

Success in the Marshes

By Sandy Goldman
2025

For the past 20 years Friends has been active in removing non-native cordgrasses (*Spartina* species) from our marshes, with great success. The reasons for eliminating invasive cordgrasses are many. Invasive *Spartina* outcompetes native tidal marsh species to create a monoculture. It spreads rapidly across open mudflats, creating meadows of cordgrass that reduce foraging opportunities for shorebirds, waterfowl, and other aquatic species. It reduces flood control capacity, as dense stands accrete sediment rapidly in unnatural locations, fill in storm water drainages, and cause flooding in adjacent fields, homes, and businesses. These dense *Spartina* meadows cause ponding that promotes increased breeding of mosquitoes.

The San Francisco Estuary Invasive *Spartina* Project (ISP) is a regional effort, led by the California State Coastal Conservancy, California Invasive Plant Council, and the U.S. Fish and Wildlife Service. Project partners work together to protect the Bay's coastal biological resources by removing invasive species of cordgrass. Through partnerships in all nine Bay Area counties, the project team works across 70,000 acres to restore tidal marsh habitat by monitoring and treating invasive *Spartina*, enhancing habitat with native plants and high-tide refuge islands, and monitoring California Ridgway's rail populations.

One native and four non-native species of cordgrass are found in the San Francisco Estuary. The native species is Pacific cordgrass (*Spartina foliosa*), which is the only low marsh native plant in the Estuary. The non-native species are Atlantic smooth cordgrass (*S. alterniflora*), English cordgrass (*S. anglica*), Chilean cordgrass (*S. densiflora*, referred to as densi by those working in the trenches), and salt-meadow cordgrass (*S. patens*). Two, *S. anglica* and densi, were planted by mistake at Creekside Marsh in the early 1970s during restoration. *S. anglica* did not spread beyond the immediate area of Creekside Marsh, but densi spread aggressively up and down the creek in areas disturbed by construction of the US Army Corps of Engineers flood control project. Although *S. alterniflora* is the major problem else-where in the Estuary, there were only minor infestations along Corte Madera Creek. *S. patens* was never found along Corte Madera Creek.

The genus *Spartina* hybridizes readily, leading some biologists to describe it as promiscuous. As time has gone by, more and more of the problem plants are hybrids between the invasives and the native. These plants can look like either parent or a combination of the two and DNA analysis is often required to correctly identify cryptic plants.



Members of the North Bay Conservation Corps remove *Spartina densiflora* adjacent to Larkspur Marina. Photo by Charles Kennard



A Ridgway rail forages among cordgrasses in a marsh near the mouth of Corte Madera Creek. Photo by Charles Kennard

The infestation along Corte Madera Creek varied from mono-culture strips fringing marshes, extensive monoculture stands in Creekside Marsh at Hal Brown Park, and spotty distributions where the infestation was spreading rapidly.

This work protects the major investments made by agencies around the Bay to restore native tidal wetlands. Since 2003, Friends has served as the coordinator for the ISP effort in Corte Madera Creek, with funding from the California Coastal Conservancy.

Friends was involved in the fieldwork for the first decade, hiring crews to conduct much of the work. We also contacted property owners to obtain permission to treat the invasive cordgrasses on their property and we continue to keep them in-formed about surveys and field work. The ISP staff since the beginning has conducted surveys to document where treatment continues to be needed. Their expertise is crucial.

Initially, it was thought that herbicide would be adequate to control the infestation. However, it quickly became clear that densi, with its slightly waxy, rolled leaves, was not susceptible to herbicide. It is a bunch grass, so digging became the best option and we dug literally tons and tons of it. We sometimes mowed it to reduce the volume to be removed from the marsh. Two areas with major infestations, Creekside Marsh and Piper Park, have resident populations of Ridgway's rail, so digging could not be done between February 1 and August 31, a serious constraint when we wanted to stop seed set by the invasives.

Sometimes, to stop seed set, densi was sprayed with herbicide and then dug later in the year. *S. anglica* and *S. alterniflora* both spread by their rhizomes, so digging was not effective for established plants. Fortunately, they can be con-trolled with herbicides.

The results of this effort have been impressive. The report for the surveys conducted in 2024 state, "Just one densi detected" in the immediate Corte Madera Creek watershed. Zero detection doesn't necessarily mean that we won't find any in the next round, sprouting from residual seeds. The challenge of this work over a long enough period to prevail. We need to be more persistent than the invasive plant, and that is a high bar!

When the infestation gets down this low, the number of plants detected can vary from year to year, before finally settling on zero. Climatic conditions come into play, as do detection issues (these are often small plants that it takes an expert to find among the other marsh vegetation), and unknowns. What exactly causes a densi seed to sprout in a given year, after 3-5 years of sitting around in the substrate? Fortunately, for densi the goal of extermination appears to be within reach, and for densi hybrids and *S. anglica* as well.



An expanse of cordgrass in Creekside Marsh. Photo by Sandy Goldman

*Any use of text or photographs for other than personal purposes is prohibited without permission from Friends of Corte Madera Creek Watershed Friends of Corte Madera Creek Watershed P.O. Box 415, Larkspur, California 94977
info@friendsofcortemaderacreek.org*