

**Appendix I**  
**ISP First-Year Pilot and Demonstration Projects**

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## San Francisco Estuary Invasive *Spartina* Project Possible First Year Pilot and Demonstration Projects

The Invasive *Spartina* Project (ISP) Control Program has identified 16 locations where it may implement pilot or demonstration projects for the 2003 control season. This list is preliminary in nature, and no site-specific plans have been developed. The Control Program anticipates being able to complete six to ten pilot and demonstration projects during the first year, depending on difficulty identifying and coordinating with landowners and partners.

Following is a summary of each of the possible projects, including the reasons for each project's selection. A map showing the location of the sites follows the descriptions (Figure I-1), and a ranked summary of the criteria by which the projects were selected is provided in Table I-1. Additional projects not identified below may be considered for inclusion in the first year, and projects not completed in the first season may be carried over to the 2004 treatment season.

### 1. Pickleweed Park, Marin County

**Landowner:** City of San Rafael

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** 0.5 acre

**Cordgrass species:** *S. densiflora*

**Possible project partners:** City of San Rafael, Marin County Weed Management Area

**Endangered species and other site issues:** California clapper rails are *not* known to be present at this site.

**Control Work/details:** *S. densiflora* control at this site may include a combination of digging, mowing, covering and herbicide depending on landowner and community opinion. USDA-ARS researchers working for the ISP may propose work at this location to examine efficacy of new *S. densiflora* control methods, including alternative herbicides (such as fluridone and imazypyr) and application of herbicide to cut plant stumps.

**Reason for selection as a possible demonstration site:** ISP surveys identified discrete *S. densiflora* clones along the bay front of Pickleweed Park in 2001. Pickleweed Park is the northern most infestation of *S. densiflora*. Control at this site could contain this northern population and reduce the overall distribution and potential dispersal of *S. densiflora*.

California clapper rail has not been reported in this area, so work could be initiated early in the season when there are numerous low morning tides. Early initiation of work would allow for repeat visits to the site for improved effectiveness.

## 2. Corte Madera Creek, Marin County

**Landowner:** The infestation at Corte Madera Creek extends along the length of the Creek to the San Francisco Bay, and so affects numerous public and private landowners. Specific landowners involved in the demonstration project would be known only when the exact demonstration site was selected.

**Contact:** Sandy Guldman, Friends of Corte Madera Creek

**Site location:** See attached map.

**Acres to be treated:** Approximately 1 of 13 total infested acres

**Cordgrass Species:** *S. densiflora*

**Possible project partners:** Marin County Parks and Recreation Department, Friends of Corte Madera Creek, Marin Rowing Association, Marin County Open Space, City of Larkspur/Corte Madera?

**Endangered species and other site issues:** The local community may be very sensitive about the use of herbicides in this area. California clapper rails have been reported in the area, and surveys for clapper rail must be completed prior to selection of the demonstration site. Control work in areas occupied by clapper rails could occur only as authorized by the USFWS.

**Control Work/details:** Portions of the site would be suited for a variety of physical and mechanical control such as digging and hand pulling, and other areas would be most effectively and efficiently treated with herbicides. Demonstration work could begin with physical and mechanical control in the upper reach of the infestation.

**Reason for selection as a possible demonstration site:** Creekside Park and Corte Madera Creek comprise the bulk of the *S. densiflora* population of the San Francisco Estuary. *S. densiflora* was introduced at Creekside Park in Marin County in the mid-1970s during the marsh restoration of this site. In the 30 years since its introduction at Creekside Park, *S. densiflora* has spread to the banks of the Corte Madera Creek, adjacent marsh edges, the Corte Madera Creek mouth, and the bay front of the Corte Madera Marsh Reserve. Propagules from this source population are continuing to be spread along the creek and beyond. A demonstration site at the upper reaches of the creek could serve to illustrate and educate the local landowners on the impacts of these invasive species and the potential for their control. After demonstrating success and establishing partnerships in the upper creek, ISP could extend control work down the length of the creek and to adjacent marshes. Control work in the mid and lower reaches of the Creek (where California clapper rail have been identified) could demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP.

## 3. Blackie's Pasture, Marin County

**Landowner:** City of Tiburon? Marin County Open Space?

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** 0.1 acre

**Cordgrass species:** *S. densiflora* and *S. alterniflora*/hybrids

**Possible project partners:** City of Tiburon, Marin County Open Space

**Endangered species and other site issues:** California clapper rails are *not* known to be present at this site.

**Control Work/details:** This is a relative small confined site. A combination of control techniques such as digging, mowing, covering and herbicides would be used depending on the extent and size of the individual *S. densiflora* and *S. alterniflora*/hybrid clones. Depending on identification of partners, the Control Program might also include the other discrete clones in the Richardson Bay area such as Strawberry Point and Seminary Cove.

**Reason for selection as a possible demonstration site:** Blackie's Pasture is one the most northerly population of *S. alterniflora*/hybrids in Marin County. This site is relatively small and contained with a single landowner. Control at this location could illustrate control efficacy, as well reduce the potential dispersal of non-native propagules further into Marin's Richardson Bay marshes, into the North Bay and beyond the Golden Gate to the outer coast. Blackie's Pasture is also a highly visited site, with ample public access, providing a good opportunity for public education.

#### 4. India Basin, San Francisco County

**Landowner:** Port of San Francisco?

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** 0.1 acre

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** Port of San Francisco; San Francisco Public Utilities Commission; San Francisco Parks and Recreation Department; League for Environmental Justice

**Endangered species and other site issues:** Unknown – surveys for California clapper rail would be conducted as part of the site-specific plan. Control work in areas found to be occupied by clapper rails could occur only as authorized by the USFWS.

**Control Work/details:** This is a relative small confined site. A combination of control techniques such as digging, mowing, covering and herbicides could be used, depending on the extent and size of the *S. alterniflora*/hybrid clones at the time of treatment.

**Reason for selection as a possible demonstration site:** India Basin is one the most northerly population of *S. alterniflora*/hybrids on the west side of the Bay. This site is relatively small and may have a single owner, thus simplifying planning and coordination. Rapidly implemented treatment at this location could demonstrate control efficacy and help reduce the spread of *S. alterniflora*/hybrids north along the Bay shore to Crissy Field, and beyond the Golden Gate to the outer coast.

If landowners and partners could be identified, we might also include other discrete clones in the area, such as Candlestick Cove.

## 5. Colma Creek, San Mateo County

**Landowner:** City of San Mateo?

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** Approximately 7.5 of greater than 50 total infested acres

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** City of San Mateo, San Mateo Weed Management Team

**Endangered species and other site issues:** California clapper rails are present on the mudflats, however they have not been reported along the mid and upper reaches of the Creek.

**Control Work/details:** This area is densely covered by *S. alterniflora*/hybrid meadows, which have spread along the creek banks and onto adjacent mudflats. Control would be initiated at the upstream edge of the invasion, and work progressively down to the mudflats. Techniques to reduce seed set would be implemented in areas that cannot be fully treated the first year. This would be a suitable site to test a range of manual, physical, and chemical eradication and seed-set reduction techniques.

**Reason for selection as a possible demonstration site:** *S. alterniflora*/hybrids were introduced to Colma Creek (or San Bruno Slough) as transplants from the original introduction site in Hayward, Alameda County. In the 25 years since their introduction at this site, *S. alterniflora* /hybrids have spread down the creek and to the adjacent mudflats, forming very dense meadows. This is one of the densest and most northerly populations on the west side of the Bay. This site serves as a ready source for *S. alterniflora* propagules, which are dispersed further north in the Bay (and potentially beyond the Golden Gate to outer coast marshes).

Because of the density of the population, this would be a suitable site to test a range of manual, physical, and chemical eradication and seed-set reduction techniques. Apart from testing and demonstrating control methods, pilot work at this site would help to slow the spread of *S. alterniflora*/hybrids northward. Control work in clapper rail habitat would demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP.

## 6. Bayfront Park, San Mateo County

**Landowner:** City of San Mateo?

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** 0.65 acre

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** San Mateo Mosquito Abatement District, San Mateo County Weed Management Area

**Endangered species and other site issues:** California clapper rails are *not* present at this site.

**Control Work/details:** The project would focus on control of discrete clones and meadows along the mudflats. The project would demonstrate either a mechanical method of control, or mowing with secondary herbicide application. The site is adjacent to a bike path which may provide access.

**Reason for selection as a possible demonstration site:** ISP surveys in 2001 found discrete *S. alterniflora*/hybrid clones developing into clusters and small meadows along the length of Bayfront Park, with extensive mudflats adjacent to the Park that are as yet uninvaded. Bayfront Park is located in the midst of several invaded sites, and the mudflats are highly susceptible to further invasion. Demonstration work at this site could help slow or prevent the continued invasion of the mud flats.

Because this site currently has no California clapper rail, control work could begin in early summer, when there are many low tide days for treatment. Early treatment will also allow for multiple treatment days if required. If this site is left without control, the *S. alterniflora*/hybrid population will spread further out onto the adjacent mudflats.

This project would also provide the opportunity to form valuable partnerships. The San Mateo Mosquito Abatement District has already been working with the San Mateo Weed Management Area and the Don Edwards National Wildlife Refuge to control *Spartina* in the County. As a partner, the Mosquito Abatement District could provide experience, crews, boats, and equipment.

## 7. Outer Bair Island, San Mateo County

**Landowner:** Don Edwards National Wildlife Refuge (DENWR), USFWS

**Contact:** Joy Albertson, DENWR

**Site location:** See attached map.

**Acreage to be treated:** 0.36 acre or 28 acres, depending on project definition.

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** USFWS, Don Edwards Wildlife Refuge

**Endangered species and other site issues:** California clapper rail has been reported at this location, therefore control in this area would occur only as authorized by USFWS, and would likely have to take place outside the bird's breeding/nesting season.

**Control Work/details:** Chemical control would be recommend at this location. The populations of *S. alterniflora*/hybrids are quite dense, and boats would be required to access this site and deliver equipment and chemicals. San Mateo Mosquito Abatement District has already been contracted to control the spread of *Spartina* in this area and is thus familiar with the site. All the equipment, including airboats, herbicide applicators, etc. is available. ISP may be able to provide funds for items such as herbicide and labor.

**Reason for selection as a possible demonstration site:** Bair Island is becoming increasingly infested with *S. alterniflora*/hybrids. This outer area of Bair is highly invaded and is providing numerous propagules for further invasion of the neighboring marshes. Full eradication of this site may be a challenge to achieve given the density of the invasion and difficult access to the site. However, cover and seed set of non-native *Spartina* can be reduced.

## 8. Westpoint and Ravenswood Sloughs, San Mateo County

**Landowner:** Don Edwards National Wildlife Refuge (DENWR), USFWS

**Contact:** Joy Albertson, DENWR

**Site location:** See attached map.

**Acreage to be treated:** Approximately 5 acres

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** USFWS, DENWR; San Mateo Mosquito Abatement District; San Mateo Weed Management Team.

**Endangered species and other site issues:** California clapper rail has been reported at this location, therefore control in this area would occur only as authorized by USFWS, and would likely have to take place outside the bird's breeding/nesting season.

**Control Work/details:** This location is well suited for demonstration of herbicide control and various seed set reduction methods. The populations of *S. alterniflora*/hybrids are quite dense. USFWS has contracted San Mateo Mosquito Abatement District to control the spread of *S. alterniflora* in this area. All the equipment, including airboats, herbicide applicators, etc. is available. ISP would provide funds for items such as herbicide and labor, and assistance in planning and coordination, as needed. The site may be selected by USDA-ARS researches working for the ISP to examine the efficacy of other herbicide treatments such as fluridone or imazapyr.

**Reason for selection as a possible demonstration site:** At the mouth of Ravenswood and Westpoint Sloughs are the densest, most southerly populations of *S. alterniflora*/hybrids on the west side of the Bay. The USFWS Don Edwards National Wildlife Refuge manages this property, and has been trying to control *S. alterniflora*/hybrids. Control at these sites would reduce spread of propagules, seed, and pollen further into the South Bay. Additionally, channels and sloughs in the area are becoming invaded *S. alterniflora*/hybrids and are filling in with plants and sediment. Successful work at these locations could demonstrate restoration of channels and channel habitat, and help prevent flood control problems. Control work in these areas could demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP.

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## 9. Alviso Slough – Coyote Creek, Santa Clara and Alameda Counties

**Landowner:** Santa Clara County, Santa Clara Valley Water District (SCVWD) Don Edwards National Wildlife Refuge (DENWR), USFWS

**Contact:** Lisa Porcella & Gale Rankin, SCVWD; Joy Albertson, DENWR

**Site location:** See attached map.

**Acreage to be treated:** Less than 0.5 acre

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** SCVWD, DENWR, USFWS, Santa Clara County Weed Management Team

**Endangered species and other site issues:** California clapper rail has been reported at this location, therefore control in this area would occur only as authorized by USFWS, and would likely have to take place outside the bird's breeding/nesting season.

**Control Work/details:** Spot control by a combination of digging, mowing, covering and herbicide depending on the extent and size of the *Spartina* clones.

**Reason for selection as a possible demonstration site:** Alviso Slough and Coyote Creek are properties managed by both the Santa Clara Valley Water District the Don Edward National Wildlife Refuge. ISP surveys in 2001 identified discrete clones along the fringe marsh of Alviso Slough and Coyote Creek, however more detailed mapping is still required. This is one of the most southerly populations of *S. alterniflora*/hybrids on the East Bay. Control at this site could contain the population and reduce the overall distribution. California clapper rails are present in the adjacent marshes, but given limited amounts of non-native cordgrass, control could take place with a minimal impact to the clapper rail population. Control work in clapper rail habitat would demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP. If this site were left without control, the *S. alterniflora*/hybrid population would likely continue to spread, and thus present more of a challenge to control, particularly in the presence of the California clapper rail.

## 10. Mowry Slough, Santa Clara and Alameda Counties

**Landowner:** Don Edwards National Wildlife Refuge (DENWR), USFWS

**Contact:** Joy Albertson, DENWR

**Site location:** See attached map.

**Acreage to be treated:** Approximately 0.5 acre

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** DENWR, USFWS, Santa Clara Valley Water District

**Endangered species and other site issues:** California clapper rail has been reported at this location, therefore control in this area would occur only as authorized by USFWS, and would likely have to take place outside the bird's breeding/nesting season.

**Control Work/details:** Spot control by a combination of digging, mowing, covering and herbicide depending on the extent and size of the *Spartina* clones.

**Reason for selection as a possible demonstration site:** Mowry Slough is part of the Don Edward National Wildlife Refuge. ISP surveys in 2001 identified discrete clones along the fringe marsh south of Mowry Slough. This is one of the most southerly populations of *S. alterniflora*/hybrids on the East Bay. Control at this site could contain the population and reduce the overall distribution. California clapper rails are present in the adjacent marshes, but given limited amounts of non-native cordgrass, control could take place with a minimal impact to the clapper rail population. Control work in clapper rail habitat would demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP. If this site were left without control, the *S. alterniflora*/hybrid population would likely continue to spread, and thus present more of a challenge to control, particularly in the presence of the California clapper rail.

## 11. Alameda Flood Control Channel/Upper Coyote Hills Slough, Alameda County

**Landowner:** Alameda Flood Control District, Don Edwards National Wildlife Refuge (DENWR)

**Contact:** Saul Ferdan (AMPA), Joy Albertson (USFWS, DENWR)

**Site location:** See attached map.

**Acreage to be treated:** Approximately 14 acres

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** DENWR, USFWS, Santa Clara Valley Water District

**Endangered species and other site issues:** California clapper rail are *not* present in the upper reaches of the channel, but are present in the lower reaches and at the channel mouth. Control work in these areas would occur only as authorized by the USFWS, and would likely have to occur outside of the bird's breeding/nesting season.

**Control Work/details:** Dredging technique from levy edge, or mowing with additional chemical control with glyphosate. In order to control the dense stand of *Spartina* that line the slough multiple treatments may be required. The upper, eastern reach of the slough would be a good demonstration site given that no California clapper rail are found in this area. Control could possibly begin in the early summer, which would allow for multiple treatments.

**Reason for selection as a possible demonstration site:** The Alameda Creek Flood Control Channel (a.k.a. Coyote Hills Slough) is managed by the Alameda County Flood Control District primarily for flood control. The original site of *S. alterniflora* introduction in the San Francisco Estuary was a restored salt pond near the mouth of the Channel. ISP surveys in 2001 identified dense stands of *S. alterniflora* along the length of the Channel, as far as five miles upstream from the Bay. The Flood Control District has been doing work to control *S. alterniflora* in the Channel for a number of years, and would

likely be receptive to ISP support and partnership. Given the potential for non-native *Spartina* to invade and obstruct flood control channels, it is imperative that the ISP help develop effective control methods. The Flood Control District has also been collaborating with the Alameda Mosquito Abatement District and the Don Edward Wildlife Refuge, sharing boats and working on their adjoining properties. As a partner, the District could provide, crews, experience, and equipment.

Because California clapper rails are not found in the upper/eastern reach of the channel, control in this area might be permitted to begin in early summer, allowing multiple treatments, if necessary. Control work in clapper rail habitat would demonstrate implementation of clapper rail best management practices (BMPs) developed by the ISP. Control work in areas occupied by California clapper rails could occur only as authorized by the USFWS.

## 12. Whales Tail/Alameda Creek, Alameda County

**Landowner:** California Department of Fish and Game, City of San Leandro Mitigation Site, USFWS?

**Contact:** John Krause, CDFG; Norm Ploss, Special Assistant - City of Fremont

**Site location:** See attached map.

**Acreage to be treated:** ? of 50 acres total

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** CDFG, Norm Ploss/ City of San Leandro, EBRPD? DENWR, USFWS?

**Endangered species and other site issues:** California clapper rail has been reported at this location, therefore control in this area would occur only as authorized by USFWS, and would likely have to take place outside the bird's breeding/nesting season.

**Control Work/details:** Given the adjacent restoration sites that are at risk, it is recommended that the non-native *Spartina* in the area be controlled. A combination of mowing and chemical control would be recommended for this site. Repeat treatments through the season would most likely be required. Perhaps a novel method of mechanical control could be tested in the areas of dense meadows. If site eradication is not feasible, ISP would recommend that seed set be reduced, either by mechanical means, mowing in the early summer season (July-August) so as not to release floating stems with fertile seed on the tide, or by chemical means, by spraying glyphosate. Permits would be required for early control work in this CLRA habitat.

**Reason for selection as a possible demonstration site:** This recently restored site has numerous large *S. alterniflora*/hybrid clones developing into dense meadows, especially at the bay front of the marsh. This marsh is becoming increasingly infested with non-native *Spartina* and is providing a large seed source which is dispersing on the tides to other neighboring marshes. Of particular concern is the adjacent property at Eden landing which is being open to tidal flow for restoration. Without control, this new restoration site will likely become infested by seed from the Whales Tail/Alameda Creek area.

### 13. Oro Loma Marsh, Alameda County

**Landowner:** East Bay Regional Park District (EBRPD)

**Contact:** Nancy Brownfield, Joe Didonato, Mark Taylor

**Site location:** See attached map.

**Acreage to be treated:** Multiple locations throughout 27 acres

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** EBRPD

**Endangered species and other site issues:** California clapper rails are *not* present at this site.

**Control Work/details:** This recently restored site has numerous large *S. alterniflora*/hybrid clones developing throughout the marsh. Access to the clones is said to be quite labor intensive. EBRPD has recently acquired a vehicle that is specially designed for driving through marsh and mud flats. This machine may be used to smother clones, or access clones for herbicide treatment. This might also be a suitable site to demonstrate diking/drowning techniques.

**Reason for selection as a possible demonstration site:** Oro Loma Marsh is part of East Bay Regional Park District. The site was open to tidal action for restoration and has since become invaded by numerous *Spartina* clones. Neighboring invaded marshes, such as Cogswell Marsh, were probably the source of the non-native propagules. This site should be treated immediately before the infestation is any greater. California clapper rails are not yet present in this marsh, but they are present in adjacent marshes and will likely inhabit Oro Loma as more vegetation becomes established. Given that no California clapper rails are currently present, early summer control may be feasible. If this site is left without control and California clapper rails establish, there will be an even greater challenge to control. As a partner, the EBRPD brings considerable experience, in addition to crews and equipment. This project would provide EBRPD much-needed support, and build on the existing good working relationship between EBRPD and ISP.

### 14. San Lorenzo Creek Mouth/Roberts Landing, Alameda County

**Landowner:** City of San Leandro, State Lands?

**Contact:** Undetermined. Mark Taylor (EBRPD) could help determine actual landowner.

**Site location:** See attached map.

**Acreage to be treated:** Approximately 10 acres

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** City of San Leandro, EBRPD, State Lands, ESA, LSA

**Endangered species and other site issues:** There are California clapper rails in adjacent marshes, and it is likely that rails use this site for foraging. A survey would be conducted

as part of the site-specific plan, and control work in areas occupied by California clapper rails could occur only as authorized by the USFWS.

**Control Work/details:** The mouth of San Lorenzo Creek has a very, very dense population of *S. alterniflora*/hybrids. Individual clones are coalescing on the mudflats and developing into a meadow. Based on preliminary reconnaissance, it appears that the sediment in this area could probably support the weight of heavy equipment. If this is the case, this would be an excellent to test the efficacy of smothering by tractors to kill and/or reduce the overall biomass of the non-native cordgrass, with herbicide application as a secondary treatment. EBRPD may be able to provide staff and equipment for this location. The site, or a site near here, may be selected by USDA-ARS researches working for the ISP to examine the efficacy of alternative treatment methods.

**Reason for selection as a possible demonstration site:** The Robert's Landing area, including the San Lorenzo Creek, creek mouth, and interior marshes (including Bunker Marsh, Citation Marsh, North Marsh, East Marsh and San Lorenzo Marsh) are becoming increasingly invaded by *S. alterniflora*/hybrids. Every year, the invasion is increasing "exponentially" (D. Ayres pers. comm.). The creek mouth is particularly infested, with dense meadows establishing. Interior (secondary and tertiary) creeks and channels are becoming increasingly invaded and are filling in with sediment. The loss of such channels is altering the native hydrology of the marsh, and may also lead to future flooding problems. Seed and propagules are spread further into the marshes with the incoming tides, while propagules are becoming dispersed beyond this site with the out-going tides and currents. Just south of this location is a newly restored marsh, Oro Loma. It is becoming increasingly more infested, with the San Lorenzo Creek mouth and marsh being the most likely source of non-native seed as it is its neighbor. Just north of the creek mouth is a narrow band of rare sandy beach habitat that has been proposed for the location of a recovery project for the endangered California sea blite, *Pseuda californica*. This recovery effort will be in vain if *Spartina* is not controlled in the area as its invasion is altering the beach forming processes. A demonstration of *Spartina* control at this location would have many benefits, including reducing bay wide spread, invasion of neighboring restored marshes, clearing channels and restoring rare beach habitat along the bay front. This demonstration site could also help illustrate the efficacy of smothering by tracked vehicles as a means of control of dense *Spartina* meadows.

## 15. Emeryville Crescent, Alameda County

**Landowner:** East Shore State Park/ East Bay Regional Park District (EBRPD)

**Contact:** Nancy Brownfield, Joe Didonato, EBRPD and Jim Hanson, CalTrans

**Site location:** See attached map.

**Acreage to be treated:** 0.25 acre

**Cordgrass species:** *S. alterniflora*/hybrids

**Possible project partners:** EBRPD, East Shore State Parks, California Department of Transportation (CalTrans), adjacent creek groups? Berkeley Marina?

**Endangered species and other site issues:** California clapper rails are present in low densities in this area. Control of the discrete clones may be able to minimize impact to the rails. Control work in these areas could occur only as authorized by the USFWS, and California clapper rail surveys would likely be required before, during and after control.

**Control Work/details:** This marsh has a number of discrete *S. alterniflora*/hybrid clones dispersed along the bay edge. Spot control of the discrete clones would be recommended. However, hybrids that appear like natives will continue to be hidden in the native marsh. Thus, repeated visits will be required for more visual surveys and genetic transects to confirm that the cordgrass in the area is native. A much more conservative approach (to conserving the genetic integrity of this site) would be to control the entire area.

**Reason for selection as a possible demonstration site:** This site is one of the most northerly populations of *S. alterniflora*/hybrids on the east side of the Bay. *Spartina* control at this location would be relatively feasible given the discrete clones scattered throughout the marsh. Control at this site would also reduce the overall distribution on non-native *Spartina* through out the Bay, and reduce the number of dispersing propagules further into the North Bay or beyond the Golden Gate to the outer coast marshes. Cal-Trans has begun some initial control work in some areas, and has expressed an interest in collaborating with the ISP to expand efforts.

## 16. Point Pinole Marshes, Contra Costa County

**Landowner:** East Bay Regional Parks District (EBRPD)

**Contact:** Nancy Brownfield, Joe Didonato

**Site location:** See attached map.

**Acreage to be treated:** 0.01 acre

**Cordgrass species:** *S. alterniflora*/hybrids and *S. densiflora*.

**Possible project partners:** EBRPD

**Endangered species and other site issues:** California clapper rails are scattered but present in adjacent marshes. Surveys would need to be performed as a part of the site-specific plan, and control in areas found to have clapper rails could only be conducted as authorized by the USFWS.

**Control Work/details:** Spot control with a combination of digging, mowing, covering and herbicides depending on the extent and size of the *S. alterniflora*/hybrid and *S. densiflora* clones at the time of treatment.

**Reason for selection as a possible demonstration site:** Point Pinole is the location of the most northerly population of *S. alterniflora*/hybrids and *S. densiflora* on the east side of the San Francisco Bay. A minimal number of *S. alterniflora*/hybrid clones have been found at this site. More numerous *S. densiflora* clones have been found scattered throughout Pt. Pinole, in particular Whittel Marsh. EBRPD has done quite a bit of *S. densiflora* control at this site in the past. However, follow up *S. densiflora* control needs to take place. Control at this location would reduce the *S. alterniflora*/hybrid distribution in

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the East Bay, confining it to the Central and South Bays. Control of both species at this site would help protect the North Bay, Suisun, and the outer coast from further invasion.

## 17. Southampton Marsh, Contra Costa County

**Landowner:** Benecia State Park

**Contact:** Undetermined

**Site location:** See attached map.

**Acreage to be treated:** 0.58 acre

**Cordgrass species:** *S. patens*

**Possible project partners:** Benecia State Park, CNPS?

**Endangered species and other site issues:** *S. patens* is growing adjacent to the endangered plant *Cordylanthus mollis* spp. *Mollis* (soft birds beak). Also, a survey will need to be conducted to determine whether salt marsh harvest mice are present.

**Control Work/details:** The demonstration project could begin with the discrete patch of *S. patens* in the northeast corner of the marsh, and implement one or both of two treatment methods. For the first method, adjacent soft birds beak would be temporarily covered with geo-textile fabric, and herbicide would be applied to the patch of *S. patens*. Alternatively, the patch of *S. patens* could be treated by covering with geotextile fabric, leaving the soft birds beak undisturbed. The second method would likely require follow-up herbicide treatment of surviving *S. patens* plants. Once a suitable means of protecting soft birds beak was developed, the project could be extended to include the remainder of the *S. patens* population.

**Reason for selection as a possible demonstration site:** *S. patens* is found growing in discrete patches at this site, and this is the only known location of the species in the San Francisco Estuary. Thus, control at this location could lead to the successful eradication of this species in the Estuary. Control of *S. patens* is particularly important because of the threat it poses to the rare and endangered marsh plant, *Cordylanthus mollis* spp. *mollis*, soft birds beak.



Figure I-1. Possible *Spartina* Control Program First Year Pilot and Demonstration Projects

Table I-1. Possible 2003 Spartina Control Demonstration Sites - Site Selection Criteria With Sites Ranked by Highest Total Score

Weighted Priority #	Map #	Site Name	Outlier population	CLRA absent	CLRA habitat at risk (early invasion)	Small/discrete population	Adjacent mudflats at risk	Invaded channel/Creek at risk	Flood control channel at risk	Landowner partnerships (#)	Landowner partners	Public visibility/outreach	Restoration site (weighted x 2)	Adjacent to existing restoration site at risk (weighted x 2)	Adjacent to soon to be open restoration site
1	14	San Lorenzo Creek Mouth/Robert's Landing	0	0	0	0	1	1	1	5	City of San Leandro, EBRPD, State Lands, ESA, LSA	1	0	2	0
2	7	Outer Bair Island	0	0	0	0	1	1	0	3	USFWS, DENWR; San Mateo Mosquito Abatement District, San Mateo County Weed Management Area	1	2	2	1
3	2	Corte Madera Creek	1	0	0	0	1	1	1	5	Marin County Parks and Recreation Department, Friends of Corte Madera Creek, Marin Rowing Association, Marin County Open Space, City of Larkspur/Corte Madera	1	0	2	0
4	11	Alameda Flood Control Channel/Coyote Hills Slough	0	1	0	0	1	1	1	2	DENWR, USFWS, Santa Clara Valley Water District	1	0	2	1
5	12	Whales Tail/Alameda Creek	0	0	0	0	1	1	0	3	California Department of Fish and Game, City of San Leandro, USFWS, ....	0	2	2	1
6	13	Oro Loma Marsh	0	1	0	0	1	0	0	1	EBRPD	1	2	2	0
7	4	India Basin	1	1	0	1	1	1	0	4	Port of San Francisco; San Francisco Public Utilities Commission; San Francisco Parks and Recreation Department; League for Environmental Justice	1	0	0	0
8	3	Blackie's Pasture	1	1	0	1	1	1	0	3	City of Tiburon, Marin County Open Space, Marin Audubon...	1	0	0	0

Table I-1. Possible 2003 Spartina Control Demonstration Sites - Site Selection Criteria With Sites Ranked by Highest Total Score

Site Name	Experimental control method	control method	County	Species	Approx. Acreage	Relative size of invasion (1=<1 acre, 2=1-5 acres, 3=5-15 acres, 4=15-50 acres, 5=>50 acres)	Species eradication feasibility	Site eradication feasibility	SUM
San Lorenzo Creek Mouth/Robert's Landing	1	The mouth of San Lorenzo Creek has a very, very dense population of <i>S. alterniflora</i> hybrids. Individual clones are coalescing on the mudflats and developing into a meadow. Based on preliminary reconnaissance, it appears that the sediment in this area could probably support the weight of heavy equipment. If this is the case, this would be an excellent test to the efficacy of smothering by tractors to kill and/or reduce the overall biomass of the non-native cordgrass, with herbicide application as a secondary treatment. EBRPD may be able to provide staff and equipment for this location.	Alameda County	<i>S. alterniflora</i> / hybrids	10 of 27 total	3	0	1	16
Outer Bair Island	0	Chemical control would be recommend at this location. The populations of <i>S. alterniflora</i> hybrids are quite dense, and boats would be required to access this site and deliver equipment and chemicals. San Mateo Mosquito Abatement District has already been contracted to control the spread of <i>Spartina</i> in this area and is thus familiar with the site. All the equipment, including airboats, herbicide applicators, etc. is available. ISP may be able to provide funds for items such as herbicide and labor.	San Mateo County	<i>S. alterniflora</i> / hybrids	5-28 of 55 total	5	0	0	16
Corte Madera Creek	0	Portions of the site would be suited for a variety of physical and mechanical control such as digging and hand pulling, and other areas would be most effectively and efficiently treated with herbicides. Demonstration work could begin with physical and mechanical control at the Bay front and the upstream reach of the infestation.	Marin County	<i>S. densiflora</i>	1 of 13 total	3	0	0	15
Alameda Flood Control Channel/Coyote Hills Slough	1	Dredging technique from levy edge, or mowing with additional chemical control with glyphosate. In order to control the dense stand of <i>Spartina</i> that line the slough multiple treatments may be required. The upper, eastern reach of the slough would be a good demonstration site given that no California clapper rail are found in this area. Control could possibly begin in the early summer, which would allow for multiple treatments. The site may be used by researchers from USDA-ARS to examine the efficacy of other herbicide treatments such as fluridone or imazapyr.	Alameda County	<i>S. alterniflora</i> / hybrids	14 of 48 total	4	0	0	15
Whales Tail/Alameda Creek	0	This recently restored site has numerous large <i>S. alterniflora</i> / hybrid clones developing into dense meadows, especially at the bay front of the marsh. This site is adjacent to an area at Eden Landing that is being open to tidal flow for restoration. This site will likely become infested by seed from the Whales Tail/Alameda Creek area. It is recommended that the non-native <i>Spartina</i> in the area be controlled if possible, and if not at least seed set be reduced either by mechanical means, mowing in the early summer season (July-August) so as not to release floating stems with fertile seed on the tide, or by chemical means, spraying glyphosate. However, permits would be required for early control work in this CLRA habitat. Ideally a combination of the two methods would be used to control the spread of the plant, not just the seed.	Alameda County	<i>S. alterniflora</i> / hybrids	? of 50 total	4	0	0	14
Oro Loma Marsh	1	This recently restored site has numerous large <i>S. alterniflora</i> / hybrid clones developing throughout the marsh. Access to the clones is said to be quite labor intensive. EBRPD has recently acquired a vehicle that is specially designed for driving through marsh and mud flats. This machine may be used to smother clones, or access clones for herbicide treatment. This might also be a suitable site to demonstrate diking/drowning techniques.	Alameda County	<i>S. alterniflora</i> / hybrids	? of 27 total	4	0	1	14
India Basin	0	This is a relative small confined site. A combination of control techniques such as digging, mowing, covering and herbicides could be used, depending on the extent and size of the <i>S. alterniflora</i> / hybrid clones at the time of treatment.	San Francisco County	<i>S. alterniflora</i> / hybrids	0.1 total (0.76 So.SF total)	1	0	1	12
Blackie's Pasture	0	This is a relative small confined site. A combination of control techniques such as digging, mowing, covering and herbicides would be used depending on the extent and size of the individual <i>S. densiflora</i> and <i>S. alterniflora</i> / hybrid clones. Depending on identification of partners, the Control Program might also include the other discrete clones in the Richardson Bay area such as Strawberry Point and Seminary Cove.	Marin County	<i>S. densiflora</i> and <i>S. alterniflora</i> / hybrids	0.1 total	1	0	1	11

Table I-1. Possible 2003 Spartina Control Demonstration Sites - Site Selection Criteria With Sites Ranked by Highest Total Score

Weighted Priority #	Map #	Site Name	Outlier population	CLRA absent	CLRA habitat at risk (early invasion)	Small/discrete population	Adjacent mudflats at risk	Invaded channel/Creek at risk	Flood control channel at risk	Landowner partnerships (#)	Landowner partners	Public visibility/outreach	Restoration site (weighted x 2)	Adjacent to existing restoration site at risk (weighted x 2)	Adjacent to soon to be open restoration site
9	15	Emeryville Crescent	1	0	1	1	1	0	0	5	EBRPD, East Shore State Parks, California Department of Transportation (CalTrans), adjacent creek groups? Berkeley Marina?	0	0	0	0
10	1	Pickleweed Park	1	0	1	1	1	1	1	2	City of San Rafael, Marin County Weed Management Area	0	0	0	0
11	5	Colma Creek	0	1	0	0	1	1	0	2	City of San Mateo, San Mateo Weed Management Team	0	0	0	0
12	9	Alviso Slough - Coyote Creek	1	0	1	1	1	1	0	3	USFWS, DENWR; SCVWD; Santa Clara County Weed Management Team	0	0	0	0
13	10	Mowry Slough	1	0	0	1	1	0	0	3	USFWS, DENWR; San Mateo Mosquito Abatement District; San Mateo Weed Management Team	0	0	0	1
14	17	Southampton Marsh	1	0	1	1	0	0	0	2	Benecia State Park, CNPS?	0	0	0	0
15	8	West Point & Ravenswood Slough	0	0	0	0	1	1	0	3	USFWS, DENWR; San Mateo Mosquito Abatement District; San Mateo Weed Management Team	0	0	0	0
16	16	Point Pinole	1	0	1	1	1	0	0	1	EBRPD	1	0	0	0
17	6	Bayfont Park	0	1	0	0	1	0	0	2	San Mateo Mosquito Abatement District, San Mateo County Weed Management Area	1	0	0	0

Table I-1. Possible 2003 Spartina Control Demonstration Sites - Site Selection Criteria With Sites Ranked by Highest Total Score

Site Name	Experimental control method	control method	County	Species	Approx. Acreage	Relative size of invasion (1=<1 acre, 2=1-5 acres, 3=5-15 acres, 4=15-50 acres, 5=>50 acres)	Species eradication feasibility	Site eradication feasibility	SUM
Emeryville Crescent	0	This marsh has a number of discrete <i>S. alterniflora</i> /hybrid clones dispersed along the bay edge. Spot control of the discrete clones would be recommended. However, hybrids that appear like natives will continue to be hidden in the native marsh. Thus, repeated visits will be required for more visual surveys and genetic transects to confirm that the cordgrass in the area is native. A much more conservative approach (to conserving the genetic integrity of this site) would be to control the entire area.	Alameda County	<i>S. alterniflora</i> /hybrids	0.25 total	1	0	1	11
Pickleweed Park	0	<i>S. densiflora</i> control at this site may include a combination of digging, mowing, covering and herbicide depending on landowner and community opinion. USDA-ARS researchers working with the ISP may propose work at this location to examine efficacy of new <i>S. densiflora</i> control methods, including alternative herbicides (such as fluridone and imazapyr) and application of herbicide to cut plant stumps.	Marin County	<i>S. densiflora</i>	0.5 total	1	0	1	10
Colma Creek	1	This area is densely covered by <i>S. alterniflora</i> /hybrid meadows, which have spread along the creek banks and onto adjacent mudflats. Control would be initiated at the upstream edge of the invasion, and work progressively down to the mudflats. Techniques to reduce seed set would be implemented in areas that cannot be fully treated the first year. This would be a suitable site to test a range of manual, physical, and chemical eradication and seed-set reduction techniques.	San Mateo County	<i>S. alterniflora</i> / hybrids	7.5 of 50 total	4	0	0	10
Alviso Slough - Coyote Creek	0	Spot control by a combination of digging, mowing, covering and herbicide depending on the extent and size of the Spartina clones.	Santa Clara and Alameda Counties	<i>S. alterniflora</i> / hybrids	< 0.5 acres total	1	0	1	10
Mowry Slough	0	Spot control by a combination of digging, mowing, covering and herbicide depending on the extent and size of the Spartina clones.	Santa Clara and Alameda Counties	<i>S. alterniflora</i> / hybrids	0.5 total	1	0	1	9
Southampton Marsh	1	The demonstration project could begin with the discrete patch of <i>S. patens</i> in the northeast corner of the marsh, and implement one or both of two treatment methods. For the first method, adjacent soft birds beak would be temporarily covered with geo-textile fabric, and herbicide would be applied to the patch of <i>S. patens</i> . Alternatively, the patch of <i>S. patens</i> could be treated by covering with geotextile fabric, leaving the soft birds beak undisturbed. The second method would likely require follow-up herbicide treatment of surviving <i>S. patens</i> plants. Once a suitable means of protecting soft birds beak was developed, the project could be extended to include the remainder of the <i>S. patens</i> population.	Contra Costa County	<i>S. patens</i>	0.58 total	1	1	1	9
West Point & Ravenswood Slough	0	This location is well suited for demonstration of herbicide control and various seed set reduction methods. The populations of <i>S. alterniflora</i> /hybrids are quite dense. USFWS has contracted San Mateo Mosquito Abatement District to control the spread of <i>S. alterniflora</i> in this area. All the equipment, including airboats, herbicide applicators, etc. is available. ISP would provide funds for items such as herbicide and labor, and assistance in planning and coordination, as needed.	San Mateo County	<i>S. alterniflora</i> / hybrids	5 of 13 total	3	0	0	8
Point Pinole	0	Spot control with a combination of digging, mowing, covering and herbicides depending on the extent and size of the <i>S. alterniflora</i> /hybrid and <i>S. densiflora</i> clones at the time of treatment.	Contra Costa County	<i>S. alterniflora</i> / hybrids and <i>S. densiflora</i>	0.01 total	1	0	1	8
Bayfont Park	0	The project would focus on control of discrete clones and meadows along the mudflats. The project would demonstrate either a mechanical method of control, or mowing with secondary herbicide application. The site is adjacent to a bike path which may provide access	San Mateo County	<i>S. alterniflora</i> / hybrids	0.65 total	1	0	0	6