

Antioch Dunes National Wildlife Refuge

by Chris Bandy

Editor's Note: In March 2003, the National Wildlife Refuge System will be celebrating its 100th anniversary. This system is a unique network of lands and waters set aside specifically for the conservation of fish, wildlife and plants. President Theodore Roosevelt established the first refuge, 3-acre Pelican Island Bird Reservation in Florida's Indian River Lagoon, in 1903. Roosevelt went on to create 55 more refuges before he left office in 1909; today the refuge system encompasses more than 535 units spread over 94 million acres.

Leading up to 2003, the Tideline will feature each national wildlife refuge in the San Francisco Bay National Wildlife Refuge Complex. This complex is made up of seven Refuges (soon to be eight) located throughout the San Francisco Bay Area and headquartered at Don Edwards San Francisco Bay National Wildlife Refuge in Fremont. We hope these articles will enhance your appreciation of each refuge and the diversity of habitats and wildlife in the San Francisco Bay Area.



*Antioch Dunes Evening Primrose
Photo by Ivette Loredo*

“A week patch” was how a colleague referred to this small refuge at one of my first meetings when I came to work at the San Francisco Bay National Wildlife Refuge Complex. Since then I have learned it is so much more. Amongst the “weeds” were the last populations of naturally occurring Contra Costa wallflower and Antioch Dunes evening primrose, both listed as endangered species. Closer examination also revealed that the Antioch Dunes is home to the world population of the Lange’s metalmark butterfly. In an effort to protect these species from sure extinction, particularly the Lange’s metalmark butterfly, Antioch Dunes National Wildlife Refuge was

created in 1980. It became the first National Wildlife Refuge established to solely protect endangered plants and an insect. Since then, scientists have discovered other species endemic to this riverine dune ecosystem that are just as rare as the endangered species but have not been listed. Aside from rare and endangered species, Antioch Dunes NWR is one of the few natural areas left along the industrialized stretch of the San Joaquin River. A state biologist mentioned she always knew the location of the refuge from a boat on the river because it was the only place “where green came down to the river.”

This 55-acre refuge is adjacent to the City of Antioch in Contra Costa County and is comprised of two units, the 14-acre Sardis Unit and the 41-acre Stamm Unit. The Sardis Unit is bordered on each side by six-acre Pacific Gas & Electric (PG&E) land which also support the three endangered species mentioned above. The Fish &



Sardis Unit with San Joaquin River in the background

Wildlife Service and PG&E have long been partners working toward a common objective of enhancing the lands for the two flowers and the butterfly. Plans are currently underway to strengthen that partnership which is vital to the survival of these species.

Due to the sensitivity of the habitat, Antioch Dunes NWR has been closed to the public since 1986. When the refuge was open, frequent fires occurred, wiping out entire stands of endangered plants. In addition, endangered plants were trampled when Humphrey the humpback whale swam up the San Joaquin River in 1986, and created a viewing frenzy from the riverbanks. To protect the plants from further damage, the refuge closed. Even now, fires started by trespassers have continued to be a problem and the largest fire, burning virtually half of the Stamm Unit, occurred in July. Recognizing that fires is one of the major threats to these species, a program to build firebreaks throughout the refuge in order to prevent large fires is now underway.

Although the refuge is currently closed to the public to protect the Contra Costa wallflower, Antioch Dunes evening primrose, and Lange's metalmark butterfly, limited public use is planned for the future. Firebreaks created to prevent large fires can be used as trails for guided tours, and in honor of the Centennial Celebration, will offer the public opportunities to view spring wildflowers and endangered species during optimum wildlife viewing times. The times the refuge is open will coincide with the blooming of spring flowers and optimum endangered species viewing, and are planned to continue beyond the National Wildlife Refuge System's 100th Birthday. The refuge's vision is to eventually have trained docents who lead tours on a regular basis.



Lange's metalmark butterfly
Photo by Bob Long

There is still much to be done on the refuge. To assist endangered and other native plants to become self-sustaining, the refuge actively grows the necessary plants at the San Francisco Bay National Wildlife Refuge Complex headquarter's greenhouse to be planted on the refuge. Aggressive non-native plants with no natural predators are controlled either by hand pulling, by prescribed burning, or by applying herbicides. Dune ecosystems rely on blowing sand to keep its integrity. Because of the surrounding industrialization that blocks sand movement, the refuge has imported sand to create new dunes. Sand mining in the Sardis Unit before it had become a wildlife refuge had also drastically lowered the ground level, making it easier for riparian plants to invade the area because it is easier for their roots to access water.

As mentioned earlier, fires are a problem on the refuge. Coyote brush must be removed from areas previously planted with naked-stemmed buckwheat (food plant for the Lange's metalmark butterfly) to stimulate buckwheat growth and reduce the fire



*Contra Costa Wallflower
Photo by Rachel Hurt*

severity hazard. Methods will be designed and implemented with nearby gypsum factories to stop gypsum dust from blowing onto plants and stunting their growth. The refuge is also looking to acquire additional parcels of land containing the wallflower, primrose and butterfly adjacent to PG&E property. Much research contributing to the management of this remnant riverine dune ecosystem has occurred, but more research is needed to determine fire effects on certain species and improving methods for controlling invasive grasses. The small size of the refuge and its fragmented habitats contribute to the invasion of exotic weeds.

To assist managers of Antioch Dunes NWR to stay focused on management goals and objectives, a Comprehensive Conservation Plan (CCP) was completed in August. The CCP is a fifteen year management plan which all refuges throughout the country will be completing in the next decade. Public review of the CCP, at various stages of completion and as a final document has generated a flurry of expressed interest in the refuge. More volunteers for management activities such as planting and weeding have come forth and potential partners have contacted us. Recent articles in the media concerning the CCP have also brought more public interest. The more aware the public is about the refuge and how it relates to the ecosystem as a whole, the better the survival chances of these endangered species.

The refuge requires constant attention and probably always will. The long-term goal is to have self sustaining endangered species and other native populations while minimizing exotic populations and to have controlled use enjoyed by the public with minimal negative impacts. With the continued support of scientific researchers, management partners, willing volunteers and dedicated staff the species and ecosystem that Antioch Dunes NWR was established to protect will be thriving during the Bicentennial Celebration of the National Wildlife Refuge System.

Chris Bandy is the manager of the Antioch Dunes National Wildlife Refuge. He worked for the U.S. Forest Service and in natural resources management for the Department of Defense before coming here.