



# RESTORING *Decker Island*

by Annie Parker

Photos by North Delta and  
Levees Program Staff

The Sacramento-San Joaquin Delta is a veritable maze of islands and levees with a rich wildlife population, a growing human population, and is a highly important part of the California State Water Project. Decker Island is a 648-acre tract of land in the Delta located in Solano County, which over the past five years has been the site of many improvements to help flood control, water quality, and the native habitat.

Decker Island was formed in the early 1900s when dredging separated a wedge of marshland from Montezuma Hills. Material dredged from the Sacramento River to improve flood control was stacked on top of the isolated marsh thereby creating Decker Island, one of the highest spots in the Delta. The restoration of habitat at Decker Island, which includes removing some of the previously deposited material, satisfies the habitat enhancement goal described in 1996 California Statutes, Chapter 601, part of Assembly Bill 360 that was authored by former DWR Director **Thomas M. Hannigan**.

“Decker Island has the perfect win-win situation because we were able to use the material to strengthen other levees, and in

the same process create valuable habitat in a critical part of the Delta,” said **Curt Schmutte**, Chief of the North Delta and Levees Program, which is leading the restoration and levee project.

## Repairing the Riparian Forest: Phase I

Before the transformation of the Delta from wildlands to agricultural gold, riparian forests were common in the Delta, due to the intermeshing systems of water and land.

“A riparian forest is that woody vegetation structure that grows in association with a river corridor and its floodplain,” said **Kent Nelson**, the project manager on Decker Island who deals specifically with the biological aspects of the project.

In 1999, DWR employees at Central District began the first phase of the project, transforming a 34-acre, Department of Fish and Game-owned parcel at the north tip of Decker Island into diverse wetlands and riparian habitats. Over 350,000 cubic yards of material were removed from the site and transferred to help rehabilitate the levees on Twitchell Island and Webb Tract.



**Above:** (Left to Right): Fish and Game's Mark Phillip along with Bay-Delta Office's Bob Yeadon and Jim Eckman observing the opening of wetlands to the Sacramento River.

**Photo on page 8:** At the north end of Decker Island, Beaver cages were placed for the newly planted trees.

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a resident Delta expert on regional habitats. Plants that were used are local to the Delta and include natural growing willows, cottonwoods to create a forest, coyote grass, and lots of tules around the waterline.

On the Horseshoe Bend side of the site, a breach was created in October 2001 that allowed the Sacramento River to flow into the awaiting wetlands. The new free-flowing water from the river allows water to circulate in the habitat site with the tidal cycle.

“The Decker Island Habitat Enhancement Project provides a unique opportunity to couple levee rehabilitation with habitat improvement,” said **Bob Yeadon**, a Senior Engineer in the Bay-Delta Office.

To help recreate tidal wetlands and associated habitat on the excavated sites, DWR enlisted the assistance of **Jeff Hart**,

**Below:** A breach was created to allow the Sacramento River to flow into the awaiting wetlands.



“Our staff here coordinated with Fish and Game, and various botanical experts who are familiar with ecosystems in the Delta to develop the planting scenarios,” said Kent.

## The Ongoing Rehabilitation: Phase II

After the success of Phase I, the effort to restore more of Decker Island has continued to grow. Partnered with DFG, the Delta Levees Program will re-establish habitat on the remaining 15 acres of the 34-acre, DFG-owned site. The 270,000 yards of material to be removed for Phase II will be used to rehabilitate levees on Jersey, Bradford, and Van Sickle islands.

“We have a need for huge quantities of material to be able to restore levees. These islands are already below sea level, and you don’t want to take additional land off them to make them even deeper. Decker Island is one of the few spots in the Delta that is actually well above sea level,” said Curt.

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*After Phase II's completion, Edward Schmit takes soil samples.*

The construction on the land will take about a year, and then there will be a number of years for the habitat to establish itself on the island. But after Phase I, the success of the habitat restoration is evident with the proliferation of native vegetation and wildlife that now visits the island.

"Our biologists have seen river otters, raccoons, Swainson's hawks, harriers, migratory songbirds, numerous reptiles, and both native and non-native fish species," said Bob.

## Looking Ahead: Phase III

In the future, DWR is coordinating with the California Bay-Delta Authority and other agencies to restore an additional 400 acres of the land, which would cover almost all of Decker Island. If DWR is able to purchase the additional land, the Phase III part of the restoration will begin in a few years.

"We hope to continue restoration on the remainder of the island employing the principles of adaptive management - learning from each phase of this effort," said Bob.

Since part of the land that is being restored on Decker Island belongs to the Department of Fish and Game, DWR and DFG employees have been working together for habitat improvement. Among the DFG employees are **Bob Orcutt**, **Todd Gardner**, and **Mark Phillips**.

DWR also has recently teamed with personnel from the U.S. Fish and Wildlife Service, research scientists from U.C. Davis,

## Strengthening the Island

*Approximately a year after completion of a 15-acre wetlands habitat restoration project on the interior of Decker Island, DWR employees were faced with a new problem on the waterside. Along the northern bank of the project area, Sacramento River currents and wind-driven waves were scouring the fragile soils of the island. The erosion was so severe that the 8 foot vertical bank made of a sandy silt material had receded over 50 feet in less than 10 years and, if left unchecked, would eventually impact the restored area.*

*"This project, in cooperation with the Department of Fish and Game, was designed to test the utility and effectiveness of alternatives to the conventional use of rock rip-rap," said **Tom Hall**, a Staff Environmental Scientist who worked on the project.*

***Jim Eckman**, an engineer from the Delta Levees Program, and Tom, in collaboration with DFG, determined that driftwood logs and other debris being*

*driven into the toe of the bluff were the primary cause of the severe erosion. Their goal was to build an experimental structure tough enough to resist the beating but that would be hospitable to new vegetation and wildlife.*

*The erosion control structures were created with vertical hexagonal tubes of high-density polyethylene mesh with internal support structures and lined with filter fabric. Eight tubes were factory welded into modules two feet wide by four feet deep in a stair-step arrangement from two to six feet tall. The modules were embedded along 60 feet of the vertical earthen embankment and anchored with stainless steel cable and "duckbills" that were driven three to five feet into the face of the bluff.*

*A 16-person labor crew from the California Department of Forestry and Fire Protection worked in October of 2002 to clear the debris piles that had accumulated in the "scour pit" and to excavate and level the soil so the supports would sit evenly on the beach and be protected from undercutting.*

California Bay-Delta Authority, and **Andy Rockriver** and **Mike Healey**, fishery experts from DFG.

The Delta Levees Program is under the Bay-Delta Office, formerly known as the Office of State Water Project Planning, and has many employees who have been involved in the Decker Island project, including **Dave Mraz**, **Bill Heyenbruch**, **Edward Schmit**, **Jim Eckman**, **Dave Showers** and **Tom Hall**. **Lenny Grimaldo** of the Division of Environmental Services North Levees Program has also been involved.

The future of Decker Island and Delta restoration is promising.

“Some of the research we do on Decker may help guide our restoration planning at Dutch Slough and other future restoration projects,” said Curt.

When asked if this project will have a positive effect on future Delta restoration efforts, Engineer **Joel Dudas**, the project GIS specialist who provides mapping and analysis to monitor



*Above: During Phase II, 270,000 yards of material was removed from Decker Island and used to rehabilitate other islands' levees.*

*Below: Jim Eckman and CDF crews place internal support structures to strengthen Decker Island.*

erosion rates and plant survival on the islands, said,

“Absolutely. We have been able to learn through the ongoing effort from Phase I about what is successful and apply it to Phases II and III.” ■

*After installing filter fabric in the trench footing, the restoration crew installed, anchored, and backfilled the modules with native material and transplanted native grasses. Since Decker Island is subject to extreme tides and winter storms which inundate the work site, the crew had to work in the fall, when the environmental conditions were appropriate and their fire-fighting calls were reduced. “The site conditions made the use of power equipment impossible. It made sense to use the CDF crew and they did a terrific job. They worked hard, offered suggestions, and were adaptable to plan changes as they became necessary,” said Jim.*

## Success

*For the next five years, the Decker Island Levee Bank Erosion Reduction Project will be monitored to measure the success and effectiveness of this demonstration project. Since this method is a prototype for new systems of erosion control in the Delta, and it is a low-cost program to achieve a sound solution, there is great promise for similar projects.*

*After almost one year in service, the modules show evidence of the severity of the constant pounding from wave-driven logs, but survive intact and have proven to be great hosts to thriving native grasses, planted willows, and other vegetation. Erosion of the bluff behind the modules has been reduced significantly and is not a threat to the integrity of the restored habitat area.*

