







## RESTORATION DESIGN

Our firm has been actively involved in restoration since before the term “restoration ecologist” was invented. We were among the pioneers of wetland restoration in the San Francisco Bay Area in the 1970s and have 30 years of continuous experience designing and implementing tidal and seasonal wetlands and riparian habitat. We championed the cause of tidal marsh restoration in San Francisco Bay, and helped design and implement the Bay Area’s first major tidal restoration project, the 260-acre Warm Springs project in Fremont.

Our restoration work includes close to 500 projects for local, state, and federal agencies and private clients. Our projects are often cited as examples of how to restore wetlands (Westlake Farms Wetland Demonstration Project) and how to properly monitor restoration sites (Route 85 Long-term Monitoring Plan). Our long-term restoration monitoring plan for one of the largest riparian habitat restoration projects in Santa Clara County (24 acres) has been used by the U.S. Fish and Wildlife Service as a template for other monitoring programs. Moreover, our restoration sites routinely exceed established success criteria, and are cited as cited as examples of successful mitigation and restoration.

Our restoration ecologists include widely recognized experts in tidal and seasonal wetland and riparian restoration. They work closely with our other in-house biological experts in interdisciplinary teams that are often augmented in the design phase by other professionals, including hydrologists, geomorphologists and engineers. We also provide our clients support throughout the design process, from conceptual design through the production of construction documents and specifications, via our in-house landscape architecture staff. Once the designs are completed, we routinely assist during pre-implementation phase by coordinating nursery operations, during the implementation phase by providing on-site monitors, and during the post-implementation phase by providing long-term monitoring.

## RESTORATION DESIGN PROJECTS

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### ROUTE 85 MITIGATION PLANNING AND DESIGN

- *Santa Clara County*

The Route 85 project was a transportation corridor (freeway) stretching 18-miles through southern Santa Clara County, and crossing numerous streams and rivers. Mitigation for wetland and riparian impacts comprised three sites: 1) the 24.5 acre site on Coyote Creek; 2) the 9 acre site on Los Gatos Creek; and 3) the 1 acre site on Guadalupe Creek. We completed the conceptual restoration design work for all projects, coordinated the final design plans, and developed the detailed Mitigation and Monitoring plans for the U. S. Army Corps of Engineers. The monitoring Plan has since been used by the U. S. Army Corps of Engineers and the California Department of Fish and Game as a template for developing monitoring protocols for other similar riparian mitigation projects. We implemented the monitoring plan, and conducted the first two years of monitoring. This project received all its approvals, and has been constructed. Over 25,000 trees and shrubs were installed. The site has exceeded all plant growth success criteria to date.

*Clients: David J. Powers & Associates, Orsee Design Associates, Santa Clara County Traffic Authority, San Jose State University Foundation*

### BAIR ISLAND TIDAL WETLAND RESTORATION AND MANAGEMENT PLANNING - *San Mateo County*

Bair Island comprises approximately 3,200 acres of former salt evaporation ponds on the west side of San Francisco Bay. Approximately 1400 acres of Bair Island were recently acquired and added to the San Francisco Bay National Wildlife Refuge, with the goal of restoring the area to tidal marsh. H. T. Harvey & Associates is leading the team that is designing the tidal restoration and developing the Restoration and Management Plan for the site. Physical and biological existing conditions reports and a list of management objectives were produced prior to the start of restoration planning. We analyzed the opportunities and constraints to restoration and prepared a document detailing the restoration and public use alternatives for Bair Island. The restoration alternatives were presented to the Technical Review Team and three alternatives were selected for further analysis. Additional hydrologic and sediment studies are underway. A Restoration and Management Plan and EIR/EIS detailing the three alternatives are currently being developed.

*Client: San Francisco Bay Wildlife Society.*

GUADALUPE RIVER PARK RIPARIAN RESTORATION - *Santa Clara County*

The four mile long Guadalupe River Park winds throughout the heart of San Jose and is a major focus of Downtown Redevelopment. It is a combination of meandering streamside trails, off-channel high use areas (museums, arenas) and streambed and riparian restoration sites. We prepared the biological section of the EIR for the River Park between Highway 280 and Highway 880, including baseline characterization of the riparian vegetation, mapping of the principal plant associations and evaluation of fish populations and habitat. During the site design process our staff biologists and hydrologists provided input on: avoidance of sensitive habitats, restoration techniques for riparian vegetation and streambeds (fisheries spawning beds), detailed tree surveys, species selection and establishment recommendations for both landscaped and riparian mitigation areas, biological review of landscape plans, plant material procurement assistance, recommendations for plantings in gabion wire baskets, and regulatory permitting. We also developed a final detailed Mitigation and Monitoring Plans for Zone B and D that were successfully used as the basis for the project's U.S. Army Corps of Engineers permit. During construction, we conducted weekly site monitoring for regulatory permit compliance and to assist in the proper installation of the mitigation sites. We are currently monitoring the riparian mitigation sites on an annual basis.

*Client: Hargreaves Associates and the City of San Jose Redevelopment Agency*

HIGHWAY 237 WETLAND MITIGATION SITE  
- *Santa Clara County*

This 48-acre site provides mitigation for impacts to wetlands caused by construction along Route 237. The site comprised seasonal wetlands and grasslands behind dikes. We developed the restoration plan in concert with Philip Williams & Associates and participated in the final engineering design. The restoration design is for the site be flooded several times annually via weirs on culverts connecting the site to Calabazas Creek and San Tomas Aquino Creek. Flows are directed across the site through a series of three ponds, each having different salinities, vegetation, and wildlife habitat values. The uppermost pond supports cattails, bulrush, and other brackish marsh plants. The middle pond supports pickleweed, saltgrass and a number of other seasonal wetland plants. The lowest pond supports open water, with a fringe of salt marsh plant species such as pickleweed, alkali heath, and salt grass. We designed and implemented a long-term program that monitored the site's soils, vegetation, and wildlife. The site was restored, and early monitoring results were very promising, with many of the success criteria met within the first year.

*Clients: Philip Williams & Associates, Caltrans via the San Jose State University Foundation*

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### 1990 BAY ROAD/COOLEY LANDING: T&E SPECIES SURVEYS, RESTORATION DESIGN, PERMITTING - San Mateo County



The 1990 Bay Road Site in East Palo Alto is a contaminated site that contained some seasonal wetlands and adjoins the tidal Laumeister tract. We began working on the site in 1989, conducting initial studies to describe possible impacts of remedial actions required at the site, and to characterize the Laumeister Tract. We carried out surveys for special-status animals and their habitats, including California Clapper Rail and the salt marsh harvest mouse. Subsequently, we worked on the development of a tidal restoration plan for the nearby 115-acre Cooley Landing inactive salt pond as mitigation for impacts (direct and indirect) of the contamination and cleanup. An innovative approach to the restoration was developed that maximized the formation of a multi-ordered channel network for the creation of California Clapper Rail habitat. We participated in the development of restoration alternatives and in the refinement of the preferred alternative. We completed a wetland delineation of the Cooley Landing site and compiled the permit package for the salt marsh restoration project, including the Biological Assessment in support of the Section 7 conservation. The restoration plan was

approved, and tidal action restored to the site in 2000. Initial observations indicate that the restoration is proceeding as planned, and that success criteria will be met or exceeded.

*Client: Geomatrix, Inc., Jenkins, Sanders & Associates for Rhone Poulanc, Inc.*

### SCVTA CONSOLIDATED RIPARIAN RESTORATION PROGRAM - Santa Clara County

The Santa Clara Valley Transportation Authority (SCVTA) is developing 10 transportation improvement projects in Santa Clara County. These projects will impact various streams and rivers within the County. We prepared habitat restoration and monitoring plans for two sites as the consolidated mitigation program for these 10 projects. One site (referred to as the Riverside Drive site) is a one-mile degraded reach within the Coyote Creek Parkway. This complex restoration design integrates extensive background studies on hydrology and geomorphology (conducted by our sub-consultant Philip Williams & Associates), groundwater studies, wildlife surveys, soils analysis, and an adaptive management restoration approach. The reach is subject to large variations

in groundwater elevation and potential channel and floodplain reconfiguration during flood events. Our restoration design incorporates multiple revegetation techniques attuned to the varied site conditions, including live cuttings, willow wattles, fascines, as well as container stock. This site provides 6,000 linear feet of shaded riverine aquatic habitat, 12.95 acres of riparian habitat, and 0.75 acres of wetland habitat. The second site is within the Tennant Marsh on Coyote Creek. At that location 1.9 acres of giant reed (*Arundo donax*) will be removed, with a multi-year eradication/maintenance effort, and replanted with willow/cottonwood riparian habitat. Permits for the project are pending (2001) and implementation of the mitigation is scheduled for 2002.

*Client: Santa Clara Valley Transportation Authority*

### OTHER REPRESENTATIVE RESTORATION DESIGNS:

- WESTLAKE FARMS WETLAND HABITAT RESTORATION - *Kings County*  
*Client: Westlake Farms, Inc.*
  
- CONCORD NAVAL WEAPONS STATION MARSH RESTORATION - *Contra Costa County*  
*Client: U.S. Navy via PRC Environment Management Inc.*
  
- WARM SPRINGS WETLAND DELINEATION AND MARSH RESTORATION - *Alameda County*  
*Client: Thompson & Wright, Architect/Planner*
  
- HAMILTON ARMY AIRFIELD WETLAND RESTORATION PLAN - *Marin County*  
*Client: Woodward-Clyde Consultants, Inc.*
  
- PENN MINE RESTORATION PLANNING AND MONITORING  
*Client: CH2MHILL and East Bay Municipal Utilities District*