



Decker Island Wildlife Area: Enhancing Delta wetlands one phase at a time

Arriving by boat and traversing the levee slope in the spring of 2000, I climbed to the top of the island to walk a short distance to a site perched high and dry, 20 feet above sea level. This was one of the Department of Fish and Game's (DFG's) wildlife areas designated for restoration — Decker Island. Gazing

By Mark Philipp

across the island, my attention was drawn to one thing, a sea of yellow star-thistle. This invasive plant grows about 3 feet tall, with 30-100 spiny flowers per head, each growing almost an inch long. As I quietly scanned the island with my binoculars I could think of only two things: first, based on the quality of the existing vegetation, wildlife values were minimal; and second, what possessed me to wear shorts? It became very apparent that the restoration planned for Decker Island could only enhance fish and wildlife habitat.

Decker Island, a 648-acre island, sits in the San Joaquin-Sacramento Delta in Solano County, just south of Rio Vista, surrounded by the Sacramento River and Horseshoe Bend. The island was created in the early 1900s when the Sacramento River was dredged and the spoils were placed on top of existing wetlands.

Today, it is hard to imagine that the lush site, thick with a variety of native plants and habitat had been a sea of star-thistle just years ago. Climbing to the top of the island now has a new purpose, gaining a vantage point to view many of the trees, shrubs, and tules which have grown well above my head.

DFG owns the northernmost 33 acres of Decker Island. Since 1999, DFG and Department of Water Resources (DWR) have been working together to re-establish and enhance wetland and upland habitats to benefit various species of fish and wildlife. Partnered with and funded by DWR, the Decker Island Enhancement Project offers a unique opportunity to

combine habitat development with levee rehabilitation on nearby islands. Phase I consisted of the development of the initial 15 acres, while Phase II, presently being developed, will expand enhancement to an additional 15 acres.

The DFG/DWR Delta Levees Program, part of a Delta wide levee maintenance program, is guided by Assembly Bill 360, which requires that every expenditure of funds for levee maintenance results in a "net habitat improvement." Projects like Decker Island ensure that habitat improvement mandates are met.

During Phase I, excavated material was transported to both Twitchell and Webb Islands for levee rehabilitation. In the spring of 2004, during the development of Phase II, 270,000 cubic yards of material were excavated and transported to nearby Bradford and Jersey Islands for levee rehabilitation projects. Many of the islands, particularly those in the western portion of the Delta, play an important role in keeping salinity levels balanced and require regular maintenance to meet specific levee standards.

Phase I development finished in December of 2000 with the planting of over 45,000 native plants. Prior to planting, the Phase I site was contoured from the existing 20 feet in elevation to -5 feet below sea level at the bottom of the channels. A total of six shallow water channels were excavated around a central island which transitions to upland habitat. These channels were opened to tidal action in October of 2001, when a levee section was breached along Horseshoe Bend.

Habitat in Phase I consists of open shallow water channels, lined with thick stands of tules, sedges, willows, and alders. A gradual transition, using local native plants, including Fremont cottonwood, various willow species, oaks, alders, elderberries, coyote brush, and many other woody species make up much of the riparian and upland areas. After four years of growth, many trees are now over 20 feet tall. Understory and



Phase 2 break location under development.



Phase 2 break location after completion.

DFG photos by Mark Phillip



Before and after photos of water hyacinth control by the Department of Boating and Waterways. The opening to Decker Island along Horseshoe Bend had been breached two years earlier.



Left, Decker Island at the beginning of restoration. Right, Decker Island as it appears now.



DFG photo by Joe Fierra

Todd Gardner and Mark Phillip seine a channel for a fish survey.

open areas were planted with various grasses and herbaceous species which have flourished, filling many previously bare areas.

DFG and DWR biologists have observed many species of wildlife within Phase I. Mammals observed include: river otters, mink, beavers, coyotes, mice, and voles. Many birds have been observed including various species of raptors, waterfowl, songbirds, and shorebirds. Pacific tree frogs have been observed as have western fence lizards and a single gopher snake. Habitat development on Decker will continue to host an even greater variety of wildlife, providing even more nesting, roosting, foraging, and brood rearing habitat as well as cover

from predators. Successes of restoration projects often hinge upon controlling invasive plants, which compete with native plants for light, space, and water. Although many weed species are of concern on Decker Island, perennial pepperweed (*Lepidium latifolium*) and yellow star-thistle (*Centaurea solstitialis*) pose the biggest threat to the establishment of native plantings. Perennial pepperweed typically dominates more saturated soils, while yellow star-thistle dominates the higher and drier areas. Without control, both plants could have easily out-competed the thousands of plants initially installed. Joel Trumbo, DFG's state Pesticide Use Coordinator, recommended strategies for control.

In 2001, with the assistance of my DFG colleagues and cohorts from DWR, I molded these strategies into a control program, which has resulted in a significant reduction of both pepperweed and yellow star-thistle. Beginning in the fall of 2001 through the spring of 2004, a 97 percent reduction in pepperweed has been observed. From the spring of 2002 through the spring of 2004, a 77 percent reduction of yellow star-thistle has also been recorded. Taking a committed role in actively managing invasive plants has led to this early success.

Two invasive aquatic plants, Water Hyacinth (*Eichornia crassipes*) a surface floating plant, and Brazilian water weed (*Egeria densa*) a submerged aquatic plant,



Restoration included eliminating invasive (nonnative) plant species.



Todd Gardner and Joel Trumbo show the extent of the pepperweed root system.



With the nonnatives removed, plants like hibiscus repopulate the island.

DFG photos by Mark Phillip

have appeared in the channels of Decker Island. Both plants are fast-growing and can pose severe problems, not only to boaters, recreational users, farmers, and marinas, but also to many native fish species that require adequate dissolved oxygen to survive. Large mats of hyacinth and *Egeria* can severely reduce the amount of dissolved oxygen available in these channels.

In the late summer of 2003, hyacinth invaded the site, filling over 90 percent of the channels. During the winter of 2003/04 the Department of Boating and Waterways (DBW) mechanically removed nearly all of the water hyacinth from the channels. Although some hyacinth re-established in the spring of 2004, that summer DBW sprayed the hyacinth with herbicide, reducing plant material and further propagation in Phase I.

Egeria is another problem in many areas of the Delta. It is an introduced species, often used in household aquariums. Unfortunately, the contents of these aquariums are often dumped into local waterways, where this hearty plant can re-establish and flourish. *Egeria* typically grows in shallow water, but can grow at depths up to 20 feet. There is no easy control for *Egeria*. The plant reproduces vegetatively and grows in fragments or segments. When broken off by a boat propeller, for example, these fragments may float to a new location or re-establish on site. For this reason, mechanical control is not very effective, unless all the plant material can be removed. Permitting of an herbicide control program for *Egeria* is currently being evaluated by DBW. DFG will continue coordination with DBW to assess control methods available.

A five-year fish-monitoring program is in its second year to evaluate fish use in the channels of Decker. Headed by DFG's Bay-Delta Branch and the DFG Delta Levees Program, sampling has consisted primarily of beach seining the channels within Phase I. Monitoring the recently excavated channels in Phase II has just begun. Other sampling methods, such as electro-shocking and light traps will also be used to inventory fish. Todd Gardner, with DFG's Delta Levee Program, is conducting bathymetric surveys within Phase I to evaluate changes in channel configuration over time. It is important to determine if the channels are gaining sediment with seasonal and tidal flows, or



A great blue heron forages on Decker Island.



Suisun Marsh aster.



Canada geese visit the island to feed and rest.



Waterfowl nest on the island.

DFG photos by staff

if the site is eroding, growing deeper, and losing sediment. This information will help guide additional restoration in the future.

Phase II of the Decker Island Project is now underway, continuing wetland restoration by connecting and extending a long main channel from Phase I, with several small stems. This phase was designed to flood twice a day by tidal action, rising over the channels and flooding much of the wetland, creating an intertidal zone. The site will be completed by the winter of 2006,

including the installation of native plants. Maintenance and monitoring, including irrigation and invasive weed control, will continue at least through 2009. Fish monitoring will also continue, evaluating fish use within Phase II.

The Decker Island Enhancement Project continues to enhance fish and wildlife habitat by recreating wetlands that were once lost. The DFG Levee Program is looking for opportunities to expand these projects to adjacent sites on Decker Island and other locations within the Delta.

Phase I has added valuable insight into the planning processes for Phase II and future enhancement projects, including early success of invasive plant control. During restoration, Decker Island Wildlife Area is closed but when it is fully restored, it will offer tremendous new recreation opportunities when the wildlife area is reopened to the public. 🐾

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