San Francisco Estuary
INVASIVE SPARTINA 2004 SURVEY
Distribution of Invasive Spartina Populations by Species
S. alterniflora / hybrid Lab Tested*
Diameter range in meters
0 - 4.5
4.5 - 9.5
10 - 65
*S. alterniflora / hybrid verified by lab tests.
S. alterniflora / hybrid Field ID
Diameter range in meters
0 - 4.5
5 - 9.5
10 - 100
Width of line in meters
Seedling to 1m
1m-3m
3m-10m
10m-30m
30m+
Percent cover
1-10%
10-30%
30-60%
60-90%
90-100%
S. densiflora
Diameter range in meters
0.01 - 1.75
2 - 20
Width of line in meters
Seedling to 1m
Percent cover
1-10%
10-30%
30-60%
60-90%
Shoreline Not Surveyed
S. patens
Diameter range in meters
0.5 - 4
5 - 19
S. anglica
Diameter range in meters
0.05 - 5
6 - 11
Points represent individual Spartina clones or small clusters of clones.
Lines represent continous linear patches of plants.
Areas represent areal patches of plants characterized by varying percentage of cover.
Source: Invasive Spartina Project, 2004 California Coastal Conservancy
Photos: Invasive Spartina Project, except where noted.
North Bay
Suisun Bay
Central Bay
South Bay
Large stands of native Spartina foliosa are still flourishing in the North Bay.
No Hybrids Found
Spot surveys and transect sampling were conducted in the North Bay, West San Pablo Bay and the Napa-Sonoma Marsh. No S. alterniflora/hybrids have been found in this area to date. The single S. densiflora plant found in Pond 2A in 2001 off China Slough has since been eradicated.
S. patens Introduction
Southampton Marsh: Population has spread widely within marsh since initial report, and is competing with the rare Cordylanthus mollis sp. mollis. The 2004 S. patens population estimate was 0.57 acres.
The population of S. patens continues to spread at Benicia's Southampton Marsh, invading the habitat of the rare Cordylanthus mollis sp. mollis.
The northern most population of S. densiflora is Brickyard Cove in Marin. In 2004 the cover of S. densiflora at Pickleweed Park, located at the mouth of the San Rafael Canal, was estimated to be 0.12 acre. However, the majority of the S. densiflora population continues to be at Corte Madera Creek.
Outlier Populations
Marin County is host to 3 out of 4 invasive Spartina species, including the only known population of S. anglica. S. anglica has still not been found spreading beyond Creekside Park.
S. densiflora & S. anglica Introduction
Creekside Park: Site of initial introduction of Spartina densiflora and S. anglica. Plants were transplanted to site in 1976 as part of marsh restoration project. S. densiflora escaped Creekside Park, and has spread along entire length of Corte Madera Creek, and across the Bay the Pt. Pinole Regional Shoreline and south to Sanchez Marsh in the Burlingame Lagoon.
S. alterniflora hybrid Northern Limit
The northern limits of the S. alterniflora-hybrids continues to be Pt. Pinole in Contra Costa county and San Rafael in Marin county.
In1998 a single patch of S. alterniflora was identified in the native S.foliosa marsh at Blackie's Pasture in Tiburon. In 2004 the marsh, approximately 0.85 acre in total area, had been fully invaded with an estimated 0.61 acre of S. alterniflora-hybrids, as well as 0.01 acre of S. densiflora.
S. alterniflora/hybrids are coalescing to convert mudflats to a cordgrass meadow at the Elsie Roemer Bird Sanctuary on Alameda Island.
Restoration Sites Impacted
Alameda County hosts several of the oldest and largest S. alterniflora hybrid invasions in the estuary. Many restoration projects have been invaded along the Hayward Regional Shoreline, flood control channels are choked in Fremont and San Lorenzo, and mudflats in San Leandro Bay and Alameda Island are being replaced with meadows of S. alterniflora/hybrids. For example, in 2004 S. alterniflora/hybrid covered an estimated 18 and 25 acres of Oro Loma and Cargill Mitigation Site. 138 acres of S. alterniflora have in invaded the Coyote Hills Slough (AFCC Federal Project) and 12 acres have invaded the mudflats of Elsie Roemer Bird Sanctuary in Alameda Island.
Alameda Flood Control Channel 2000
Alameda Flood Control Channel 2003
Alameda Flood Control Channel 2005
Spartina alterniflora/hybrids were continues to be found in fragment marshes of highly urbanized areas (such as San Francisco's India Basin).
S. alterniflora/hybrid Transplant
San Bruno Slough/Colma Creek: S. alterniflora/hybrids reputedly transplanted from "Pond 3" restoration site in Fremont to Colma Creek area, date unknown. In 2004, the area represented one of the heaviest S. alterniflora/hybrid infestation sites in the San Francisco Bay, totaling 54 solid acres of non-native cordgrass.
Cargill Mitigation Site
S. alterniflora hybrids are rapidly spreading within the Alameda Flood Control Channel-Federal Project increasing the risk of upland flooding.
S. alterniflora Introduction
Pond 3: Site of initial introduction of Spartina alterniflora into San Francisco Bay. Seed was sown as part of restoration project in early 1970's. Plants quickly became established, and began to spread along bay shore.
Scattered Clones
Though S. alterniflora / hybrids have spread further into the South Bay than previously thought, populations are still sparse south of the Dumbarton Bridge, with only scattered individual clones found along the shoreline and in sloughs. The Santa Clara Valley Water District Invasive Spartina Control Program estimated a total of 3.94 acres in 2004.
Funding Provided By:
Coastal Conservancy
CALFED BAY DELTA PROGRAM
Coastal Programs
Contributors:
UC Davis Spartina Lab, San Francisco Estuary Institute
County Lines
Major Highways
State Highways
Mud Flats
Deep Bay
Shallow Bay
Public, Privately Protected Lands and Wildlife Refuges
Developed Land
Basemap sources:Bay Area Open Space Council (2005) public lands layer; San Francisco Estuary Institute EcoAtlas (2001), marsh and mudflat map layers; FMMP(2002) urban data.
NAPA
SONOMA
SOLANO
MARIN
SAN FRANCISCO
SAN MATEO
ALAMEDA
Napa-Sonoma Marshes
American Canyon
Sandpiper
San Pablo Bay National Wildlife Refuge
Montezuma Slough Unit
Crescent Unit
Grizzly Island Wildlife Area
Novato
San Pablo Bay State Wildlife Area
Vallejo
Benicia State Recreation Area
Benicia
Goodyear Slough Unit
Marsh
Crockett
Lone Tree Point
Marina Park
Point Edith Wildlife Area
West Pittsburg
Martinez Regional Shoreline
Point Pinole Regional Shoreline
Point Pinole
Pinole
China Camp State Park
San Rafael
Albert Park
Pickleweed Park
Richmond
San Pablo Creek
Creekside Park
San Rafael Bridge
Corte Madera Marsh Ecol. Reserve
Town Park
Mill Valley
Ring Mountain Preserve
Paradise Beach
Miller Knox Regional Park
El Cerrito
Point Isabel
Albany Point
Albany
Bothin Marsh
Blackie's Pasture
Tiburon
Berkeley
Aquatic Park
Sausalito
Golden Gate National Recreation Area
Emeryville Crescent
Treasure Island
San Francisco Bay Bridge
Oakland Army Terminal
San Francisco
Naval Supply Center
Alameda
Crown Memorial State Beach
Oakland
Elsie Roemer Bird Sanctuary
Shoreline Park
Pier 98
Candlestick
Oyster Bay Regional Shoreline
San Leandro
San Lorenzo Creek
Brisbane
San Bruno Point
San Lorenzo
Colma Creek
Oro Loma Restoration Site
Sam Trans Terminal
Hayward Regional Shoreline
San Francisco International Airport
Hayward
Burlingame Lagoon Park
Coyote Point
San Mateo Bridge
Union City
Burlingame
Bayfront Shoreline Park
Pond 3
Bayside Joinville Park
Foster City
Coyote Hills Regional Park
San Mateo
Bair Island
Fremont
Newark
Redwood Shores Ecological Reserve
Don Edwards Ntl Wildlife Refuge
Greco Island
Ravenswood Baylands
East Palo Alto
Baylands Preserve
Mountain View Shoreline Park