

COASTAL CONSERVANCY

Staff Recommendation
December 4, 2014

**SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES**

Project No. 02-070-04
Project Manager: Brenda Buxton

RECOMMENDED ACTION: Authorization to disburse up to \$1,000,000 to be reimbursed by the Santa Clara Valley Water District pursuant to a Memorandum of Agreement regarding work undertaken in support of the South Bay Salt Pond Restoration Project's Adaptive Management Program in Santa Clara County.

LOCATION: San Francisco Bay and adjacent shoreline, Santa Clara County.

PROGRAM CATEGORY: San Francisco Bay Area Conservancy Program

EXHIBITS

Exhibit 1: Location Map

Exhibit 2: Pond A8

Exhibit 3: October 18, 2012 Staff Recommendation

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31160 *et seq.* of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the disbursement of up to one million dollars (\$1,000,000) of funds to be reimbursed by the Santa Clara Valley Water District to undertake applied studies associated with the implementation of the South Bay Salt Pond Restoration Project's Adaptive Management Studies, including as follows: to the United States Geological Survey (USGS) up to six hundred thousand dollars (\$600,000) and to the University of California at Davis (UCD) up to three hundred forty thousand dollars (\$340,000), in order to undertake studies related to sediment transport, mercury accumulation in sediments, mercury bioaccumulation, and movement of salmonid fish in the Guadalupe River watershed and the Pond A8 complex. Prior to the disbursement of Conservancy funds for a study, the entity responsible for the study shall submit for the review and approval of the Conservancy's Executive Officer a work program for that study, including a schedule and budget.”

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

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 authorization is consistent with Chapter 4.5 of Division 21 of the Public Resources Code, regarding the Conservancy’s mandate to address the resource and recreational goals of the San Francisco Bay Area.
2. The proposed project is consistent with the current Conservancy Project Selection Criteria and Guidelines.

PROJECT SUMMARY:

This authorization would allow the Conservancy to disburse funds that would be reimbursed by the Santa Clara Valley Water District (SCVWD) for high priority applied studies associated with the implementation of the South Bay Salt Pond (SBSB) Restoration Project, a multi-agency effort to restore 15,100 acres of former Cargill salt ponds in South San Francisco Bay (Exhibit 1).

The project’s goal as stated in the 2007 Programmatic EIS/R is for 90% of the ponds to be restored to tidal wetlands over the 50-year life of the project. However, significant uncertainties remain with a project of this geographic and temporal scale. To address these uncertainties, the agencies leading the project created an Adaptive Management Plan (AMP) calling for the project to be carefully implemented in phases so managers could learn from the results and incorporate them into management and planning decisions. Adaptive management is essential to keeping the project on track towards its objectives and it was the primary tool identified in the EIS/R for avoiding significant impacts to the environment. If the Adaptive Management monitoring and applied studies detect undesired impacts arising from the conversion of ponds to tidal habitat, then the project would stop converting ponds. The actual amount of tidal wetlands restored at the end of the fifty years could be less than the stated 90% goal.

This authorization concerns Pond A8, one of the Phase I implementation projects (Exhibit 2). Pond A8 is located in a mercury-rich environment due to run off from the Guadalupe River watershed, the location of the historic New Almaden Quicksilver Mine. Mercury, a potent toxin, has been identified as one of the key uncertainties in the project’s AMP. The pond is currently opened to muted tidal flow. How much the project will be able to restore to full tidal flow is the question that needs to be resolved by the applied studies proposed in this authorization.

Pond A8 was designed to have a reversible breach so that if adverse mercury impacts were detected, the connection to Alviso Slough could be closed. To do this, a large water control structure with eight 5-foot gates was constructed in 2009-10. Each gate could be independently opened or closed to provide the ability to control the amount of flows in addition to the ability to close off the pond from the tidal waters of Alviso Slough.

The first year of operation, June through December 2011, only one gate of the structure was opened. The structure was then closed in December to protect migratory salmonid species from entrainment in the pond per the National Marine Fisheries Service permit conditions. For this

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

period, the USGS provided monitoring and analysis as called for in the AMP by collecting samples in 2010 prior to the gate opening, and then in 2011 after the gate was open. The following June through December of 2012, three gates were opened as had been previously planned since we did not yet have the results from the 2010/2011 study. No biological samples were taken in 2012, only surveys to determine the extent of scour in the slough. In June of 2013 the results of the mercury applied study from 2010/2011 showed very elevated amounts of mercury methylation in bird eggs in the pond and fish in the slough in response to one gate being open. (The conversion of mercury to its methylated form makes it more easily taken up into the food web.) So in 2013, the 3 gates were opened as in 2012 and additional biological samples were collected, and then the gates were closed in December of 2013. In March of 2014, based on consultation with researchers and regulators, managers opened up 3 gates. It is believed that opening up more gates on Pond A8, earlier in the year, would help to keep the mercury levels low. In July of 2014 the 2013 results showed that bird egg and fish mercury levels had indeed decreased and were close to those level detected in control sites. Based on this, managers decided to open 2 additional gates in September of 2014, for a total of 5 gates open.

The opening of Pond A8 did not cause significant erosion of sediments in Alviso Slough (also a potential source of mercury) so the likely driver of increased methylation was chemical and biological processes in the water column caused by initially opening Pond A8. Since mercury methylation decreased in Pond A8 after the pond was opened to tidal action, this suggests that the closure of the pond was enhancing methylation of mercury, possibly because the closed pond had poor circulation, warmer water, and increased algae blooms, which is associated with increased methylation. In addition, the highly elevated levels of the first year may have been elevated due to the “reservoir effect” where changes in hydrology in wetland systems cause a temporary, initial spike in mercury methylation that decreases over time.

To further investigate the possibilities raised by these applied studies, the US Fish and Wildlife Service plans to keep 5 gates open on Pond A8 year round, starting in December of 2014 until December of 2015, and to continue monitoring. However, the SBSP Restoration Project must simultaneously conduct a fish migration study (by tagging and tracking juvenile steelhead) in the watershed to see if steelhead are entering and leaving the pond; this study is required by NMFS if the USFWS is to keep the pond open year round, or to open the pond prior to June. Keeping the pond open is a high priority as it will likely reduce algae growth in the pond which is, in turn, expected to reduce mercury impacts. In addition, since the mercury levels have decreased over time, it is expected that the spike caused by the “reservoir effect” has passed but additional data is needed to confirm this.

The SCVWD is one of the SBSP Restoration Project partners and has provided funding for project planning, the construction of the Pond A8 structure, the associated South Bay Shoreline Study (a US Army Corps of Engineers Feasibility Study), and for previous mercury investigations. The SCVWD is providing up to \$1,000,000 for these studies because the SCVWD seeks to increase tidal flushing in Alviso Slough in order to improve flood conveyance. One way to widen Alviso Slough is to increase the amount of tidal water flowing in and out of Pond A8 by opening the structure as much as possible and/or creating additional breaches. But before this can happen, the SBSP Restoration Project must complete the applied studies necessary to answer questions about the impacts to mercury methylation and to fish migration. By funding these studies, the SCVWD will be closer to its goal of restoring the historic tidal regime in Alviso Slough.

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

The studies will be conducted by a collaborative team of scientists, including scientists from USGS and UC Davis (UCD), most of whom have worked on mercury and fish biosentinel studies funded by the Conservancy and the USEPA (see October 18, 2012 Staff Recommendation, Exhibit 3). Other UCD fishery researchers who have studied fish populations and movement in the south bay will conduct the fish migration study. The studies are expected to be completed by the end of 2015.

Site Description: These studies are focused on the 1,440 acres of the Pond A8 complex (made up of Ponds A8, A8S, A5, and A7) as well as adjacent waters. The Pond A8 complex was part of the 2003 salt pond acquisition and now is part of the Don Edwards San Francisco Bay National Wildlife Refuge. (Exhibit 2).

Salt ponds surround nearly the entire San Francisco Bay south of the San Mateo Bridge (Exhibit 1), on lands that were formerly tidal marsh. An estimated 85 percent of the historic tidal marshes in the San Francisco Bay-Delta Estuary have been filled or significantly altered over the past two centuries for urban development, agriculture, and salt production. Although dramatically different from 150 years ago, the South Bay’s wetland habitats, including the salt ponds, tidal marshes, sloughs, mudflats, and open bay, are used by large populations of waterfowl and shorebirds, by harbor seals, and by a number of threatened and endangered species, including the California clapper rail, California black rail, California brown pelican, California least tern, western snowy plover, salt marsh harvest mouse, and steelhead trout.

Project History: In March 2003, 15,100 acres of South Bay salt ponds, along with 1,400 acres of crystallizer ponds along the Napa River, were acquired from Cargill with \$72 million from the Wildlife Conservation Board, \$8 million from the U.S. Fish and Wildlife Service, and \$20 million from the Goldman Fund, Hewlett Foundation, Moore Foundation, and Packard Foundation.

Immediately after acquisition, the landowners, California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service, implemented the Initial Stewardship Plan which was designed to maintain open, unvegetated pond habitats with enough water circulation to prevent salt production and provide some habitat values. The longer-term planning effort, a 50-year programmatic level plan for restoration, flood protection, and public access that included a first phase of projects, was facilitated by the Conservancy and completed in January of 2009. (The SBSP Restoration Project EIR/S is available at southbayrestoration.org). Phase I implementation began in 2009 and included the construction of 3,040 acres of tidal or muted tidal wetlands, 710 acres of enhanced managed pond, and 7 miles of new public access. The last Phase I construction project will be complete this year and planning for Phase II is underway and will be complete in early 2015. The ponds that were not part of Phase I, nor planned to be part of Phase II, will continue to be actively managed according to the goals set forth in the Initial Stewardship Plan until further implementation planning and the appropriate adaptive management studies are completed.

PROJECT FINANCING

Santa Clara Valley Water District	\$1,000,000
Project Total	\$1,000,000

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

These funds are being made available by the Santa Clara Valley Water District on a reimbursable basis.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

This project would be undertaken pursuant to Chapter 4.5 of the Conservancy's enabling legislation, Public Resources Code Sections 31160-31165, to address resource goals in the San Francisco Bay Area.

The SBSP Restoration Project is within the nine-county Bay Area as required under Section 31162 of the Public Resources Code.

Under Section 31162(b), the Conservancy may act to protect, restore, and enhance natural habitats and connecting corridors, watersheds, scenic areas, and other open-space resources of regional significance. Resolving scientific uncertainties through the Adaptive Management Plan's recommended Applied Studies, such as these studies, is an essential element of the phased restoration plan for the SBSP Restoration Project.

Under Section 31162(d), the Conservancy may act to promote, assist, and enhance projects that provide open space and natural areas that are accessible to urban populations for recreational and educational purposes. These applied studies will help the SBSP Restoration Project design, construct and manage the next phase of projects and will help resolve on-going project uncertainties.

Consistent with Section 31163(c), these studies are part of the on-going restoration of the SBSP Restoration Project which meets the following criteria: (1) is supported by adopted regional plans (*San Francisco Bay Plan (March 2012)*, *San Francisco Baylands Ecosystem Habitat Goals Report (1999)*, and the *San Francisco Basin (Region 2) Water Quality Control Plan (June 29, 2013)*), (2) is multijurisdictional (spanning three counties) and serves a regional constituency (provides regionally significant habitat), (3) can be implemented in a timely way, (4) provides opportunities for habitat benefits that could be lost if the project is not quickly implemented; and (5) includes matching funds.

The project is also consistent with Sections 31163(a) and (b), directing the Conservancy to participate in and support interagency actions and public/private partnerships in the San Francisco Bay Area to implement long-term resources and outdoor recreational goals. The planning, construction, monitoring, science and management of the SBSP Restoration Project has been a collaborative effort between many federal, state, and local agencies, nonprofit organizations, private foundation, and private businesses.

Pursuant to Section 31104, the Conservancy may apply for and receive financial support from public and private sources.

**CONSISTENCY WITH CONSERVANCY'S 2013
STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):**

Consistent with **Goal 11, Objective C** of the Conservancy's 2013-2018 Strategic Plan, the proposed studies will assist with the development of restoration plans for the 11,350 acres remaining in the project.

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

**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:** The restoration, flood protection and adaptive management actions of the SBSP Restoration Project serves to promote and implement several state plans including:
 - *CA Climate Adaptation Strategy/Safeguarding California: Reducing Climate Risk Plan (July 2014).* The plan identifies Actions Needed To Safeguard Biodiversity And Habitats including #2 Implement adaptive management studies to refine approaches for conserving biodiversity, especially for species and communities vulnerable to climate change such as coastal wetlands.
 - *California Water Action Plan (2014).* The project helps achieve Goal #4, Protect and Restore Important Ecosystems as it is one of the 10 "large-scale habitat projects along the California coast in strategic coastal estuaries to restore ecological health and natural system connectivity, which will ... help defend against sea level rise". In addition, the project supports Goal #8, Increase Flood Protection, calls for flood protection projects that achieve multiple benefits including through floodplain restoration.
 - *California @ 50 Million: The Environmental Goals and Policy Report (2013 Draft).* Key Action #3 of the "Preserve and Steward State Lands and Natural Resources" calls for building resilience in natural systems and specifically points out that wetlands "provide important carbon sequestration opportunities for the state."
 - *CA Wildlife Action Plan (2005).* The project will further the following statewide recommended actions: a) The California Resources Agency, Fish and Game, the U.S. Fish and Wildlife Service, public land managing agencies, and local governments need to develop multicounty regional habitat conservation and restoration plans; g) Public agencies and private organizations need to collaboratively protect and restore lowland linkages in San Francisco Bay. In addition, the plan notes that mercury contamination has become a major concern for wildlife conservation in the Bay-Delta region. The recommended studies will help evaluate management options to minimize this contamination.
4. **Support of the public:** The SBSP Restoration Project is supported by Senator Dianne Feinstein, the Richard and Rhoda Goldman Fund, the William and Flora Hewlett Foundation,

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

the Gordon E. and Betty I. Moore Foundation, the David and Lucile Packard Foundation, Resources Legacy Fund, the California Resources Agency, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Santa Clara Valley Water District, Alameda County Flood Control District, the San Francisco Bay Joint Venture, Save The Bay, The Bay Institute, National Audubon Society, Citizen's Committee to Complete the Refuge, Cargill, and many other agencies, organizations, and individuals.

5. **Location:** The SBSP Restoration Project is in the nine-county San Francisco Bay Area consistent with Section 31162 of the Public Resources Code. These studies are largely based in the southern portion of the project area but will benefit the entire project as impacts from mercury and fish entrainment are Bay-wide concerns.
6. **Need:** Approximately 85 percent of the tidal marsh in San Francisco Bay has been lost since the Gold Rush, leading to dramatic losses of fish and wildlife, decreased water quality and increased turbidity in the Bay, and changes to physical processes as the size of the Estuary shrank, increasing the need for dredging and the local hazards of flooding. The need for restoration of tidal marsh in San Francisco Bay in order to aid in the recovery of at-risk species, and improve water quality and the physical health of the Bay, is well recognized among scientists and resource managers. Without the resolution of the scientific uncertainties, the ability of the project to continue to restore wetlands will likely be curtailed. Conservancy funding is needed to fill the funding gap for required studies to support on-going SBSP Restoration Project efforts.
7. **Greater-than-local interest:** Restoration of this area is of national significance and will result in the largest tidal wetland restoration project on the west coast of the United States. When combined with other restoration projects underway in San Francisco Bay, including Napa-Sonoma Marsh, Hamilton/Bel Marin Keys, Bair Island, Eden Landing, and Sonoma Baylands, the project is on scale with other national restoration efforts, such as the Everglades and Chesapeake Bay. Restoration of the South Bay salt ponds to a mix of tidal marsh and managed ponds will provide benefits to a large number of species, including migratory waterfowl and shorebirds, and aid in the recovery of several threatened or endangered species, including the California clapper rail and salt marsh harvest mouse.
8. **Sea level rise vulnerability:** Due to their location, all tidal wetland restoration projects can be vulnerable to sea-level rise impacts. However, once the marsh plain of a restored wetland is colonized by vegetation, marshes become efficient sediment traps. Hydrological modeling done as part of the SBSP Restoration Project's geomorphological analysis indicates that the south Bay's wetlands are likely to keep up with an accelerated pace of sea-level rise. If sea-level rise rates are higher than modeled, it could take longer for marsh vegetation to develop or, in more extreme scenarios, may mean that the restoration sites do not evolve past the intertidal mudflat or shallow open water stage. However, much of the SBSP Restoration Project area is likely to withstand the impacts from sea-level rise in the foreseeable future for several reasons. The south bay is relatively sediment-rich and Phase I projects have shown much more rapid than predicted sedimentation and colonization by vegetation. These studies will help resolve scientific uncertainties and by doing so, allow wetland restoration to proceed sooner, helping the wetlands establish before sea-level rise accelerates.

Additional Criteria

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

9. **Urgency:** These studies need to start immediately in order to get the data needed to answer the questions regarding mercury at Pond A8.
10. **Resolution of more than one issue:** The Adaptive Management Plan addresses multiple scientific uncertainties that arise when trying to restore habitat, particularly in areas with legacy contamination issues.
11. **Leverage:** See the “Project Financing” section above.
13. **Innovation:** Restoration of the South Bay salt ponds is a national model for how to coordinate a scientifically sound, publicly-supported, multi-objective, multi-agency project, on scale with the Everglades and Chesapeake Bay.
15. **Realization of prior Conservancy goals:** This project builds on the Conservancy’s participation in the development of the *San Francisco Baylands Ecosystem Habitat Goals Report*, which has goals, objectives, and recommendations for restoration in San Francisco Bay, and the Conservancy’s participation in wetland acquisition and restoration projects in San Francisco Bay, including Napa Marsh, Bair Island, and Hamilton/Bel Marin Keys. This authorization builds upon previous authorizations by the Conservancy for the SBSP Project, totaling \$20 million in Conservancy funds and \$190 million in federal, other state agencies, local, foundation, and mitigation funding to date.
16. **Return to Conservancy:** See the “Project Financing” section above.
17. **Cooperation:** The Conservancy has facilitated the long-term restoration planning by working closely with Department of Fish and Wildlife and U.S. Fish and Wildlife Service, the land managers. A mix of private foundations and federal, state, and local agencies have funded the restoration planning and implementation. In addition, over 50 entities have been identified as stakeholders in this restoration project, including local, state, and federal agencies, nongovernmental organizations, special districts, and utilities, as well as the general public.

CONSISTENCY WITH SAN FRANCISCO BAY PLAN:

The SBSP Restoration Project is within the permit jurisdiction of the San Francisco Bay Conservation and Development Commission (“BCDC”).

The proposed studies will further the implementation of the project which is consistent with the following policies of BCDC's San Francisco Bay Plan (Reprinted March 2012):

Part III: The Bay as a Resource

Fish, Other Aquatic Organisms and Wildlife (p. 16)

- 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.

Water Quality (p.19)

- The Bay’s tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality.

Water Surface Area and Volume (p. 20)

*SOUTH BAY SALT POND RESTORATION:
ADAPTIVE MANAGEMENT STUDIES*

- Water circulation in the Bay should be maintained, and improved as much as possible.

Tidal Marshes and Mudflats (p. 23-24)

- Where a transition zone does not exist and it is feasible and ecologically appropriate, shoreline projects should be designed to provide a transition zone between tidal and upland habitats.
- Where feasible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action in order to replace lost historic wetlands or should be managed to provide important Bay habitat functions, such as resting, foraging and breeding habitat for fish, other aquatic organisms and wildlife.
- Any ecosystem restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria, and a monitoring program to assess the sustainability of the project.

COMPLIANCE WITH CEQA:

Scientific studies are categorically exempt from CEQA review under 14 California Code of Regulations Section 15262. Similarly, 14 Cal. Code of Regulations Section 15306 exempts basic data collection, research, and resource-evaluation activities that will not result in a serious or major disturbance to an environmental resource. Staff will file a Notice of Exemption upon approval of the project.

