

San Francisco Bay: Massive effort to remove aquatic invader nearly finished

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Eleven years ago, it was a major threat to San Francisco Bay.

A fast-growing, non-native plant that spread in dense thickets up to 7 feet tall was exploding out of control, overrunning wetlands, threatening birds, wildlife and even the public's view of the water.

But now after what is believed the most extensive campaign ever launched to eradicate a non-native species in San Francisco Bay, the invader has been sent into retreat, its area reduced 97 percent, from 805 acres in 2005 to 28 today.

"It's been a resounding success. We're in the last phases now," said Anne Morkill, manager of the San Francisco Bay National Wildlife Refuge Complex.

The culprit, Atlantic cordgrass, was planted in 1973 by the Army Corps of Engineers to control erosion and restore a marsh as part of a flood-control project at Alameda Creek in Fremont. But the plant, also known as *Spartina alterniflora*, spread in ways the Corps never expected, crossbreeding with native Pacific cordgrass, which grows shorter and less dense. The horticultural blitzkrieg reduced the amount of food and shelter for birds and other wildlife around the bay.

Every year, thousands of birds, including avocets, terns, ducks, dowitchers and godwits, go to the bay's mud flats when the tide is out to forage for snails, shrimp, worms and other food. As the mud flats became thick meadows of invasive spartina, the birds had less food. Also, because of the plants' extensive root systems, the creatures that live in the mud and provide the food also were being forced out.

"It's biological pollution," said Marilyn Latta, manager of the invasive spartina project for the California Coastal Conservancy, a state agency based in Oakland. "The wetlands were at risk of becoming single monocultures."

From kudzu vines that smother forests in the South to star thistle on Western rangelands, to Mediterranean fruit flies and Formosan termites, invasive species cost the United States an estimated \$120 billion a year, according to a Cornell University study.

In the Bay Area, scientists worried that left unchecked, the non-native cordgrass would ruin years of efforts and hundreds of millions of dollars spent to painstakingly restore wetlands and

convert former industrial salt evaporation ponds back to natural marshes for ducks, fish, harbor seals and shorebirds.

So in 2005, the conservancy launched a massive program to get rid of it.

Working with more than 200 cities, counties and non-profit groups, along with the U.S. Fish and Wildlife Service, the conservancy distributed state and federal funds to hire crews to spray the cordgrass with a low-toxicity herbicide from helicopters. Other workers waded through waist-deep water to pull or cut it by hand. Others used rototiller-like tools to grind it up, along with air boats and backpack sprayers.

The work area: Roughly 70,000 acres, a footprint nearly three times the size of San Francisco. Total cost of the project is \$30 million so far, most from state bond money and federal funds.

“It is incredibly difficult to physically access some of these areas,” Latta said. “We can’t go in at high tide when the plants are submerged, and if anyone’s ever walked through a mud flat in boots they know they can sink quickly. But it’s important to do. We can’t miss any seedlings.”

Before an area can be certified as spartina-free, it must be inspected three years in a row.

In recent years, the program has shifted mostly to restoration. Crews have planted more than 400,000 native plant seedlings, including native spartina, marsh gum plant and *Grindelia*, a wetland species with yellow flowers.

The spraying took place in marshes and sloughs off Alviso, Hayward and Fremont. It occurred around Alameda Island; at Bair and Greco islands off Redwood City; along the shore from Brisbane to Foster City; off Palo Alto Baylands park and around Colma Creek near San Francisco International Airport. Other spraying happened in the Point Pinole marshes in Contra Costa County, and in several areas off San Francisco and Marin counties.

Although environmental groups had early concerns about the herbicide, imazapyr, studies showed low risk. In 2004, scientists from the San Francisco Estuary Institute, an independent research group in Oakland, sampled waters off Bair Island and Fremont immediately after imazapyr was sprayed on invasive cordgrass as part of a pilot project. They found concentrations of 7 to 8 parts per million in the water — levels that are 1,000 times less than published studies have shown can kill rainbow trout, water fleas and other aquatic life.

Of the 28 acres of invasive spartina left, the highest densities are near Hayward, San Leandro and Alviso, Latta said, with some in Outer Bair Island in Redwood City.

But it can’t all be eradicated at once. A few years ago studies found an endangered bird species, the California clapper rail, also called the Ridgway’s rail, was nesting in some of the invasive spartina thickets. Killing it all would expose the birds, which number fewer than 1,000 around the bay, to foxes, feral cats and other predators. So federal officials required removal to be slowed so the native plants would have time to grow and provide new habitat.

The goal now is to have all of it eradicated in five to eight years, said Latta. Removing it is a big part of the ongoing effort to restore the bay, experts say.

“The bay has changed so much,” said Donna Ball, habitat restoration coordinator for Save the Bay in Oakland. “We need to make sure now that we have a system that is a healthy place for plants and animals and for us. We’ve come a long way, but we need to continue to take care of it.”

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