creek. The watersheds of these two streams account for 78% of the total catchment for upper Richardson Bay. The watersheds are home to about 25,000 people and over 32% of the land area has been developed as urban spaces.

**PROJECT FINANCING**

<b>San Francisco Bay Restoration Authority</b>	<b>\$255,000</b>
Philanthropic Funds	\$140,000
Marin County Measure A	\$75,000
<b>Project Total</b>	<b>\$470,000</b>

**CONSISTENCY WITH AUTHORITY'S ENABLING LEGISLATION, THE SAN FRANCISCO BAY RESTORATION AUTHORITY ACT:**

The project is consistent with Government Code Section 66704.5 of the Authority's Enabling Legislation, and therefore is eligible for grant funding from the Authority. Golden Gate National Parks Conservancy is a nonprofit, which is an eligible grantee under Section 66704.5(a). The project will occur along the shoreline of Richardson Bay in Marin County, which is within the Authority's jurisdiction. The project is a voluntary habitat restoration planning project that would restore, protect, and enhance tidal wetlands on the San Francisco Bay shoreline, which is an eligible project under Section 66704.5(b)(1). It would also plan to enhance flood management features and improve public access and recreational amenities at Bothin Marsh Open Space Preserve, making it an eligible project as defined in Section 66704.5(b)(2) and (3). Funding this planning project is consistent with Section 66704.5(e), which allows the Authority to award grants for all phases of planning of eligible projects.

**CONSISTENCY WITH MEASURE AA PROGRAMS AND ACTIVITIES:**

The project is consistent with the programs and activities of Measure AA, as outlined below:

The project supports the *Safe, Clean Water and Pollution Prevention Program* by restoring and enhancing the Bothin Marsh Open Space Preserve's tidal wetlands to encourage continued natural water filtration and remove pollution from the Bay.

The project supports the *Vital Fish, Bird and Wildlife Habitat Program* by protecting, restoring, and enhancing the Preserve's low marsh, high marsh, transition zone, upland, and subtidal habitats which host the Bay's waterbirds, shorebirds, waterfowl, and fish species.

The project supports the *Integrated Flood Protection Program* by planning for ecotone slopes and trail embankments that could be raised in the future to provide flood protection for the surrounding community.

The project supports the *Shoreline Public Access Program* by elevating and realigning existing public shoreline trails, including the Mill Valley-Sausalito Multi-Use Pathway (segment of Bay Trail) and the Charles McGlashan Multi-Use Pathway.

**CONSISTENCY WITH MEASURE AA PRIORITIZATION CRITERIA:**

1. **Greatest positive impact.** Restoring, enhancing, and protecting the Preserve's bayland habitat will increase the climate resiliency of its native wildlife and biological diversity. This includes habitat for special status species such as Ridgway's rail, California black rail, and Point Reyes bird's beak. In addition, the Bay Trail serves as an important recreational and commuting route, and the section at the Preserve sees the highest usage of any multi-use path in Marin County. It connects Sausalito and Marin City in the south to Tam Valley and Mill Valley in the north, and is a critical, non-motorized transportation corridor. The Bay Trail and the connecting McGlashan Pathway, also located at the Preserve, provide designated safe routes to school for residents of Marin City and Tamalpais Valley. The trails at the Preserve also provide a key linkage to other regional trail networks including the Bay Area Ridge Trail and the California Coastal Trail in the Marin Headlands. The project's eye towards nature-based strategies such as establishment of high marsh and ecotone levees can help absorb the impacts of storms and floods, and the flood risk to the assets surrounding the Preserve could be reduced.
2. **Greatest long-term impact.** With its particularly low elevation and existing sea level rise impacts, the Preserve serves as a preview of what sea level rise will look like elsewhere in the San Francisco Bay. Lessons learned from the project's nature-based design and implementation will be applicable to local and regional sea level rise planning and tidal marsh restoration efforts. This project ensures time to create a larger, long-term strategy and not lose existing habitat in the near term.
3. **Leveraging resources and partnerships.** The Golden Gate National Parks Conservancy and Marin County Parks are part of the One Tam partnership, which convenes inspired community members and jurisdictional agencies to support long-term stewardship of Mt.

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Tam. The One Tam partnership has leveraged the financial resources of partner agencies to complete a county-wide fine scale vegetation map, topographic map, and landscape database. The data and products derived from this joint effort have provided the basis for a detailed landscape level topographic survey, and for hydrologic and hydraulic modeling and analysis of adaption concepts and flooding scenarios for all Marin County sea level rise projects. The project is also leveraging the work of Marin County Department of Public Works through the SB1 Caltrans Adaptation Planning Grant for the “Highway 1 Corridor in Tam Valley Transportation Resiliency Planning” project. The focus of that project is on addressing flooding concerns at the Highway 1 and 101 corridor which overlaps the Bothin Marsh Project area. That project has modeled the flood conveyance capacity of alternatives for realigning Coyote Creek into Bothin Marsh, and this concept will be further analyzed in the Schematic Design Phase. SB1 is also funding additional sea level rise adaptation concept development for the segments of the Bay Trail and the Manzanita Park & Ride area adjacent to the project. These adaptation concepts will be integrated into a coordinated approach to sea level rise adaptation planning for this entire shoreline reach.

4. **Economically disadvantaged communities.** The economically disadvantaged community of Marin City is linked to the Preserve by the Bay Trail. The Parks Conservancy will aim to engage community members in the project by working with Marin County Parks on outreach and seeking ways to network and collaborate with local organizations.
5. **Benefits to economy.** The Parks Conservancy and Marin County Parks maintain ongoing partnerships with Conservation Corps North Bay, a nonprofit that hires diverse young men and women to gain skills and work in the conservation field. This project would be an ideal continuation of that collaboration and elements of the project implementation suitable for NBCC will be identified and planned for as early as possible in the project’s design.
6. **Engage youth and young adults.** In addition to Conservation Corps North Bay, other established partnerships that educate, train, and involve youth in stewardship, conservation, and maintenance will be utilized for this project. Specifically, the Linking Individuals to their Natural Community (LINC) program has already spent three seasons with sessions focused on sea level rise and adaptation at Bothin Marsh. LINC is a summer internship program for high school students that emphasizes development of leadership skills and assisting in service projects with One Tam partners. At Bothin Marsh, over 60 LINC students have been involved in workshops to develop shared values and goals for Bothin Marsh, model and test design concepts for sea level rise adaptation, and most recently, students were asked to apply what they learned about sea level rise at Bothin Marsh to their own experience and create a Climate Change pledge and presentation. The project will continue to involve LINC students in this project and future phases. A four-month long installation of a StoryWalk exhibit in 2019 at Bothin Marsh was directly targeted at youth and their parents. This installation leveraged and is strengthening partnerships with Chronicle Books, Marin City Library, and the Mill Valley Library and School District to directly engage more youth and young adults in Bothin Marsh and raise awareness about wetland habitats and sea level rise impacts. The proximity of Bothin Marsh to libraries and several Mill Valley schools lends itself to continued collaboration and future opportunities for youth engagement.

7. **Monitoring, maintenance, and stewardship.** Marin County Parks will continue to remove non-native invasive plants in the Preserve in the years leading up to and following construction of the project. Marin County will also continue observation and monitoring of populations of Point Reyes bird's-beak, a rare plant present in the Preserve. The future implementation phase of the project would include stewardship through a robust citizen science program and ongoing maintenance that might include invasive plant removal, plant monitoring, seed collecting, and native planting.
  
8. **Coastal Conservancy's San Francisco Bay Area Conservancy Program.** The project meets the criteria of the San Francisco Bay Area Conservancy Program:
  - a. The project is consistent with several adopted regional and local plans. The project is consistent with the recommended actions in the Baylands Ecosystem Habitat Goals and 2015 Update, in that the goal is to design and restore a complete tidal wetland system at Bothin Marsh and it would test adaptation techniques that integrate flood control and habitat benefits in a highly visible setting. Similarly, by restoring and enhancing tidal wetlands and special status species habitat the project also meets several goals and objectives of the Comprehensive Conservation and Management Plan (CCMP) and the Recovery Plan for Tidal Marsh Ecosystems for Northern and Central California.
  - b. The project serves a regional constituency, as it is consistent with goals of the regional San Francisco Bay Trail Plan/Trail Design Guidelines, the Regional Bicycle Plan for the San Francisco Bay Area as well as the local Tamalpais Area Community Plan, the County Wide Plan, and the Mill Valley General Plan. The project would accomplish goals and specific upgrades to the Bay Trail recommended in the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan.
  - c. The project can be implemented in a timely way, as the conceptual designs have been completed.
  - d. The project should be implemented quickly otherwise the habitat, ecosystem services, and public access benefits of that the Preserve provides to a regional constituency will be lost or severely impaired.
  - e. Prior phases of this project received funding from Marin County Measure A as well as the California State Coastal Conservancy and the Marin Community Foundation through the Advancing Nature-Based Adaptation Solutions grant program. This phase of the project will leverage additional Marin County Measure A funds and philanthropic funds through One Tam.
  
9. **San Francisco Bay Conservation and Development Commission's Coastal Management Program.** This project is consistent with several policies of BCDC's Coastal Management Program, San Francisco Bay Plan:
  - a. Fish, Other Aquatic Organisms and Wildlife, Policy 3: restore the Bay's tidal marshes to assure benefits of fish, other aquatic organisms and wildlife.
  - b. Tidal Marshes and Tidal Flats, Policy 4: enhance marsh tidal action.
  - c. Tidal Marshes and Tidal Flats, Policy 6: incorporate restoration monitoring.
  - d. Public Access, Policies 4 and 13: plan for public access at the earliest stage and design project to be compatible with restoration and wildlife habitat.

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- e. Climate Change, Policy 3: address the project area's resilience to climate change, and its capacity to adapt to climate change impacts such as sea level rise.
- f. Shoreline Protection, Policy 5: incorporate nature-based flood protection techniques into habitat restoration.

10. **San Francisco Bay Joint Venture's Implementation Strategy.** Based on consultation with San Francisco Bay Joint Venture (SFBJV) staff, the project would be consistent with SFBJV's Implementation Strategy, as it would contribute to the goal of enhancing 4,000 acres of bay habitats in the Central Bay Subregion. The project team intends to present the project to the SFBJV Conservation Delivery Committee meeting for adoption.

**COMPLIANCE WITH CEQA:**

The proposed project is statutorily exempt from preparing an environmental impact document under the California Environmental Quality Act Guidelines, California Code of Regulations, Title 14, Section 15262, because the project involves planning for possible future actions which have not been approved, adopted, or funded. In addition, the project is categorically exempt under California Code of Regulations, Title 14, Section 15306, because the project involves basic data collection, research, and resource evaluation activities which do not result in a serious or major disturbance to environmental resources. Upon approval of the project, staff will file a Notice of Exemption.