# COOLEY LANDING SALT POND RESTORATION PROJECT

January, 2001

**OVER 150 ACRES** of former salt marsh, known as the Cooley Landing Salt Pond, is being restored to native marsh land by Aventis CropScience USA Inc. (formerly Rhone-Poulenc Inc.) as part of its remediation program for the 1990 Bay Road Site in East Palo Alto. "We are pleased to sponsor this project," said Bob Ferguson, Remediation Manager for Aventis. "It will bring a significant environmental benefit that the public can see and enjoy. It's a real change of pace from most of the remediation work we do, which is below the ground surface."

According to Mark Johnson, Project Officer with the Regional Water Quality Control Board: "This is the most impressive habitat restoration project I have witnessed in my many years as a project manager for the Regional Board. Aventis and its consultants have done a superb job. This will be a huge benefit to the Bay and to the threatened and endangered species that rely on salt marsh habitat."

## RESTORATION PLAN

A **TEAM** of expert civil engineers, hydrologists, ecologists and biologists designed the restoration plan. The technical team studied old aerial photos that showed the locations of the original slough channels. Hydrodynamic studies were performed to determine how to direct tidal action into the historic sloughs and to maximize sedimentation potential at the marsh. Two cuts in the levee were designed to optimize tidal flushing and to restore the wetland as much to its natural, historic condition as possible.

The restoration plan was reviewed and approved by the Regional Water Quality Control Board and the Midpeninsula Regional Open Space District. Once the plan was approved, permits were obtained from the Bay Area Conservation and Development Commission and the Army Corps of Engineers, which involved additional review by State and federal resource agencies having oversight responsibility for threatened and endangered species.

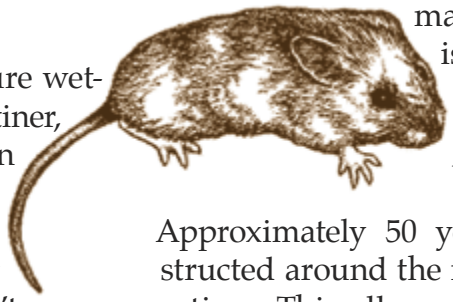
**Aerial Photo of Salt Pond**

In the fall of 2000, the salt pond was drained and "training berms" were constructed to encourage the circulation of tidal water through the historic slough channels. In December 2000, the levee was cut to connect the former salt pond to San Francisco Bay again. The levee was breached in two locations that correspond to the locations of the historical slough channels.

The newly restored sloughs will allow water from the Bay to flow in and out of the marsh with the tides. This tidal action will result in sedimentation, which will raise the level of the old pond bottom and provide a new opportunity for marsh plants to grow. It will also reduce the salinity of the compacted soils in the former salt pond, allowing seeds that have remained dormant there to sprout. This natural sedimentation process will eventu-

ally support lush marsh vegetation and wildlife habitat.

"This project is really a prototype for future wetlands restoration," according to Dr. Jeff Haltiner, the principal hydrologist who worked on the project. "On past wetlands restoration projects, large holes were punched into levees at random locations. The resulting sloughs end up too wide, and they don't provide a safe habitat for native animals." Because of the detailed advance research and planning at the Cooley Landing Salt Pond, the slough channels here will have steep embankments and many thin, meandering pathways that provide natural protection against predators.



Haltiner projects that the conversion of the former salt pond to natural salt marsh vegetation will occur over a period of 3 to 5 years. The site will continue to be monitored for at least 20 years.

Mike Rafferty, Aventis's consultant overseeing the restoration project agrees with Haltiner about the project's importance. "This project will dramatically increase the area of salt marsh habitat available to threatened and endangered species in the midpeninsula area, and it will serve as a model for the many salt pond conversion projects that hopefully will be happening in San Francisco Bay over the next few years. It also shows what can be achieved when a private company comes up with a great idea, and works in partnership with the local community and the resource agencies to realize it."

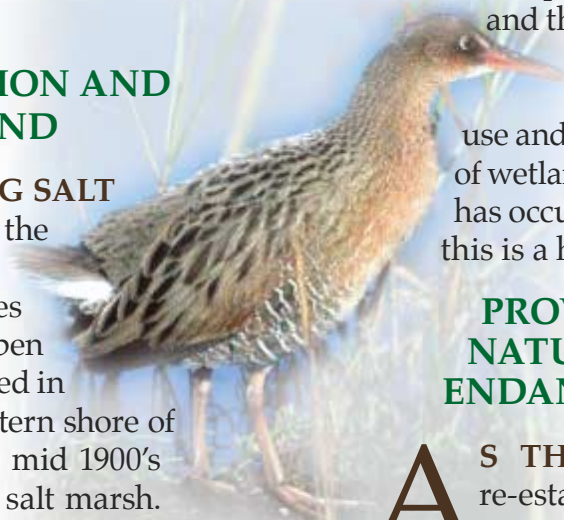
## SITE DESCRIPTION AND BACKGROUND

**THE COOLEY LANDING SALT POND** is owned by the Midpeninsula Regional Open Space District. It lies within the Ravenswood Open Space Preserve, which is located in Menlo Park, on the southwestern shore of San Francisco Bay. Until the mid 1900's this area was a natural tidal salt marsh. Tidal marshes serve as a transition zone between the aquatic habitats of the Bay and dry upland areas. They are one of nature's most productive ecosystems—providing habitat for birds, fish, mammals and a host of tiny organisms. Tidal marshes also filter storm runoff, preventing degradation of water quality in the Bay.

Approximately 50 years ago, a levee was constructed around the marsh to isolate it from tidal action. This allowed the site to be used for salt production. In 1983, salt production was discontinued, and the Midpeninsula Regional Open Space District purchased the site.

Aventis has been taking actions to address soil and groundwater contamination at the 1990 Bay Road Site (a former chemical manufacturing plant in nearby East Palo Alto) since the 1980s, under the oversight of the Regional Water Quality Control Board. Historic activities at the Bay Road plant affected soil and groundwater in the Ravenswood Industrial Park. Subsequent cleanup and containment work resulted in the degradation of approximately three acres of nontidal marsh. Rather than restore or replace a very small, isolated nontidal wetland within an urban industrial park, Rhone-Poulenc proposed restoring the huge salt pond to the north of the site.

"This is a real win-win situation," notes Mike Rugg, a biologist with the California Department of Fish and Game. "The parties found a relatively straightforward way to compensate for the past destruction of a small patch of wetland that was isolated, and thus less usable. The public and the critters now will have 150 acres of newly restored tidal marsh to use and enjoy. Given the tremendous loss of wetlands around San Francisco Bay that has occurred since the turn of the century, this is a huge benefit."



## PROVIDING A SAFE AND NATURAL HABITAT FOR ENDANGERED ANIMALS

**AS THE SLOUGH CHANNELS** are re-established and marsh vegetation returns, the restored marsh will provide a safe and natural habitat for many native plants and animals. Two such animals, the California Clapper Rail and the Salt Marsh Harvest Mouse,

live only in the salt marshes of the San Francisco Bay. Both are officially recognized as endangered species.

The California Clapper Rail is a shy, pheasant like bird that hides and nests along the sloughs of the salt marsh. Once abundant in the Bay Area, the population of Clapper Rails has dwindled to approximately 300 birds.

The Salt Marsh Harvest Mouse weighs less than a nickel and would fit easily in the palm of a hand. This animal is unique, in that it is so well adapted to the salty environment that it processes the salt water from the marsh plants it feeds on, eliminating the need to drink fresh water.

Dr. Ron Duke, a biologist who has studied the Salt Marsh Harvest Mouse for many years, provided expert input on how to restore the Cooley Landing Salt Pond site so that it would attract the mouse. He commented that "the Salt Marsh Harvest Mouse is severely threatened because over 80 percent of its original habitat has been destroyed." The tidal wetlands that remain around the Bay are fragmented. "Pieces of wetlands have been restored here and there, but there are virtually no big blocks of wetlands left," notes Duke. "That is why the Cooley Landing restoration project is so important. It opens up significant new acreage of the kind of wetlands these endangered species so desperately need if they are to thrive, rather than become extinct."

Both the Clapper Rail and the Salt Marsh Harvest Mouse each depend on only one plant for survival, making them even more vulnerable when their natural habitat is lost. The Clapper Rail makes its home in cordgrass, while the Salt Marsh Harvest Mouse depends on pickleweed for survival. Both of these plants are expected to grow in abundance when the Cooley Landing Salt Pond is restored to tidal marsh.

According to Duke, there are small, functional populations of these birds and mice in wetlands to the north and south of the site. This restoration project will provide an important link that will significantly increase their habitat, improving their chance of survival substantially.

## SALT MARSH PLANTS

**MOST PLANTS CAN'T GROW** in a tidal marsh, because the soil is too salty. Some plants, however, have developed ways to keep salt out of their roots and have adapted to being submerged by tidal waters for short periods of time. These plants grow in distinct zones depending on how long they can be submerged and survive. Among these are Cordgrass and Pickleweed—plants that are essential to the survival of the California Clapper Rail and the Salt Marsh Harvest Mouse, respectively.

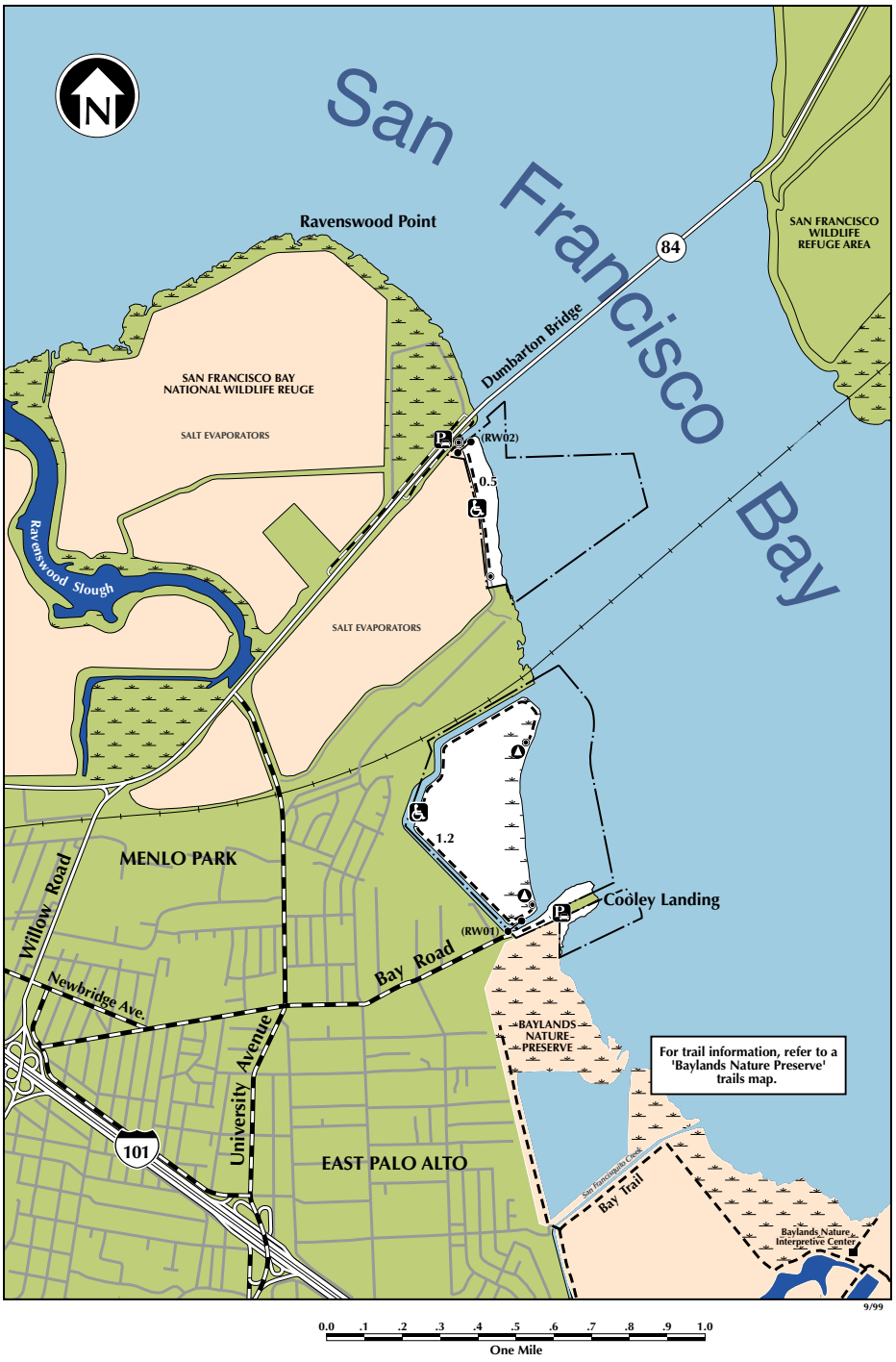

**CORDGRASS** is one of the most abundant plants in salt marshes. It grows in the boundary area between the bay waters and the mudflats and is able to be completely underwater for short periods of time. Cordgrass is the first link in many food chains. In the fall, cordgrass reaches 4 feet in height and resembles a small corn plant.


**PICKLEWEED** is the other dominant salt marsh plant. Pickleweed grows in the higher areas of the marsh that are too dry for cordgrass. Its compressed leaves look like a series of slender pickles attached end to end. Pickleweed is able to remove salt and store it in these "pickles" until fall, when the end pickles turns pink or red, dry up and break off.

**Natural marsh south of Cooley Landing**

# RAVENSWOOD OPEN SPACE PRESERVE

## MIDPENINSULA REGIONAL OPEN SPACE DISTRICT




**Trail Use**

Hiking, Bicycling

Note: No Dogs Allowed On Preserve

**Map Legend**

- Gate ( #s )
- 1.0 Trail Distance in Miles
- Preserve Boundary
- Parking Lot
- Whole Access Trail
- Point of Interest
- Other Public Lands
- Marsh
- No Public Entry (Private or Leased Lands)

## FOR MORE INFORMATION

*If you have questions or comments about the Cooley Landing Salt Pond restoration project, please call the Regional Water Quality Control Board's project manager, Mark Johnson, at (510) 622-2493. You may also call Mara Feeney, the local community relations representative for Aventis, at (650) 326-9222.*

*The Cooley Landing Salt Pond Restoration Project is funded by Aventis CropScience USA Inc. (formerly Rhone-Poulenc Inc.), the company responsible for the investigation and remediation of the 1990 Bay Road Site in East Palo Alto. Aventis's consultants and contractors for this project include:*

S.S. Papadopulos & Associates, San Francisco, California – Engineering & Project Management
Geomatrix Consultants, Oakland, California – Engineering Design
H. T. Harvey & Associates, Alviso, California – Endangered Species Consultant
Arcadis JSA, Long Beach, California – Wetland Ecologists
Philip Williams & Associates, San Rafael, California – Hydrologic Design
Cooper Crane & Rigging, Novato, California – Construction Contractor

# UPDATE ON COOLEY LANDING SALT POND RESTORATION PROJECT

**JUNE, 2002**

The Cooley Landing Salt Pond has been monitored almost continuously since it was re-connected to the tidal flow of San Francisco Bay in December, 2000. Monitoring results indicate that the wetland restoration process has exceeded expectations in many regards. The levee cuts and temporary "training berms" (as can be seen in the photograph below) have been successful in directing tidal flow back into the historic slough channels, allowing them to redevelop and distribute Bay sediments across the marsh plain.


"Personally, this is about the most rewarding project I have ever worked on," says Mark Johnson of the Regional Water Quality Control Board. "The re-establishment of 150 acres of historic tidal wetland is a huge benefit to the Bay, the endangered species like the Salt Marsh Harvest Mouse and the Clapper Rail, and to the community. This is something we will look back at 20 or 30 years from now and be proud of our accomplishment".

Monitoring has shown that there is good tidal circulation within the former salt pond. There is still some ponding on the marsh plain during low tides, but drainage is expected to continue to improve, as more channels develop within the marsh over time. Development of the marsh plain through sedimentation is progressing at a rate similar to that of other South Bay restoration sites. Monitoring has also shown that the re-vegetation of the site with native salt marsh plants is progressing well.

The initial goal for the first year of the project was to have 10 percent of the restoration area covered with native salt marsh vegetation. The project exceeded that goal. By the end of the first year, 17 percent of the site was covered with native salt marsh vegetation. In summary, the restoration project at the Cooley Landing site appears to be successfully creating the conditions necessary to support healthy marsh function and development.

In addition to the monitoring that has been done by the project team of engineers, hydrologists, ecologists and biologists, a group of Palo Alto high school students has also been studying tidal flows and sedimentation rates.

Monitoring data for the Cooley Landing site can be found in a document entitled, "Cooley Landing Salt Pond Restoration Baseline and Year 1 Monitoring Report." This report is available for public review in the public library located at 2415 University Avenue in East Palo Alto.

For further information about this restoration project, contact Mark Johnson, project manager for the Regional Water Quality Control Board, at (510) 622-2493, mej@rb2.swrcb.ca.gov or Mara Feeney, community relations representative for Aventis CropScience USA Inc., at (650) 326-9222, mara@marafeeney.com.