

COASTAL CONSERVANCY

Staff Recommendation
September 22, 2011

INVASIVE SPARTINA PROJECT

99-054-03
Project Manager: Marilyn Latta

RECOMMENDED ACTION: Consideration and possible Conservancy authorization to disburse up to \$1,000,000 for 2011 and 2012 revegetation activities, including planning, seedling propagation, planting of native seedlings and revegetation monitoring and maintenance, as part of the 2011 permitting for the Invasive *Spartina* Project within the San Francisco Estuary.

LOCATION: Sites within the Invasive *Spartina* Project treatment areas in San Francisco Bay and lower creek channels of the nine counties that bound the San Francisco Bay.

PROGRAM CATEGORY: San Francisco Bay Area Conservancy

EXHIBITS

Exhibit 1: [March 17, 2011 Staff Recommendation](#)

[Note: Copies of exhibits to this March 17 staff recommendation will be provided to Conservancy members and may be found at: www.scc.ca.gov]

Exhibit 2: [August 8, 2011 Draft Revegetation and Monitoring Plan](#)

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Chapter 4.5 of Division 21 of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the following:

1. Disbursement of up to \$650,000 (six hundred fifty thousand dollars) for two years of planning and implementation of revegetation projects to increase native vegetation as part of the ongoing invasive and hybrid *Spartina* treatment and eradication projects under the Invasive *Spartina* Project (ISP) Control Program. These grant funds may be used for seedling propagation, on-the-ground planting of native seedlings, and revegetation monitoring and maintenance and may augment existing grants to the California Wildlife Foundation and the Friends of Corte Madera Creek Watershed or may be disbursed to a new grantee, Save San Francisco Bay Association. This authorization is subject to the following conditions:

- a. Prior to implementing any revegetation projects and prior to disbursement of any funds to the grantee, the grantee shall submit for review and approval of the Executive Officer a plan detailing the site-specific revegetation work, including a schedule and budget, and evidence that the grantee has obtained all necessary permits and approvals for the project.
 - b. In carrying out any revegetation project, the grantee shall comply with all applicable mitigation and monitoring measures that are set forth in the approved Invasive Spartina Project Revegetation and Monitoring Plan, that are required by any permit, any Biological Opinion or approval for the project, and that are identified in the “Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program” (FEIS/R), adopted by the Conservancy on September 25, 2003.
2. Disbursement of up to \$350,000 (three hundred fifty thousand dollars) that will be reimbursed by the Wildlife Conservation Board (WCB) to contract for environmental services to plan for future restoration and revegetation work and identify opportunities for and develop future projects to create marsh elevations for high tide flood refugia habitat or floating islands at appropriate ISP Control Program treatment sites and to prepare environmental or other documentation that may be required for any permits or approvals for such future projects and that may be required under CEQA or NEPA. Prior to disbursement of any WCB funds, the Executive Officer shall enter into a Memorandum of Understanding with the WCB, permitting the Invasive *Spartina* Project (ISP) Control Program work under this authorization as an approved phase of project work under WCB Agreement No. WC-3032BT, describing the budget and work to be performed, and providing for reimbursement of the Conservancy’s expenditures for the work.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. Disbursement of additional funds for the implementation of program revegetation project, and for technical planning for future habitat restoration projects under the ISP Control Program, remains consistent with Public Resources Code Sections 31160-31165 and with the resolutions, findings and discussion accompanying the Conservancy authorizations of September 25, 2003, June 16, 2005, May 24, 2007, April 24, 2008, April 2, 2009, June 4, 2009, and March 17, 2011 as detailed in the staff recommendations attached as Exhibit 1 to the accompanying staff recommendation.
2. The proposed authorization remains consistent with the current Project Selection Criteria and Guidelines, as detailed in Exhibit 1 to the accompanying staff recommendation. .
3. The California Wildlife Foundation, Friends of Corte Madera Creek Watershed, and Save San Francisco Bay Association are nonprofit organizations 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.”

PROJECT SUMMARY:

The Conservancy has previously authorized funding for ongoing treatment and eradication of invasive *Spartina* and its hybrids within the San Francisco Bay Estuary, under the Conservancy's Invasive *Spartina* Project (ISP) Control Program. (See Exhibit 1). Since initiation of the ISP Control Program, it has been anticipated that certain revegetation activities would be needed as mitigation to offset habitat for native wildlife that would be lost as a result of the treatment activities. Simultaneous revegetation of native *Spartina foliosa* and high tide flood refugia plant zones was not feasible at the early stages of the project, as seedlings would have been at risk of over-competition and hybridization with *Spartina alterniflora*, or at risk of getting sprayed with herbicide during treatment. Now that eradication is almost complete at most sites, the conditions are appropriate to revegetate with native seedlings, without risk of over-competition, hybridization, or death from herbicide application.

The draft ISP Control Program Revegetation Program (Revegetation Program) has been developed for revegetation of native *Spartina foliosa* and additional native marsh plant species that provide high tide flood refugia for the endangered California clapper rail and other species living in the marshes in San Francisco Bay, and to otherwise restore native vegetation to the wetlands and streams that have been affected by treatment and eradication of invasive *Spartina*. This staff recommendation proposes funding for two activities described under the draft Revegetation Program: 1) grants to two existing grantees and to one new grantee to carry out revegetation activities (Revegetation Implementation Projects); and 2) environmental services to undertake technical planning and to prepare environmental documentation for future restoration and revegetation work (Technical Planning). These activities are described in greater detail, as follows:

1. Revegetation Implementation Projects.

These projects will be undertaken through grants to existing and new Conservancy grantees. The projects involve revegetation planning, seedling propagation and on-the-ground planting of native seedlings, and revegetation monitoring and maintenance. The activities will be focused on up to 20 priority sites in San Francisco Bay and will be implemented between 2011 through 2013. Total proposed funding for these activities is \$650,000.

2. Technical Planning.

Technical Planning activities will be undertaken by environmental services contractor(s) retained by the Conservancy. The activities will include planning for future restoration and revegetation work and identification of opportunities and development of future projects for creation of marsh elevations for high tide flood refugia habitat and floating islands at appropriate Invasive *Spartina* Project treatment sites in San Francisco Bay. In addition, the retained contractor(s) will prepare documentation that may be required for any permits for such future projects and that may be required under CEQA or NEPA to revise, augment or supplement the existing "Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program" (FEIS/R), adopted by the Conservancy on September 25, 2003.

These activities will also take place during 2011 through 2013. Total proposed funding for these activities is \$350,000.

PROJECT HISTORY

The Conservancy first approved funding for the ISP Control Program in September 2003 (see Exhibit 1 and staff recommendations attached as exhibits to Exhibit 1). This invasive species eradication project has become a successful, region-wide model for treating an invasive species with multiple landowners and agency stakeholders participating in the project in all nine counties of the San Francisco Bay Area. Since the peak of invasion in 2005, the Control Program has resulted in the elimination of more than 700 net acres (nearly 90%) of invasive *Spartina alterniflora*, *densiflora*, *anglica*, and *patens*; and hybridized *Spartina foliosa x alterniflora* and *Spartina densiflora x alterniflora* from more than 20,000 acres of infested tidal marsh and mudflats bay-wide. There is an estimated total of less than 100 net acres of remaining non-native and hybrids, located within thousands of acres of tidal wetland sites in San Francisco Bay.

Since 2005, the Conservancy, with the assistance of its contractors, has coordinated, and its grantees have implemented, the ISP Control Program at 25 sites that include more than 170 sub-sites in the estuary. Treatment methods through 2010 have included one or more of the following, singly or in combination: manual removal (hand digging and covering of plants); mechanical removal (discing); herbicide application via manual methods (accessing wetland sites on foot and applying herbicide via backpack sprayers and direct application to plants), broadscale herbicide application techniques via mechanical methods (application of herbicide via amphibious vehicles, airboats, and helicopter spraying); and a combination of sub-lethal mechanical removal plus herbicide application (seed suppression). The ISP staff completed two reports - on 2010 treatment activities and on 2010 monitoring activities - in June 2011, which summarizes project success to date.

As shown in Exhibit 1, the area of non-native *Spartina* has been reduced markedly since the first full season of effective treatment started just five years ago. In most areas where non-native *Spartina* has been eradicated, the result has been rapid and large-scale return to a native-plant species dominated habitat at low- and mid-marsh elevations, and a return to the natural mudflat and tidal channel conditions at lower elevations. As the marshes recover from the *Spartina* invasion over time, it is anticipated that historical vegetative complexity and density will be passively re-established in most marshes.

However, in some locations, particularly near the point of initial introduction and in areas where hybrids were intentionally transplanted, the hybrid cordgrass (and in one case, dense-flowered cordgrass (*Spartina densiflora*)) had effectively displaced most of the native flora, significantly damaging the native marsh structure. This change to marsh structure has caused impacts to the endangered California clapper rail, and implementation of the Revegetation and Monitoring Plan (Exhibit 2) is necessary to create habitat to benefit rails.

Pilot revegetation projects have been underway since 2006, involving multiple participants at several sites and providing the basis for expected success with the scaled-up full revegetation approach described in this proposal. The pilot efforts include upland transition zone plantings by Save San Francisco Bay Association and East Bay Regional Park District at three sites within the Martin Luther King, Jr. Regional Shoreline in San Leandro Bay: Arrowhead Marsh, Martin Luther King, Jr. Restoration Marsh, and Damon Slough. Save San Francisco Bay Association has also worked with the California Department of Fish and Game at the Eden Landing Ecological Reserve in Hayward to pilot upland transition zone plantings along levees of newly

opened salt ponds within this site. The Friends of Corte Madera Creek has worked closely with the Marin County Department of Parks and Open Space and the Marin County Public Works Department over the past year, to implement mid-marsh plantings at Creekside Park along Corte Madera Creek in San Rafael. The Invasive *Spartina* Project staff conducted pilot broadcast seeding efforts in 2006 at Cogswell Marsh, Oro Loma Marsh, and Elsie Roemer Marsh; channel reconstruction and native mid-marsh plantings in 2006 at Elsie Roemer Marsh on Alameda Island; and pilot *S. foliosa* plantings in January 2011 at Elsie Roemer Marsh and along Colma Creek. These and other similar revegetation projects are being monitored to assess techniques and success, and provide valuable data and lessons learned that will be applied to a scaled-up approach to revegetation at up to 20 sites from 2011-2013.

Building on the recommendations of the 1999 San Francisco Baylands Ecosystem Habitat Goals Project, the Conservancy has been a leader in multiple large-scale wetland restoration projects in San Francisco Bay, including the South Bay Salt Ponds Restoration Project, Hamilton Wetlands Restoration Project, Sonoma Baylands Restoration Project, Napa-Sonoma Marshes Restoration Project, and dozens of other sites. In addition, the Conservancy has provided funding to multiple small revegetation projects conducted by local agencies, grassroots creeks groups, and community-based restoration programs.

The current proposal requests funding for 2011-13 “Phase II” revegetation approaches at up to twenty sites. These pilot projects will result in improved habitat at each of the locations, in addition to providing data to inform the best approaches for the additional revegetation efforts.

Overview of Revegetation Approach: The Conservancy proposes a revegetation program that will accelerate successional revegetation following successful non-native *Spartina* control at selected tidal marshes. The approach will be customized to each marsh, based on the existing conditions and the potential for successful revegetation. For example, many of the most heavily invaded marshes were restoration and mitigation projects opened to tidal flow between 1990 and 2005, where the aggressive hybrid *Spartina* quickly dominated the marsh and precluded other vegetation. In these areas *Spartina* control has ‘reset’ the “natural” vegetative development to an early successional stage, similar to what would have been present 2-5 years after the initial breach. These marshes tend to consist of perennial pickleweed (*Sarcocornia pacifica*), annual pickleweed (*Salicornia depressa*) and other low-growing, mat-forming plant species, with the missing component being *Spartina foliosa*. Some of these marshes are in proximity to *S. foliosa* populations, and the native could reestablish “passively”, without assistance.

In many areas, such as San Leandro Bay and the Hayward and San Leandro shorelines, the geographic scope and density of the invasive *Spartina* effectively extirpated native cordgrass from broad areas, and the native will have to be introduced or reintroduced to the marsh by planting. There is, however, a significant risk associated with introducing *Spartina foliosa* where it may be pollinated by hybrid *Spartina*. The hybrid produces a much greater volume of pollen than the native, and effectively swamps the native flowers, producing hybrid seed which continues to spread invasively. Thus, great care must be taken in choosing locations for *Spartina foliosa* planting, and in monitoring planted areas for any signs of invasive hybrid behavior.

Another aspect of the revegetation plan is to augment other native plant species within the tidal marsh plain and in adjacent upland areas, where it will enhance refugia for California clapper rails. While these plants are not in danger of being pollinated by hybrid *Spartina*, they would be at risk of being damaged during *Spartina* treatment, so care must be taken to time these plantings as well, and to coordinate plantings with treatment planning.

The Invasive *Spartina* Project began planting marsh gumplant (*Grindelia stricta*) via seed and seedlings at selected marshes in 2006 and 2007, and pilot projects for replanting *Spartina foliosa* began in 2010. These projects are being monitored and assessed, and the results will be used to inform the future revegetation efforts.

The Conservancy, through its contractors and its grantees will implement a revegetation management structure that will:

- Implement detailed work plans in coordination with all regional participants, stakeholders and regulatory agencies (U.S. Fish and Wildlife Service, California Department of Fish and Game, East Bay Regional Parks District, Save San Francisco Bay Association, Friends of Corte Madera Creek, California Wildlife Foundation, revegetation contractors, and local native plant nurseries),
- Coordinate planning, implementation, monitoring and maintenance activities,
- Produce documentation necessary for Federal and State permitting of activities,
- Obtain individual site access permissions,
- Set up revegetation contracts and conduct planting events led by trained experts,
- Implement a limited number of planting events with volunteers,
- Direct in-field training and oversight of volunteers and contractors,
- Schedule and coordinate monitoring and maintenance activities,
- Produce yearly reports on revegetation progress based on success criteria,
- Adaptively manage the program based on project-generated results.

Revegetation Program Goals and Objectives: The over-arching goal of the Revegetation Program is to establish, as rapidly as possible through active revegetation and continued non-native *Spartina* treatment, approximately 10 acres of estuarine intertidal emergent wetland habitat. Continued treatment of non-native *Spartina* will allow for passive revegetation of all marshes where non-native *Spartina* treatment occurs, which represents more than 95% of the revegetation that will take place in these areas. Both of these revegetation activities, active and passive, will be managed with the intent to re-establish habitat suitable for California clapper rail occupancy, where feasible.

In order to facilitate successful implementation of the project goals, the revegetation effort will be centrally coordinated and scaled relative to the area available for direct plantings. Initial pilot project work and full-scale implementation of propagation, seed and plant collection, planting, monitoring and maintenance was begun in 2006, and lessons learned from these projects will be applied to a scaled-up approach to revegetation at additional sites. The revegetation work is

aimed to maximize the ecological benefit of the effort in the shortest possible timeframe, with lasting and self-perpetuating positive outcomes.

Goals:

1. Enhance and accelerate *Spartina foliosa* re-establishment at selected marshes through introduction of plugs or propagated seedlings that will support associated faunal communities including clapper rail foraging and nesting habitat.
2. Enhance and accelerate post-treatment marsh succession and complexity with introduction of other native marsh plant species (such as *Grindelia stricta*, *Triglochin maritima*, and others), which have a tall shrubby structure that will provide clapper rail nesting substrate, cover and high tide refugia.

Objectives:

1. Coordinate with ISP Partners and Estuary-wide restoration groups to collaborate on revegetation methods, monitoring, planting and public education programs for long-term success.
2. Conduct science-based revegetation projects that use best methods and planting scenarios for *Grindelia stricta*, *Spartina foliosa* and other suitable tidal marsh plant species as appropriate.
3. Coordinate significant revegetation efforts on a variety of sites, building on knowledge gained from previous smaller-scale Phase I pilot revegetation efforts from 2006-2010, and Phase II pilot revegetation efforts from 2011-13.
4. Comprehensively monitor planting efforts, including:
 - Genetic screening of donor plant populations;
 - Global Positioning System mapping of planting sites;
 - Monitoring of planting survivorship, planting method assessment, habitat assessment and spread of both passive and active revegetation;
 - Genetic monitoring of areas planted with *Spartina foliosa*;
 - Clapper rail monitoring;
 - Maintain planted areas (e.g., re-planting, weed control) to assist in survivorship of plantings through at least the first 5 years post-planting; and
 - Adaptively manage plantings to maximize potential California clapper rail benefits.

Research and Management Questions: A major goal of this effort is to expedite revegetation success in order to benefit California clapper rail populations. Several aspects of this program have never been tried in San Francisco Bay, including propagation and planting of native *Spartina foliosa*, new methods to expedite the speed and success of revegetation plantings, and specific revegetation designs to expedite California clapper rail colonization and use of

revegetated areas. Existing pilot revegetation projects have been designed to answer several critical questions about how best to achieve these goals, and this information has been incorporated into the revegetation design and data collection that is currently underway. Revegetation projects during the next two seasons (winter 2011 through spring 2013) will continue to provide additional information on how best to increase speed and success of this effort. For more information about specific research and management questions this project will address, please see Exhibit 2.

Ecotone Adaptive Management Plan: Funding for Save San Francisco Bay Association will also support the development of an Ecotone Revegetation Adaptive Management Plan. This management plan will be a guide for restoration managers, policy makers, and restoration organizations to restore ecotone habitat in the San Francisco Bay using best practices with demonstrated methods and cost-effective restoration methods. The plan will be based on Save San Francisco Bay Association's successful approach to ecotone revegetation and lessons learned by their program over the past decade. The plan will be a useful tool not only for the ISP revegetation program, but also for restoration practitioners across the Bay Area.

Conservancy staff anticipates that this funding will be sufficient for revegetation implementation and technical planning activities through March 2013, and that funding for 2014-16 will be needed to continue and expand the revegetation program. Conservancy staff expects to seek outside grant sources (e.g. United States Fish and Wildlife Service National Coastal Wetlands Conservation Grant Program and others) to add funding for later years.

Revegetation funding for the ISP is critical at this stage of the project as we comply with Endangered Species Act regulations, and approach the 2013 goal of zero non-native *Spartina* at 90% of sub-sites, and the 2016 monitoring goal for eradication.

PROJECT FINANCING

Conservancy Funds	\$1,000,000
Save SF Bay Association (cash)	\$100,000
Save SF Bay Association (in-kind services)	\$50,000

TOTAL PROJECT COSTS **\$1,150,000**

The anticipated breakdown of disbursement of the Conservancy funds is as follows:

A. Revegetation Projects:

Friends of Corte Madera Creek	\$20,000
Save San Francisco Bay Association	\$160,000
California Wildlife Foundation	<u>\$470,000</u>
Total	\$650,000

B. Technical Planning

Environmental Services Contractor(s) \$350,000

TOTAL **\$1,000,000**

The proposed disbursement of up to \$1,000,000 under this authorization will derive from Conservancy and WCB bond funds.

It is anticipated that \$650,000 for the revegetation project grants will come from appropriations to the Conservancy in fiscal year 2009-10 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 bays and coastal waters, including projects to protect and restore the natural habitat values of coastal waters and lands, pursuant to the Conservancy’s enabling legislation, Division 21 of the Public Resources Code. The proposed project serves to restore natural habitat values of the San Francisco Bay watershed. In addition, as discussed below, the project is consistent with Chapter 4.5 of Division 21.

Proposition 84 also requires that for restoration projects that protect natural resources, the Conservancy assess whether the project meets at least one of the criteria specified in Public Resources Code Section 75071(a)-(e). The ISP Revegetation Program satisfies 3 of the specified criteria, as follows: (a) Landscape/Habitat Linkages: the areas that are restored through the removal of invasive *Spartina* are areas that link to, or contribute to linking, existing protected areas with other large blocks of protected habitat; (b) Watershed Protection: the project serves to protect and restore the natural resources of the San Francisco Bay and Estuary, a priority watershed as identified by the Resources Agency; and (c) Under-protected habitats: the project is focused on relatively large areas of intertidal mudflats, tidal marshes and wetlands that are under-protected major habitat types.

Conservancy funding for \$350,000 for the revegetation technical planning costs is expected to be provided under an existing grant agreement by which WCB may provide funds to the Conservancy for San Francisco Bay projects. Under the grant agreement with WCB, the Conservancy may use these funds for habitat restoration projects within the nine-county San Francisco Bay Area that implement the restoration goals of the San Francisco Bay Joint Venture and the San Francisco Baylands Ecosystem Habitat Goals Report and that meet the priorities of the Conservancy as described in Section 31162 of the Public Resources Code. Specific recommendations for the management and eradication of non-native invasive species are made in the 1999 Baylands Habitat Goals Report. The Invasive *Spartina* Project revegetation technical planning is consistent with these recommendations. In addition, any proposed project must, under the WCB grant agreement, be a “high priority” project as identified in the grant agreement or otherwise authorized as a priority project by WCB in the “Memorandum of Understanding” between WCB and the Conservancy that is required before any project may move forward. WCB has agreed to amend the Memorandum of Understanding to identify the proposed work as a “high priority” project and the WCB funding will be dependent on such an amendment, as required by the proposed authorization.

The WCB grant funding, in turn, is derived from an appropriation from the Water Security, Clean Drinking Water, Coastal Beach Protection Fund of 2002 (Proposition 50), The Proposition 50 funds were appropriated under the specific authorization found in Section 79572(c) of the Water Code and may be used for the general purpose of acquisition, protection and restoration of coastal wetlands.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

As described in previous staff recommendations (Exhibit 1) and associated Conservancy resolutions, the ISP serves to carry out the objectives of the San Francisco Bay Area Conservancy Program mandated by Chapter 4.5 of Division 21 of the Public Resources Code, Sections 31160-31165. The proposed project protects and restores tidal marshes, which are natural habitats of regional importance.

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

The ISP and implementation of the Control and Revegetation Programs will continue to carry out the goals and objective of the 2007 Strategic Plan, as specified in the staff recommendation of March 17, 2011 (Exhibit 1).

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

The proposed authorization, which provides additional funding for the ISP Revegetation Program is consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated June 4, 2009, for the same reasons as detailed in the staff recommendation of March 17, 2011 (Exhibit 1).

CONSISTENCY WITH SAN FRANCISCO BAY PLAN:

The ISP Control Program remains consistent with the San Francisco Bay Plan adopted by the San Francisco Bay Conservation and Development Commission, as detailed in earlier staff recommendations (see e.g. Exhibit 1).

COMPLIANCE WITH CEQA:

The need for revegetation projects involving re-planting of native *Spartina* and other native vegetation was recognized and identified in the "Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program" (FEIS/R), adopted by the Conservancy on September 25, 2003. The FEIS/R required such projects as mitigation. The scope of the revegetation projects funded under this proposed authorization are consistent with the mitigation described in the FEIS/R and are intended to offset the loss of habitat due to the ISP Control Program treatment activities.

Since already identified as mitigation under the FEIS/R, no additional environmental documentation is required.

The technical planning aspect of the proposed authorization is just that: planning for future activities, including whatever environmental assessment may be necessary, that the Conservancy has not yet funded or formally approved. Should there be additional formal environmental documentation or procedures required under CEQA, beyond what has already been considered under the FEIS/R, the Conservancy will review those once the activities are defined through the planning process and before approving or funding those activities.