

Indicate the type of applicant (check only one box):

- | | |
|--|---|
| <input checked="" type="checkbox"/> State agency | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit |
| <input type="checkbox"/> Local government/district | <input type="checkbox"/> Private party |
| <input type="checkbox"/> University | <input type="checkbox"/> Other: _____ |

Indicate the type of project (check only one box):

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> Planning | <input checked="" type="checkbox"/> Implementation |
| <input type="checkbox"/> Monitoring | <input type="checkbox"/> Education |
| <input type="checkbox"/> Research | |

By signing below, the applicant declares the following:

- 1.) The truthfulness of all representations in their proposal;
- 2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- 3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

WILLIAM AHERN

Printed name of applicant

William Ahern

Signature of applicant

II. Title Page

a. Title of Project:

Introduced *Spartina* Eradication Project (ISEP)

b. Name of Applicant, Address, Phone, Fax, E-mail:

Nadine Hitchcock, Manager, San Francisco Bay Program
California Coastal Conservancy
1330 Broadway Suite 1100
Oakland, CA 94612 Phone: (510)-286-4176
Fax: (510)-286-0470 E-Mail: nhitchcock@igc.org

c. Type of Organization and Tax Status:

California State Agency . Exempt.

d. Tax Identification Number: # 94 316 4968

e. Participants and Collaborators in Implementation:

Participants:

Research: Dr. Donald Strong UC Davis
Dr. Debra Ayres UC Davis
Dr Lars Anderson USDA - Agricultural Services

Mapping/Monitoring

and Assessment: Dr. Josh Collins San Francisco Estuary
Robin Grossinger Institute

Project Management: Debra L. Smith *Spartina* Project Coordinator
East Bay Regional Park District

Operations/Collaborators: United States Fish and Wildlife Service
United States Department of Agriculture: Agricultural Services
California Department of Fish and Game
California Department of Parks and Recreation
University of California, Davis and Berkeley
East Bay Regional Park District
Alameda County Public Works (Flood Control)
Possible Future Collaborators: Counties of : Sacramento, Solano, Contra-Costa,
Santa Clara, San Mateo, San Francisco, Marin, Sonoma, Napa, Alameda (Flood
Control and Agricultural Commissioners, Parks and Rec.) Area Mosquito Dist.

99E-111

CALFED BAY-DELTA PROGRAM
ECOSYSTEM RESTORATION PROJECTS AND PROGRAMS

III. Executive Summary

a. Project Title and Applicant Name:

Introduced *Spartina* Eradication Project (ISEP)

California Coastal Conservancy

b. Project Description

The Introduced *Spartina* Eradication Project (ISEP) proposes to significantly reduce or eliminate the estimated 1,000 acres of introduced *Spartina* in the San Francisco Bay estuary. The proposed, three year, phased, Introduced *Spartina* Eradication Project (ISEP), is a regionally coordinated program with the primary objectives of preventing further spread of introduced *Spartina* species to the North Bay and Delta, preventing its introduction to new restoration projects and halting the degradation of CALFED priority habitat.

c. Primary Ecological Objectives

- Prevent introduced *Spartina* from spreading to the North Bay and Delta negating the effects of millions of dollars spent on priority habitat restoration including those proposed in Suisun Bay and Marsh Ecological Unit, Sonoma Creek, Petaluma River, and San Pablo Bay Ecological Units.
- Prevent the potential spread of introduced *Spartina* to approximately 40,000 acres of wetland and 29,000 acres of tidal mudflat in the San Francisco Bay estuary to prevent degradation of saline emergent aquatic habitat.
- Reduce the negative biological and economic impacts of established non-native species. (CALFED funding priority #5)
- Benefit migrating neotropical birds, aid the recovery of four special status species including the endangered California clapper rail, California black rail, salt marsh harvest mouse, and one Delta special status plant species, soft birds-beak.
- Reduce a species of Invasive Aquatic Plants, a CALFED identified stressor on the Bay Delta region.
- ISEP addresses CALFED objectives regarding Bay-Delta Aquatic Food Web/Ecosystem Processes. ISEP will prevent and reduce degradation to unvegetated tidal mudflats, sites of important secondary productivity.

ISEP builds on an existing foundation of public support and involvement including the California Department of Fish and Game and the United States Fish and Wildlife Service. ISEP includes comprehensive monitoring and public education components.

CALFED has issued a statement (April, 1999) directing \$250,000 towards *Spartina* related projects. A proposal to utilize these funds for specific initial strategic goals of the demonstration phase of ISEP (Phase I) has been submitted. This grant proposal includes a complete description of the Introduced *Spartina* Eradication Project, including Phase I.

d. Budget Costs and Third Party Impacts.

Total Cost Estimate \$2,914,300.00 Request from CALFED \$2,772,800.00
Anticipated multi-agency match \$ 141,500.00
In-kind contributions \$ 879,000.00

Adverse third party impacts include temporary reduction or closure of public access during control operations. This can be addressed with advance public notification and outreach.

e. California Coastal Conservancy (Conservancy) qualifications:

Applicant Qualifications: The California Coastal Conservancy was created by the Legislature in 1976 and given flexible powers to work in partnership with public agencies and non-profit organizations to protect and preserve coastal and San Francisco Bay resources. The Conservancy has completed more than 400 projects and is currently participating in over 100. It has helped to preserve and/or enhance more than 50,000 acres in tidal and freshwater wetlands, coastal streams, watersheds, and farmlands. It has a staff of 48 which includes environmental planners, attorneys, accountants, and other administrative and clerical support staff.

f. Local Coordination and Support

The Conservancy will administer contracts to the following agencies for the specific components of ISEP (coordination / mapping, monitoring and assessment / research / operations). Team *Spartina*, an interagency advisory panel, will convene biannually to advise, review reports and progress.

California Coastal Conservancy: Project administration, oversight of project and field operation coordinators.

San Francisco Estuary Institute (SFEI): Mapping/monitoring/assessment.

USDA Agricultural Services, Dr. Lars Anderson, and U.C. Davis, Drs. Don Strong, Debra Ayres: Research.

East Bay Regional Park District, Don Edwards Nat'l Wildlife Refuge, Alameda County Public Works (Flood Control), Bay Area Mosquito Abatement Districts, Bay Area County Commissioners (Sacramento, Solano, Contra-Costa, Alameda, Santa Clara, San Mateo, San Francisco, Marin, Sonoma, Napa), California Dept of Fish and Game, USFWS, Alameda Dept of Agriculture, Benecia State Rec, Area: Operations/Field Control. Additional public and private stakeholders will be added to the Operations list of agencies as the project expands.

g. Monitoring and Data Evaluation

SFEI will develop a three year monitoring and data evaluation program. Phase I will include monitoring and mapping of existing populations /new outlying populations and sampling for control efficacy. Each research task includes additional sampling/data collection/protocols and data evaluation. ISEP participants (coordination, mapping, research, operations) will provide annual summaries to the project coordinator for the annual ISEP Status Report. Team *Spartina* will review monitoring and data evaluation.

IV. Project Description

a. Proposed Scope of Work

ISEP proposes a three year plan to significantly reduce or eradicate 1,000 acres of introduced *Spartina* species.

b. Approach/Analytical Procedures

ISEP establishes interagency partnerships to implement coordinated, methodical control of introduced *Spartina*. Eradication emphasizes integrated methods including aerial and ground application of registered herbicide for aquatic environments or permitted experimental application of appropriate new herbicides, mowing, burning, covering, and digging. Efficacy will be monitored and quantified. Successful control methods used in Washington State for *Spartina* control will be investigated and considered for appropriateness in San Francisco Bay. Only methods that provide a net benefit to the baylands and delta will be used. ISEP will incorporate an adaptive management strategy as results from research on control efficacy, hybridity, and population dynamics become known. Comprehensive quantitative monitoring samples including stem density counts from replicated treated plots, GPS coordinates for evaluating the rate of spread, biomass sampling, reproductive output, mudflat elevation measurements, leaf tissue genotypic characterization, invertebrate sampling, and sensitive species surveys. Each specific research task included provide additional sampling/data collection protocols and analytical evaluation.

c. Primary Project Objectives for Phase I (Year 1) and II (Years 2-3):

Phase I (Year 1)

- Establish the management structure and implementation plan necessary for a successful regionally coordinated control program.
- Prevent the spread of introduced *Spartina* to the North Bay and Delta.
- Significant reduction or elimination of populations where prior restoration actions have created habitat most likely to be aggressively invaded by *S. alterniflora*
- Develop a Mapping/Monitoring/Assessment Plan for ISEP
- Develop a Public education and outreach strategy
- Conduct research essential for responsible land management decisions regarding ISEP

Phase II (Year 2-3)

- Significantly expand the Operations/Control Component of ISEP to eliminate or significantly reduce all *Spartina* populations.
- Revise management strategy accordingly to reflect new Phase I research, mapping and monitoring efforts

d. Tasks/Schedule/Deliverables

ISEP Phase I (Year 1) Tasks and Subtasks
Demonstration Project

I. Project Management

- a. Establish a regionally coordinated management structure and strategy for ISEP
- b. Identify, notify, and assist landowners in all aspects of *Spartina* control
- c. Produce a regional ISEP Management and Implementation Plan
- d. Coordinate field operations planning and logistics for control
- e. Identify and purchase equipment, identify maintenance and operations needs
- f. Survey the North Bay and Suisun regions for unreported populations
- g. Prepare Annual ISEP Status Report
- h. Develop a rapid response protocol control actions on newly reported populations
- i. Convene advisory panel as needed (minimally twice)

II. Operations/Field Control

- a. Begin reduction measures on ISEP identified priority populations including north of the SF Bay bridge, populations colonizing mudflats, populations in or near restoration sites, and flood control channels.

III. Public Education and Outreach

- a. Prepare ISEP Opportunities and Strategy Public Education and Outreach
- b. Initial web site development
- c. Prepare and issue Introduced *Spartina* Alert to all land restoration project managers
- d. Develop a ISEP slide presentation public presentations
- e. Develop an ISEP information brochure

IV. Environmental Compliance / Permitting

- a. Prepare a Permits and Regulatory Requirements Report

V. Monitoring/Mapping and Assessment

- a. Map targeted populations w/GPS
- b. Develop ISEP Monitoring Protocol
- c. Contract Phase I aerial photography

VI. Research

- a. Characterize mudflat potential invasion using correlative analysis. Characterization would include nutrient load, grain size, organic content, elevation, total nitrogen, total organics, and salinity.
- b. Use existing and newly developed information on substrate characteristics to produce a

- model to assist in defining potential areas of likely infestation in SF Bay and lower delta.
- c. Research impacts of control methods including impacts on native organisms and stabilization of mudflat.
 - d. Design small and large scale experiments which will further test the control efficacy of new and integrated methods of control including currently registered systemic herbicides in addition to Rodeo, timing of cutting, removal of dead thatch and rack by burning prior to herbicide applications.

ISEP Phase II (Year 2-3) Tasks and Subtasks

I. Project Management

- a. Revised management plan based on new Phase I information
- b. Expand and maintain regional coordination
- c. Continue coordination of the rapid response team to control new outlying populations
- d. Assist agencies with control operations planning and logistics
- e. Identify and purchase equipment, identify maintenance and operations needs
- f. Develop interagency agreements resource sharing.
- g. Conduct regional workshop participating stakeholders on ISEP Status and strategy
- h. Write Annual ISEP Status Report and CALFED quarterly reports
- i. Convene advisory panel as needed (minimally twice)
- j. Web site maintenance and expansion
- k. Develop and issue Recommendations Spartina in SF Bay Restoration Projects

II. Field Operations

- a. Expanded control of *Spartina* populations as outlined in the Management Plan

III. Public Education/Outreach

- a. Implement strategy public outreach as identified in Phase I report
- b. Web Site Expansion and maintenance

III. Environmental Compliance

- a. Complete environmental compliance (CEQA/NEPA) requirements and all other permitting identified in Phase I Compliance Report
- b. Continued coordination of endangered species surveys as required, permitting, and relating to regulatory agencies.

III. Monitoring/mapping and assessment

- a. Expand Phase I map of population distribution map of introduced *Spartina* species. (\$15,000)
- b. Conduct monitoring as outlined in the monitoring protocol
- c. Contract Phase II aerial photos

IV. Research

- a. Continue research efforts, monitoring, data evaluation, and report summaries from Phase I, as required.

Deliverables / Phase I

ISEP Monitoring/Mapping/Assessment Plan, ISEP Regional Management and Implementation Plan, Map of *Spartina* population distribution/controlled target populations, slide show, ISEP

information brochure, Permits and Regulatory Requirements Report, Initial Web Site development, CALFED Quarterly Reports

Phase II

Expansion of Web Site, Phase II Revisions to Management and Implementation Plan Demonstration Plot Research Summary and Conclusions, Annual Summary of ISEP actions and results, Phase II Quarterly Reports, Regional Workshop of ISEP Status, Monitoring/Mapping an assessment Phase II Report, Permit Applications and Supporting Documents, Recommendations Restoration Sites Concerning *Spartina*.

e. Inseparable Tasks

ISEP is conceived as the best plan for a successful, cost efficient, comprehensive, regional eradication program. Only essential, integrally linked components have been included. Discussions for alternatives for the plan are presented under Timing and Feasibility.

f. Equipment and Facilities

To optimize available funding, interagency agreements will be drafted shared use of existing or new equipment and facilities. Individual agencies are offering equipment, and facilities as in-kind cost sharing contributions..

g. Location and Geographic Boundaries

The geographic boundaries include the baylands of North/South/Suisun Bays and lower Delta. Counties included are Sacramento, Solano, Contra-Costa, Alameda, Santa Clara, San Mateo, San Francisco, Marin, Napa and Sonoma.

h. Geographic Location Map: See Figure 1.

V. Ecological/Biological Benefits

a. Ecological /Biological Benefits.

ISEP reasonably assumes that if introduced *Spartina* is eradicated, it will eliminate the threat to thousands of acres of uninvaded habitat, including future restoration sites. Additionally, current degradation of habitat can be halted and reversed.

b. Alternative approaches

Individual agencies, as in the past, can start eradication programs. This results in costly duplication of efforts that include separate project funding, environmental compliance and permitting, research, testing of control methods, public outreach, and providing project justification to agency administrators. The high costs associated with individual efforts makes the commitment for long-term management difficult. Reinvasion is imminent in controlled areas without the coordination of control efforts on nearby infestations.

A discussion of the benefits of a regionally coordinated eradication program over a limited control plan is presented under the Timing and Feasibility of Project section.

c. Expected benefits.

Expected benefits are a significant reduction or elimination of the following negative ecological and economic impacts associated with the invasion of introduced *Spartina* species:

- Degradation of habitat the federally and state endangered California clapper rail, California black rail, salt marsh harvest mouse (J. Albertson, USFWS, pers. comm.) and soft birds beak (P. Baye, USFWS pers. comm).
- Hybridization with native *S. foliosa* (Ayres et al. in press).
- Physical alteration of the wetlands due to greater sediment accretion and stabilization (Grossinger et al. 1998, Sayce 1988, Dahler and Strong 1996).
- Loss of shorebird feeding habitat and unvegetated mudflat (Gross-Custard and Moser 1988, G. Page, Point Reyes Bird Observatory).
- Displacement of native flora (Daehler and Strong 1996).
- Tidal marsh restoration projects may be particularly vulnerable to invasion because they present an unvegetated, mid-intertidal surface (Alexander, 1997).
- Negative third party impacts include clogging of navigable waterways, increased need mosquito abatement measures, decrease of flood control channel capacity, and aesthetic loss of the native marsh/mudflat landscape.

Elimination of the above associated impacts of introduced *Spartina* invasions will protect and preserve the 40,000 acres of tidal wetland and 29,000 acres of tidal flat (SFEP 1996) in the San Francisco Bay estuary.

d. Durability of Benefits

The benefits of eradicating introduced *Spartina* species are lasting. There is no likelihood of the reintroduction of *Spartina* species given the current awareness of introduced species coupled with specific ISEP outreach to land managers and restoration project managers.

e. Linkage with Past Projects

ISEP evolved from the efforts and actions of a few local land management agencies (East Bay Regional Park District, Don Edwards S.F. Bay National Wildlife Refuge, County of Alameda Flood Control) that recognized the seriousness of the negative economic and ecological impacts associated with introduced *Spartina* and the urgency to prevent further spread. ISEP uses existing expertise, successful control methodologies, genetic knowledge, field operation logistical experience, acknowledged research needs, and an established network of public involvement. Existing eradication programs will be incorporated into ISEP. SFEI will update maps produced with CALFED funding for their wetlands invasive species report in 1998.

f. Linkage to ERP Action and Goals

- Reduce the negative biological and economic impacts of established non-native

- species. (CALFED identified stressor, funding priority #5)
- Benefit migrating neotropical birds, aid the recovery of four special status species including the endangered California clapper rail, California black rail, salt marsh harvest mouse, and one Delta special status plant species, soft birds-beak. (Target species)
- ISEP would improve conditions that support increased and secondary productivity that would support efforts to increase and protect Tidal Perennial Aquatic Habitat
- Prevent the potential spread of introduced *Spartina* to approximately 40,000 acres of wetland and 29,000 acres of tidal mudflat in the San Francisco Bay estuary to prevent degradation of saline emergent aquatic habitat.

g. System -Wide Ecosystem Benefits

- ISEP significantly reduces a population of Invasive Aquatic Plants, a CALFED identified stressor.
- ISEP insures that future restoration projects will go forward with the primary objective of creating habitat to aid the recovery of priority and special status species.
- ISEP addresses CALFED objectives regarding Bay-Delta Aquatic Food Web/Ecosystem Processes. ISEP will prevent and reduce degradation to unvegetated tidal mudflats. These areas are sites of secondary productivity. ISEP will protect a critical link in the nutrient cycling of the estuary.

h. Compatability with Non-Ecosystem Objectives

Spartina is clogging flood control channels. ISEP will provide non structural flood control benefits by restoring the flow capacity of the channels.. Other third party benefits include maintenance of navigable waterways, prevention of increased mosquito abatement measures, and preservation of the aesthetic value of the native salt marsh landscape.

VI. Technical Feasibility and Timing

Once an exotic invasive weed has become established and is spreading, there are three options: 1) do nothing and hope the spread will be limited by environmental constraints before catastrophic economic and ecological damage occurs; 2) undertake a protracted (usually indefinite) "management" program to slow the spread; or 3) commit to an eradication program with clear goals and a feasible strategy. It is clear from historic spread in the Bay/Delta and in Washington State that option #1 would be irresponsible. Furthermore, populations of introduced *Spartina* allowed to remain represent threats to neighboring states (Oregon) and marshes in southern California. Option #2 actually means "living" with a constantly dispersing species and the likelihood of long-distanced spread (even outside the Bay/Delta) to more southern and northern California tidelands and the lower Sacramento/San Joaquin Delta.

If there were no previously successful control operations demonstrated, one might justify a "holding" or management mode while various methodologies could be tested (e.g. mechanical, herbicidal). However, there is ample data from Washington State and from recent small-scale tests on existing San Francisco populations to indicate that control is attainable with optimization and integration of methods. In addition, the existing on-the-ground actions have laid the foundation for an expanded program because many practical constraints have already been identified. These include timing of flowering, timing of clapper rail nesting, physical access to populations and limitations on equipment. This, coupled with the obvious successful dispersal of seedlings hundreds of yards from existing stands strongly points to the feasibility of a full eradication mode for several specific reasons:

- 1) The current population occupies a very small percentage of the total available habitat that can be invaded.
- 2) Prevention of dispersal is feasible with existing registered herbicides and focused physical removal.
- 3) A fully integrated eradication program will have clearly definable goals, quantifiable progress and milestones, engage the public with both educational components and environmental stewardship actions.
- 4) An eradication program offers the only option that can result in a reduced cost over time when the exotic *Spartina* is gone.
- 5) Once established, eradication programs are inherently less problematic since the "level" of management or simple "containment" cannot become a debatable (and therefore divisive) issue. Although the time required to achieve the goal is not entirely predictable, the general strategy of preventative actions (to stop re-infestation) coupled with blocking dispersal and gradual reduction of established populations lead to an end-point. This project's three year scope provides for reasonable and measurable milestones as well as opportunities for adjustments through adaptive management.

VII. Monitoring and Data Collection Methodology

The mapping/monitoring/assessment component of ISEP will provide essential quantitative and geographical information regarding acreage of invasion, rates of spread, population distribution, hybridity distribution, and will demonstrate regional progress towards control of *Spartina*. Several types of mapping will be accomplished. A regional scale map to produce up-to-date templates for coordinating control efforts, especially with regard to outlier populations. Additionally, a higher resolution map will be produced to measure the effects of control at specific targeted sites.

To support these mapping needs, the San Francisco Estuary Institute will contribute the Bay Area EcoAtlas as a regional GIS for base maps. This will make possible the geo-rectification of local aerial photography and the measurement and illustration of regional as well as local change over time.

Regional condition would be illustrated in both a "point" map and plan form. The point map previously created by SFEI for their report on wetlands invasive plants sponsored last year by CalFed would be updated. The plan form would outline local colonies, for all the colonies in a region. This map would provide for regional acreage figures and local view of distribution for every location in the region. Field personnel would "sketch" colonies onto the EcoAtlas base map, printed out at any scale necessary. These maps would then serve as field sheets.

SFEI will also implement a monitoring plan areas targeted for control. Protocols for this will be developed in Phase I.

VII. Local Involvement

a. County Notification

1. Joe Canciamilla, Chair, Contra-Costa County. 2. Dennis Barry, AICP Director, Contra-Costa County, 3. Margit Aramburu, Director, Delta Protection Commission, 4. Robert Tufts, Chair, S.F. Bay Conservation and Development.

Team *Spartina* members: Joan Suzio (EBRPD), Mark Taylor (EBRPD), Peter Alexander (EBRPD), Steven Bobzien (EBRPD), Heather Dempsey (NFWF), Ray Carruthers (USDA), Joy Albertson (USFWS), Deborah Bartens (City of Palo Alto), Michelle Wagner (City of Palo Alto), Ginny Kaminski (Shoreline at Mountain View), Andree Breaux (SF Regional Water Quality Control Board), Carl Wilcox (CDFG), Karl Malamud-Roam (Contra-Costa Mosquito and Vector Control), Tom dudley (UC Berkeley), Phil Greer (Wetlands Research Associates) Nadine Hitchcock (California Coastal Conservancy), Robin Grossinger (SFEI) Josh Collins (SFEI) Dr. Don Strong (UC Davis) Dr. Debra Ayres (UC Davis), Dr. Lars Anderson (USDA)

IX. Costs

- a. See Table 1 ISEP Budget Summary
- b. See Table 2 ISEP Total Budget
- c. See Table 3 ISEP ISEP Quarterly Summary

X. Cost Sharing

California Coastal Conservancy \$125,000 committed for year 1
California Dept. Of Fish and Game \$16,500/ anticipated commitment for years 1-3.

The following agencies are anticipating contributing the following in-kind contributions pending implementation of ISEP:

East Bay Regional Park District	Biologist	\$10,000
	IPM Specialist	\$10,000
	Park Supervisors	\$10,000
	Facilities	\$20,000
	Equipment	<u>\$20,000</u>
	Total	\$70,000
San Francisco Estuary Institute	Personnel/Equip.	\$40,000

ISEP Budget Summary

Table 1.

Task/Subtask	Direct Labor Hours	Direct Salary & Benefits	Service Contracts	Materials & Acquisitions	Misc./other Direct Costs	Overhead & Indirect Costs	Total Costs
Project Administration							
Phase I	17,240	4,310	0	0	0	0	21,550
Phase II year 2	22,000	5,500	0	0	0	0	27,500
Phase II year 3	22,000	5,500	0	0	0	0	27,500
Total	61,240	15,310	0	0	0	0	76,550
Project Management							
Phase I	0	0	74,750	0	14,050	5,600	94,400
Phase II year 2	0	0	82,500	0	5,350	9,800	97,650
Phase II year 3	0	0	82,500	0	5,350	9,800	97,650
Total	0	0	239,750	0	24,750	25,200	289,700
Operations							
Phase I	0	0	106,000	32,000	29,000	0	167,000
Phase II year 2	0	0	758,000	97,000	5,000	0	860,000
Phase II year 3	0	0	758,000	7,000	5,000	0	770,000
Total	0	0	1,622,000	136,000	39,000	0	1,797,000
Public Outreach							
Phase I	0	0	11,250	0	3,000	0	14,250
Phase II year 2	0	0	14,500	0	0	0	14,500
Phase II year 3	0	0	8,500	0	0	0	8,500
Total	0	0	34,250	0	3,000	0	37,250
Environmental Compliance							
Phase I	0	0	6,800	0	0	0	6,800
Phase II year 2	0	0	310,000	0	0	0	310,000
Phase II year 3	0	0	20,000	0	0	0	20,000
Total	0	0	336,800	0	0	0	336,800
Mapping and Monitoring							
Phase I	0	0	11,200	0	9,800	0	21,000
Phase II year 2	0	0	35,000	0	18,000	0	53,000
Phase II year 3	0	0	35,000	0	18,000	0	53,000
Total	0	0	81,200	0	45,800	0	127,000

ISEP Budget Summary

Table 1.

Research							
Phase I	0	0	50,000	0	0	0	50,000
Phase II year 2	0	0	100,000	0	0	0	100,000
Phase II year 3	0	0	100,000	0	0	0	100,000
Total	0	0	250,000	0	0	0	250,000
Total Budget							
Phase I	17,240	4,310	260,000	32,000	55,850	5,600	375,000
Phase II year 2	22,000	5,500	1,300,000	97,000	28,350	9,800	1,462,650
Phase II year 3	22,000	5,500	1,004,000	7,000	28,350	9,800	1,076,650
Total	61,240	15,310	2,564,000	136,000	112,550	25,200	2,914,300

ISEP Total budget

Table 2.

Task/Subtask	Direct Labor Hours	Direct Salary & Benefits	Service Contracts	Materials & Acquisitions	Misc./other Direct Costs	Overhead & Indirect Costs	Total Costs
Phase I							
Project Administration	17,240	4,310					21,550
Project Management							
a. Establish regionally coordinated structure			7,400	0	13,750	5,600	26,750
b. Identify, notify, assist land owners			11,750				11,750
c. ISEP Management and Implementation Rprt			9,000				9,000
d. Equip. Spec./identify operation needs			4,500				4,500
e. Survey North Bay for outlying populations			3,700	0	300	0	4,000
f. Annual ISEP Status Report			1,200				1,200
g. Develop Rapid Response Protocol/Team			6,200				6,200
h. Convene advisory panel			2,000				2,000
i. Assist landowners with control operations			29,000				29,000
Subtotal	0	0	74,750	0	14,050	5,600	94,400
Operations							0
a. Equip. Spec.			1,000				1,000
b. Purchase Equipment				32,000	0	0	32,000
c. Populations North of Bay Bridge			30,000				30,000
d. Control of Target Populations			71,000				71,000
e. Equipment rental (helicopter)					15,000		15,000
f. Equipment maintenance					14,000		14,000
g. Genetic testing			4,000				4,000
Subtotal	0	0	106,000	32,000	29,000	0	167,000
Public Outreach							
a. ISEP Outreach Plan			1,500				1,500
b. Initial web site dev.			8,000				8,000
c. Spartina Alert			500				500
d. ISEP Slide Pres.			250				250
e. ISEP Info Brochure			1,000		3,000		4,000
Subtotal	0	0	11,250	0	3,000	0	14,250

ISEP Total budget

Table 2

Task/Subtask	Direct Labor Hours	Direct Salary & Benefits	Service Contracts	Materials & Acquisitions	Misc./other Direct Costs	Overhead & Indirect Costs	Total Costs
Phase II year 2							
Project Administration	22,000	5,500					27,500
Project Management							0
a. Expand regionally coordinated structure			7,400		5,350	9,800	22,550
b. Identify, notify, assist land owners			8,500				8,500
c. Revised Management Plan			9,000				9,000
d. Equip. Spec./identify operation needs			4,500				4,500
e. Survey North Bay for outlying populations			3,700				3,700
f. Annual ISEP Status Report			1,200				1,200
g. Develop Rapid Response Protocol/Team			6,200				6,200
h. Convene advisory panel			2,000				2,000
i. Assist landowners with control operations			40,000				40,000
Subtotal			82,500	0	5,350	9,800	97,650
Operations							
a. Equip. Spec.			3,000				3,000
b. Purchase Equipment			0	97,000	5,000	0	102,000
c. Expanded control of Spartina populations			700,000				700,000
d. Equipment rental (helicopter)			30,000				30,000
e. Equipment maintenance			20,000				20,000
f. Genetic testing			5,000				5,000
Subtotal	0	0	758,000	97,000	5,000	0	860,000
Public Outreach							
a. Implement Phase I Outreach Strategy			5,500				5,500
b. Web Site Expansion and Maintenance			9,000				9,000
Subtotal			14,500	0	0	0	14,500
Environmental Compliance							
a. Prepare CEQA/NEPA requirements			300,000				300,000
b. Clapper Rail Surveys			10,000				10,000
Subtotal			310,000	0	0	0	310,000

ISEP Total budget

Table 2

Task/Subtask	Direct Labor Hours	Direct Salary & Benefits	Service Contracts	Materials & Acquisitions	Misc./other Direct Costs	Overhead & Indirect Costs	Total Costs
Phase II year 3							
Project Administration	22,000	5,500					27,500
Project Management							0
a. Expand regionally coordinated structure			7,400		5,350	9,800	22,550
b. Identify, notify, assist land owners			8,500				8,500
c. Revised Management Plan			9,000				9,000
d. Equip. Spec./identify operation needs			4,500				4,500
e. Survey North Bay for outlying populations			3,700				3,700
f. Annual ISEP Status Report			1,200				1,200
g. Develop Rapid Response Protocol/Team			6,200				6,200
h. Convene advisory panel			2,000				2,000
i. Assist landowners with control operations			40,000				40,000
Subtotal			82,500	0	5,350	9,800	97,650
Operations							
a. Equip. Spec.			3,000				3,000
b. Purchase Equipment			0	7,000	5,000	0	12,000
c. Expanded control of Spartina populations			700,000				700,000
d. Equipment rental (helicopter)			30,000				30,000
e. Equipment maintenance			20,000				20,000
f. Genetic testing			5,000				5,000
Subtotal	0	0	758,000	7,000	5,000	0	770,000
Public Outreach							
a. Implement Phase I Outreach Strategy			5,500				5,500
b. Web Site Expansion and Maintenance			3,000				3,000
Subtotal			8,500	0	0	0	8,500
Environmental Compliance							
a. Permitting			10,000				10,000
b. Clapper Rail Surveys			10,000				10,000
Subtotal			20,000	0	0	0	20,000

ISEP Total budget

Table 2

Task/Subtask	Direct Labor Hours	Direct Salary & Benefits	Service Contracts	Materials & Acquisitions	Misc./other Direct Costs	Overhead & Indirect Costs	Total Costs
Mapping and Monitoring							
a. Expand phase 1 map to South Bay			8,000				8,000
b. Conduct monitoring as in protocol			25,000				25,000
c. Phase II aerial photographs			2,000		18,000		20,000
Subtotal			35,000	0	18,000	0	53,000
Research							
a. Invasion potential model			50,000				50,000
b. Control efficacy			25,000				25,000
c. Control impact			25,000				25,000
Subtotal			100,000				100,000

1-019978

ISEP Quarterly Budget

Table 3

1999-2000					
Tasks year 1	Quarterly Budget	Quarterly Budget	Quarterly Budget	Quarterly Budget	Total Budget
	Jul-Sep 99	Oct-Dec 99	Jan-Mar 00	Apr-Jun 00	
Project Administration	8,080	2,695	8,080	2,695	21,550
Project Management	23,600	23,600	23,600	23,600	94,400
Operations	104,000	21,000	21,000	21,000	167,000
Public Outreach	1,000	4,416	4,416	4,418	14,250
Environmental Compliance	0	0	6,800	0	6,800
Mapping and Monitoring	9,000	9,000	1,500	1,500	21,000
Research	6,250	6,250	6,250	6,250	25,000
Total	151,930	66,961	71,646	59,463	350,000
2000-2001					
Tasks year 2	Quarterly Budget	Quarterly Budget	Quarterly Budget	Quarterly Budget	Total Budget
	Jul-Sep 00	Oct-Dec 00	Jan-Mar 01	Apr-Jun 01	
Project Administration	6,875	6,875	6,875	6,875	27,500
Project Management	24,412	24,412	24,412	24,414	97,650
Operations	847,000	4,333	4,333	4,334	860,000
Public Outreach	4,500	4,500	5,500	0	14,500
Environmental Compliance	300,000	0	10,000	0	310,000
Mapping and Monitoring	13,250	13,250	13,250	13,250	53,000
Research	25,000	25,000	25,000	25,000	100,000
Total	1,221,037	78,370	89,370	73,873	1,462,650
2001-2002					
Tasks year 3	Quarterly Budget	Quarterly Budget	Quarterly Budget	Quarterly Budget	Total Budget
	Jul-Sep 01	Oct-Dec 01	Jan-Mar 02	Apr-Jun 02	
Project Administration	6,875	6,875	6,875	6,875	27,500
Project Management	24,412	24,412	24,412	24,414	97,650
Operations	748,000	7,333	7,333	7,334	770,000
Public Outreach	0	2,833	2,833	2,834	8,500
Environmental Compliance	5,000	2,500	6,250	6,250	20,000
Mapping and Monitoring	13,250	13,250	13,250	13,250	53,000
Research	25,000	25,000	25,000	25,000	100,000
Total	822,537	82,203	85,953	85,957	1,076,650

have approximately 300 acres of exotic *Spartina*. She has presented her work at major public meetings, coordinated local experts to examine the impacts of this invasive species, conducted field survey, provided logistical planning, and initiated and collaborated with UC Davis on control efficacy experiments.

Joshua N. Collins, Ph.D., will be the science coordinator for the mapping, monitoring, and data evaluation components. He is an environmental scientist with the San Francisco Estuary Institute, where he leads the programs in wetlands and watersheds. He was the science coordinator for the Bay Area Wetlands Ecosystem Goals Project, and lead author of the Bay Area Watersheds Science Plan. His scientific publications include refereed papers and reports on the evolution and natural maintenance of tidal marshlands, the ecology of perennial and seasonal palustrine wetlands, mosquito control, and environmental planning.

Robin Grossinger is an Assistant Environmental Scientist with the San Francisco Estuary Institute. He is working under the direction of Joshua Collins on the collection, assessment, and integration of environmental data as part of the wetland and watershed program at the Institute. His recent focus has been as technical director of the Bay Area Eco-Atlas, where he supervised the development of detailed regional GIS of environmental data for the baylands. For several years, he has been involved in research and coordination of work on introduced *Spartina*, which lead to the development of the first regional map of introduced *Spartina* and the publication of *Introduced Tidal Marsh Plants in the San Francisco Estuary*.

Donald R. Strong, Ph.D., will co-lead lead the research committee. He is a population biologist and currently a Professor of Evolution and Ecology at UC Davis and Bodega Marine Laboratory. His current research efforts pertain to biological control of *Spartina alterniflora* in Willapa Bay, Washington, and in eradication of alien cordgrasses from California waters. He is the author of over 100 scientific publications, including several on the control and hybridization between exotic and native *Spartina*.

Debra Ayres, Ph.D., is an ecologist doing post doc research under Dr. Don Strong. She conducts research in the *Spartina* lab and focuses on combining molecular biology with field and greenhouse observations to understand a hybridization phenomena occurring between a native and an introduced cordgrass in the San Francisco Bay marshes

Lars W.J. Anderson, Ph.D., will co-lead the research committee. He is a plant physiologist and currently the lead scientist for the Exotic and Invasive Research Unit of the USDA-ARS Aquatic Weed Research Laboratory. His research and publications pertain to the biology, ecology and management of aquatic weeds, with particular focus on reproduction and invasiveness of exotic species in a manner that will reduce the use, dependence, and risk of herbicides. The Laboratory serves as the primary extension contact point for the State of California and other western states and provides expertise in aquatic plant identification, management and eradication.

XII. Compliance with Standard Terms and Conditions

See attached letter from Marcia Grimm, Senior Staff Council for the Coastal Conservancy.

California Coastal Conservancy	Facilities	\$10,000
	Office Supplies	<u>\$ 5,000</u>
		\$15,000
UC Davis	Facilities	\$10,000
USDA Agricultural Service	Personnel	\$ 9000
	Facilities	\$ 4000
	Equipment	<u>\$10000</u>
		\$23000
USFWS	Personnel	\$20,000
	Facilities	\$10,000
	Equipment	<u>\$10,000</u>
		\$40,000
Alameda County Flood Control	Personnel	\$20,000
	Equipment	<u>\$60,000</u>
		\$80,000
Team <i>Spartina</i>	Personnel	\$ 15,000
	Total/yr	\$293,000
	<u>Total in-kind / 3 yrs.</u>	<u>\$879,000</u>

XI. Applicant Qualifications:

a. Participant Qualifications

Nadine Hitchcock will manage the administration of the grant for the applicant agency and for the subcontractors. She is an environmental planner with over 14 years experience as a project manager with the Coastal Conservancy. She is currently the manager of the San Francisco Bay Area Conservancy Program. She has managed several large-scale wetlands restoration projects involving multiple agencies and nonprofit organizations. She is currently project manager for the US COE Napa Salt Marsh Restoration Feasibility Study, the Lower Napa River Enhancement and Public Access Plan, and the Napa River Flood Protection and Wetland Enhancement Plan.

Debra Smith: Is the Coordinator for the Introduced *Spartina* Project for the East Bay Regional Parks (EBRPD). EBRPD is a land management agency which oversee the stewardship of over 85,000 acres in Alameda and Contra-Costa County. She has produced a comprehensive management plan for Introduced *Spartina* for the EBRPD regional shorelines which currently



Project Area: San Francisco Bay Region

Bounding coordinates:

XMIN, YMIN: 123 1 21.605599, 37 1 44.831129

XMAX, YMAX: 121 20 25.188251, 38 39 19.291128

Figure 1. Target and Threatened Areas



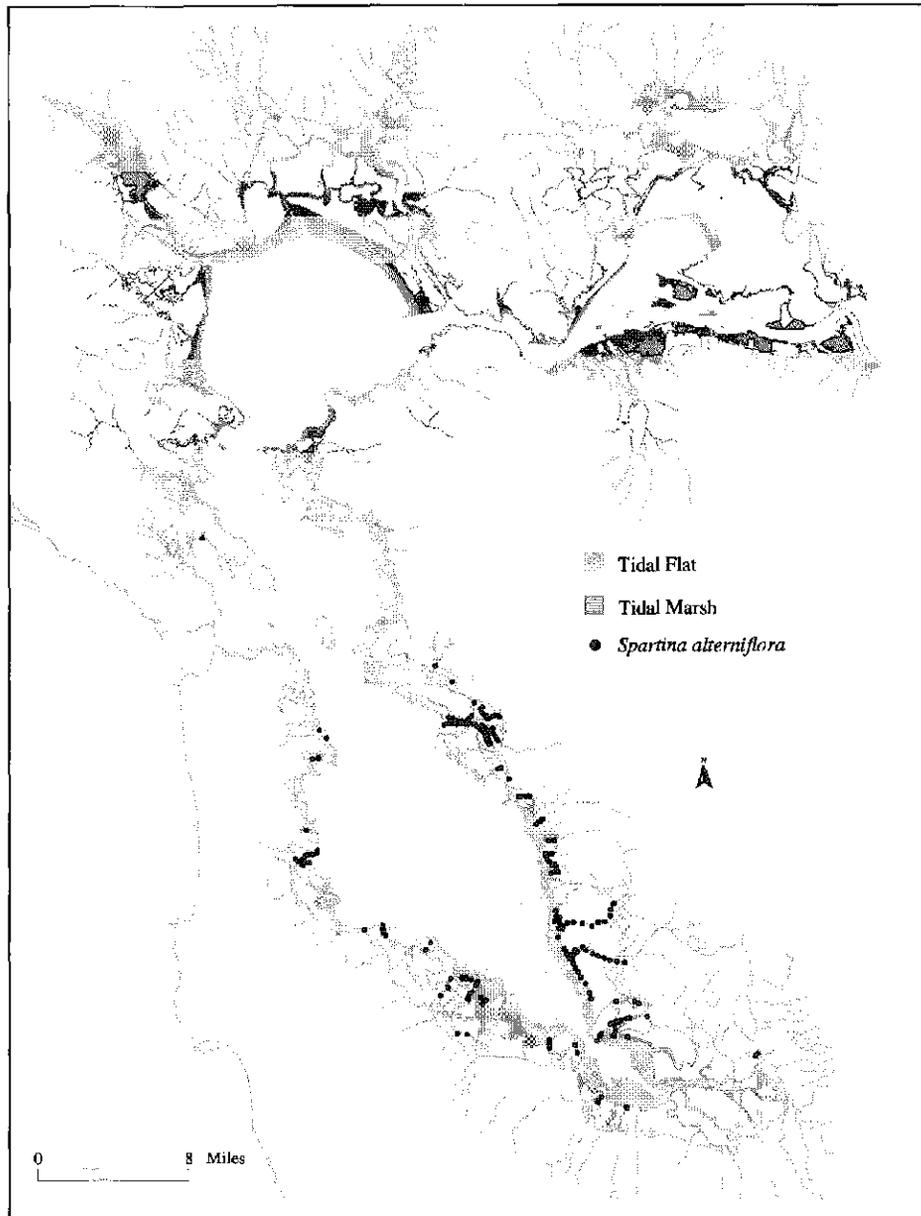


Figure · *Spartina alterniflora*

Compiled by the SFEL, 1998 (Basemap: Bay Area EcoAtlas Version 1.50)

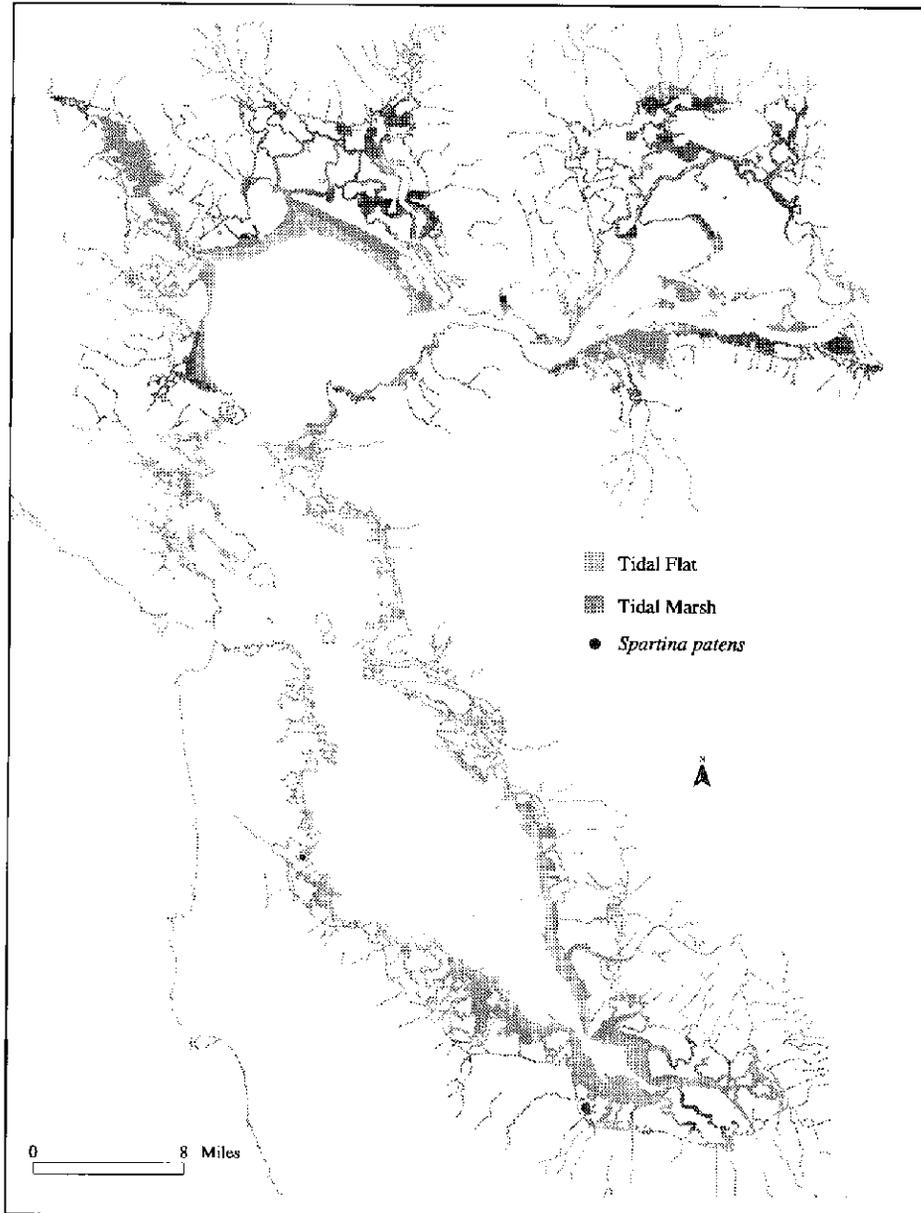


Figure *Spartina patens*

Compiled by SFBI, 1998 (Basemap: Bay Area EcoAtlas Version 1.50)



Figure *Spartina densiflora*

Compiled by the SFEL, 1998 (Basemap: Bay Area EcoAtlas Version 1.50)

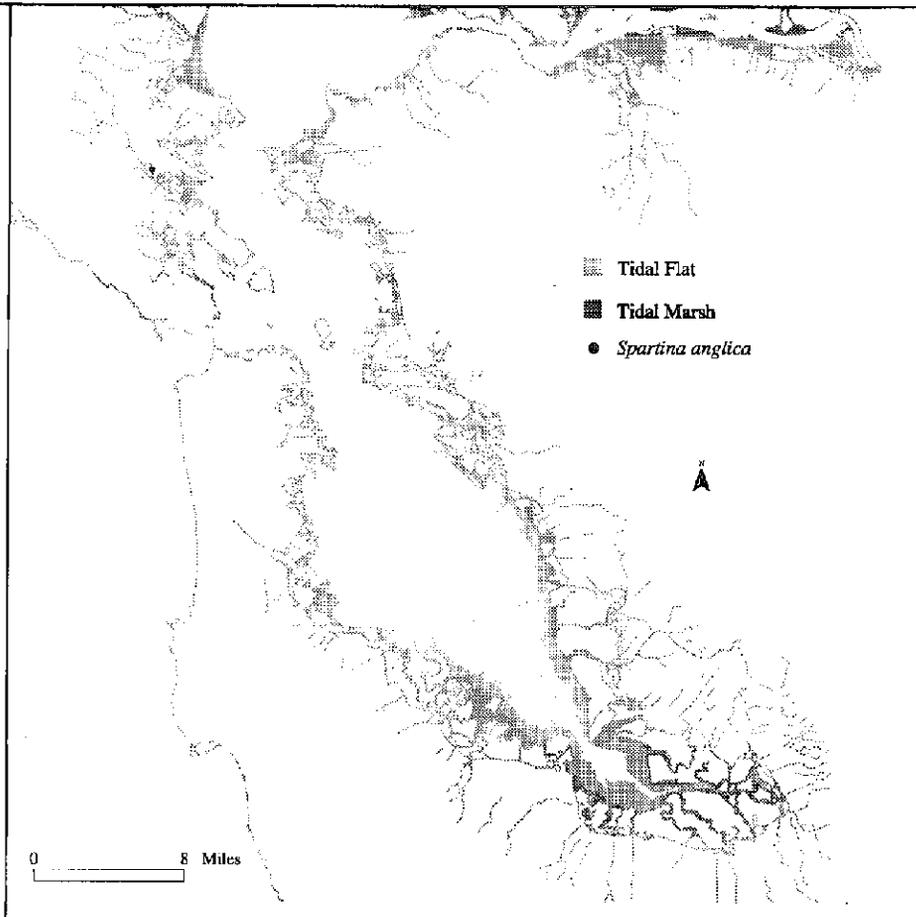


Figure *Spartina anglica*

Compiled by SFEL, 1998 (Basemap: Bay Area EcoAtlas Version 1.50)

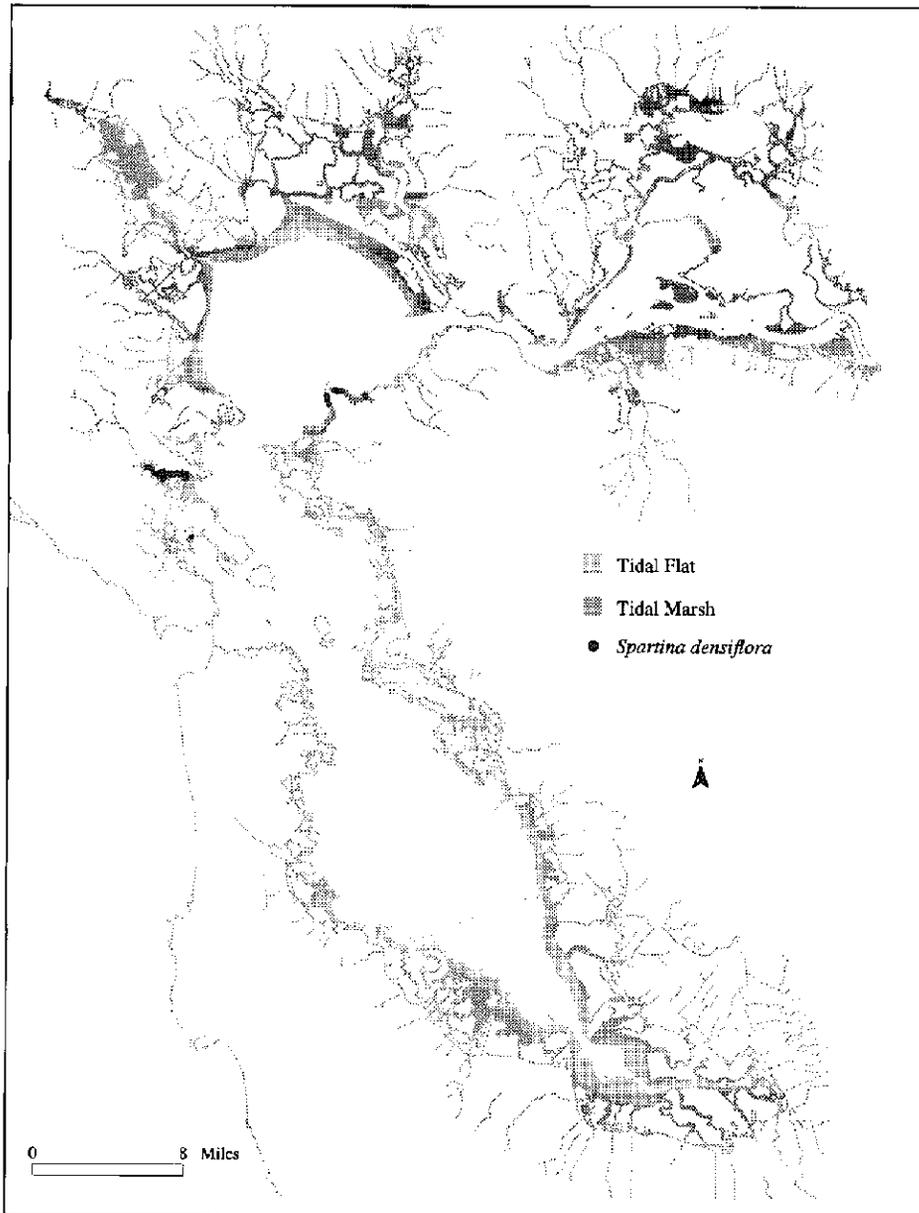
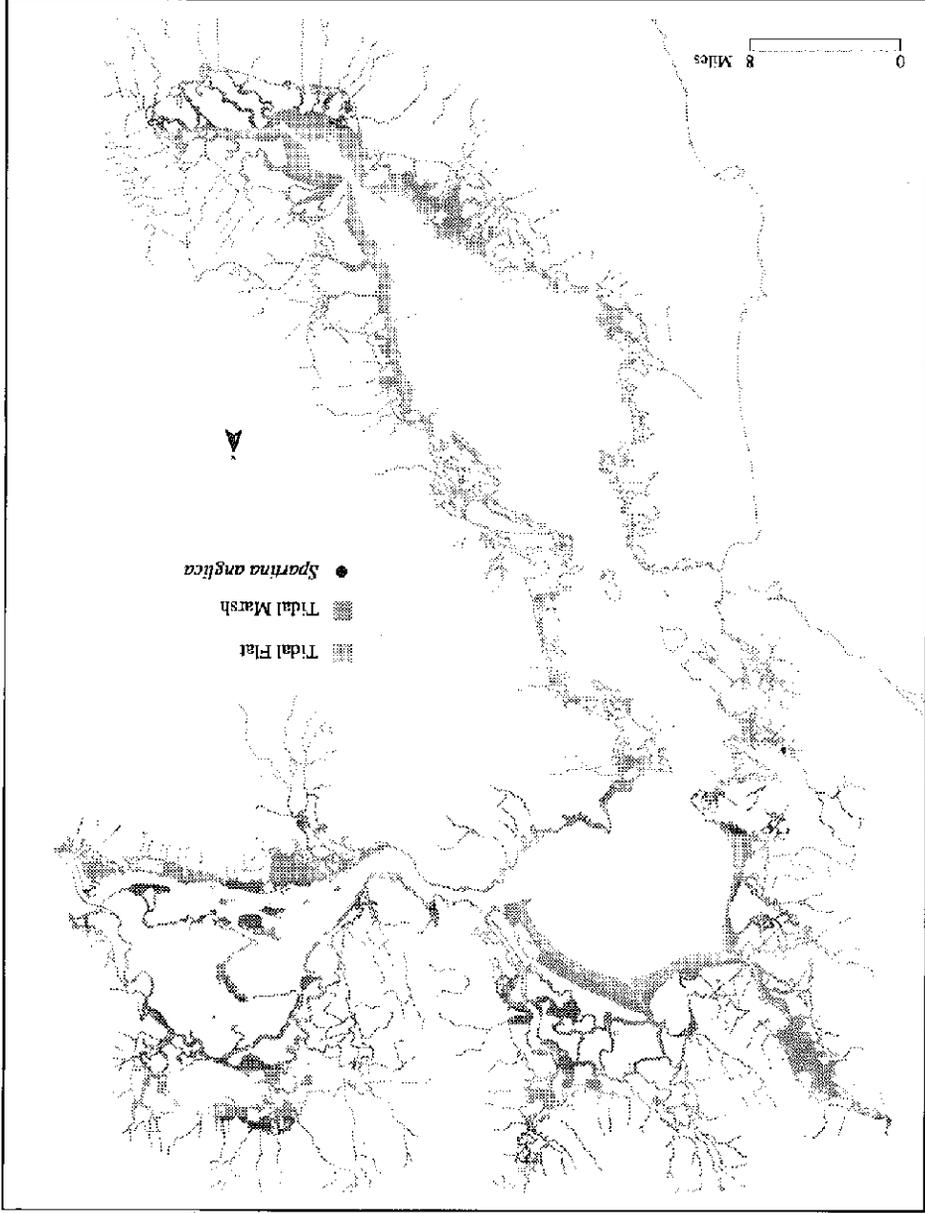


Figure *Spartina densiflora*

Compiled by the SFEI, 1998 (Basemap: Bay Area EcoAtlas Version 1.50)



Compiled by SFEI, 1998 (Basemap: Bay Area Localities Version 1.50)

Figure *Spartina anglica*

San Francisco Estuary Institute



189 Richmond Field Station
1325 South 46th Street
Richmond, California 94804
Office (510) 231-9639
Fax (510) 231-9414

April 15, 1999

Supervisor Joe Canciamilla, Chair
County of Contra Costa
Board of Supervisors
651 Pine Street
Martinez, CA 94553

Dear Supervisor Canciamilla:

Per instructions stated in the CALFED Bay-Delta Program, February 1999 Proposal Solicitation Package, this letter serves to notify you of our intent to submit the project proposal entitled "The Introduced *Spartina* Eradication Project".

If you have any questions, please contact me.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Margaret R. Johnston', is written over a faint, larger version of the same signature.

Margaret R. Johnston
Executive Director

San Francisco Estuary Institute



180 Richmond Field Station
1325 South 48th Street
Richmond, California 94804
Office (510) 231-9539
Fax (510) 231-9414

April 15, 1999

Dennis M. Barry, AICP, Director
County of Contra Costa
Community Development Department
651 Pine Street
North Wing - 4th Floor
Martinez, CA 94553

Dear Mr. Barry:

Per instructions stated in the CALFED Bay-Delta Program, February 1999 Proposal Solicitation Package, this letter serves to notify you of our intent to submit the project proposal entitled "The Introduced *Spartina* Eradication Project".

If you have any questions, please contact me.

Very truly yours,

A handwritten signature in black ink, appearing to read "Margaret Johnston".

Margaret R. Johnston
Executive Director

San Francisco Estuary Institute

**180 Richmond Field Station**

1325 South 46th Street
Richmond, California 94804
Office (510) 231-9539
Fax (510) 231-9414

April 15, 1999

Margit Aramburu, Director
Delta Protection Commission
14215 River Road
P. O. Box 530
Walnut Grove, CA 95690

Dear Ms. Aramburu:

Per instructions stated in the CALFED Bay-Delta Program, February 1999 Proposal Solicitation Package, this letter serves to notify you of our intent to submit the project proposal entitled "The Introduced *Spartina* Eradication Project".

If you have any questions, please contact me.

Very truly yours,

Margaret R. Johnston
Executive Director



DATE: April 15, 1999
TO: CalFed Bay-Delta Program
FROM: Marcia Grimm *M. Grimm*
Senior Staff Counsel
RE: Coastal Conservancy Compliance with Contractual Terms and Conditions

I have reviewed relevant provisions of the CalFed Bay-Delta Program's Ecosystem Restoration Projects and Programs Proposal Solicitation Package, dated February 1999, with respect to the application submitted by the State Coastal Conservancy, a California state agency. The Coastal Conservancy is agreeable to, and able to comply with, terms and conditions included in Attachment D of the Proposal Solicitation Package except as follows: (1) the Conservancy would revise or exclude Paragraph 9 in the "Attachment D Terms and Conditions", requiring it to indemnify, defend and save harmless the Resources Agency and the State because the Conservancy is itself an agency of the State within the Resources Agency. (2) The Conservancy would revise or exclude Paragraph 10 in the "Attachment D Terms and Conditions", because agents and employees of the Conservancy are, in fact, officers and employees or agents of the State of California.

The standard contract clauses included in the remainder of Attachment D and in Attachment E appear to be provisions that we can agree to and/or incorporate in any subcontracts for the use of CalFed funds, to the extent applicable to the project proposed.

1330 Broadway, 11th Floor
Oakland, California 94612-2530
510-286-1015 Fax: 510-286-0470



United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay National Wildlife Refuge Complex
P.O. Box 524
Newark, California 94560-0524
(510) 792-0222

April 8, 1999

Nadine Hitchcock
Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, California 94612

Dear Ms. Hitchcock:

This letter is in reference to current and future control efforts for exotic cordgrass species (*Spartina* spp.) in the San Francisco Bay Estuary. We are writing to convey our support for organization and funding of a Bay-wide program to conduct control and research activities for four exotic cordgrass species.

The San Francisco Bay National Wildlife Refuge Complex has been conducting limited control activities for exotic smooth cordgrass (*Spartina alterniflora*) on the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) in south San Francisco Bay tidal marshes since 1994. Additionally, the Refuge has been cooperating with the County of Alameda-Public Works Agency and the East Bay Regional Parks District to manage exotic cordgrass in certain East Bay marshes since 1995. Because of limited resources, our efforts have resulted in only localized reductions of exotic smooth cordgrass.

The Refuge recognizes the importance of establishing a Bay-wide control effort to eliminate existing infestations and prevent the further spread of exotic cordgrass species in the San Francisco Bay estuary. Without a large, coordinated effort, control or eradication of these species will be ineffective and re-infestation of controlled areas will be unavoidable. All major landowners and management agencies with marshland properties must be involved in this effort to ensure success.

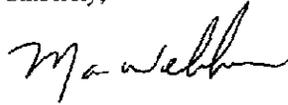
Control of exotic cordgrass species is necessary to protect the remaining tidal marshes in the San Francisco Bay estuary for the benefit of endemic endangered species such as the California clapper rail (*Rallus longirostris obsoletus*) and the salt marsh harvest mouse (*Reithrodontomys raviventris*). Mudflats must be also protected from infestation, as exotic cordgrass species would reduce the amount of foraging habitat available to migrating and wintering shorebirds and waterfowl which depend on the San Francisco Bay estuary for this resource.

In the absence of a major control effort, much of the remaining marshland will probably become

infested with exotic cordgrass. This will drastically alter the vegetative composition of marshes and change marsh hydrology. Information gathered from Washington State, which has a large-scale infestation of *Spartina alterniflora*, predicts that without immediate initiation of extensive control efforts, we could expect large-scale conversion of tidal flats to homogenous stands of exotic cordgrass.

The Refuge strongly supports San Francisco Bay-wide exotic cordgrass control efforts. If you have any questions, please contact Joy Albertson, of my staff, at (510)792-0222.

Sincerely,

A handwritten signature in black ink, appearing to read "Marc Webber". The signature is fluid and cursive, with the first name "Marc" being more prominent than the last name "Webber".

Marc Webber
Deputy Project Leader

REGIONAL PARKS

EAST BAY REGIONAL PARK DISTRICT



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Pat O'Brien
General Manager

April 13, 1999

Ms. Nadine Hitchcock
California Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, CA 94612

Dear Ms. Hitchcock,

East Bay Regional Park District (EBRPD) is pleased to support the California Coastal Conservancy's application to CALFED for *Spartina* Eradication on San Francisco Bay.

The District initiated a *Spartina* control program in 1996 to address degradation being caused by *Spartina* species to the three hundred and some acres of tidal wetlands owned and/or managed by EBRPD. These wetlands include two recently restored sites, Cogswell Marsh and Oro Loma Marsh at Hayward Regional Shoreline.

EBRPD is very much aware of the need to establish a regionally coordinated eradication program to preserve the critical wetland and tidal habitat. The regionally coordinated Introduced *Spartina* Eradication Project (ISEP) being proposed is well conceived with realistic goals and time lines and will bring a strong funding commitment essential for the preservation of wetlands in the San Francisco Bay estuary. The District is looking forward to participating in the program.

I heartily support and strongly urge CALFED to fund the Coastal Conservancy's Introduced *Spartina* Eradication Project.

Sincerely,

Pat O'Brien
General Manager

2950 Peralta Oaks Court P.O. Box 5381 Oakland CA 94605-0381

www.ebparks.com

TDD: 510 633-0460



TEL: 510 635-0135

FAX: 510 569-4319

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I-019995



Winston H. Hickox
Secretary for
Environmental
Protection

California Regional Water Quality Control Board San Francisco Bay Region

Internet Address: <http://www.swrcb.ca.gov>
1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 • FAX (510) 622-2460



Gray Davis
Governor

April 12, 1999

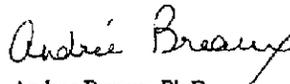
CALFED/Bay Delta Office
1416 9th Street, Suite 1155
Sacramento, CA 95814

Dear CALFED,

Natural resource agencies in the San Francisco Bay interested in the preservation, restoration, creation, and enhancement of wetlands and their associated upland and transitional habitats are faced with a great deal of uncertainty regarding the continued spread of the introduced cordgrass *Spartina alterniflora*. This species, which is native to the Gulf and Atlantic coast wetlands, tends to grow taller, denser, and farther out in the mudflats than the Pacific coast native *Spartina foliosa*, and thus threatens to overtake the native plant species and threaten the native wildlife dependent on *S. foliosa*. The present and long-term effects of *S. alterniflora* on species such as the endangered California Clapper Rail (*Rallus longirostris obsoletus*) are not known, and many questions regarding the future status of this bird and other sensitive tidal marsh species remain unanswered. Some professional botanists have gone so far as to suggest that no new restoration projects in the South Bay should be allowed until *S. alterniflora* is eradicated.

As the resource agencies attempt to rebuild lost and degraded wetlands, we need answers to the questions of whether *S. alterniflora* can be controlled and, if so, what are the best means by which to accomplish this control. Recent reports indicate that *S. foliosa* and *S. alterniflora* are hybridizing, thus making it increasingly difficult to distinguish between the two species. Given the importance of halting the spread of this invasive species as soon as possible, we fully support efforts to control, research, or monitor this invasive species in the San Francisco Bay. If you have any questions, I can be reached at 510-622-2324.

Sincerely,


Andree Breaux, Ph.D.

California Environmental Protection Agency

 Recycled Paper

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