

Tideline



Don Edwards / Antioch Dunes / Ellicott Slough / Farallon Island / Marin Islands / Salinas River / San Pablo Bay

The Bird's Beak of LaRiviere Marsh: a Rare Plant Story

By Brian Alfaro

Alas! How little does the memory of these human inhabitants enhance the beauty of the landscape! Again, perhaps, Nature will try, with me for a first settler, and my house raised last spring to be the oldest in the hamlet.

—Henry David Thoreau, *Walden*

At Walden Pond, Thoreau reflected that seldom do our human establishments and activities enhance beauty on natural landscapes. The primary effect of human encroachment on the natural environment is habitat loss, which diminishes not just a scenic view, but also an ecosystem's living and non-living components. In the past few decades, however, we humans realized the value of conserving and restoring natural landscapes. Salt marshes—the dominant landscape of the Don Edwards San Francisco Bay National Wildlife Refuge (the Refuge)—have undergone several human-caused transformations. Some of the most recent transformations, however, were designed to convert a few barren areas into productive ecosystems. In one small parcel of these restored habitats, a rare plant has once again settled in its home at the salt marsh.

In July 2010, the newly-formed Weed Mapping Team of the Refuge was walking the edges of LaRiviere Marsh to find exotic plants. The team, composed of Meg Marriott, the Weed Management Specialist, and yours truly, found a rare botanical gem—the Point Reyes bird's beak



Point Reyes Bird's Beak

Photo by John Bradley/USFWS

(*Cordylanthus maritimus* ssp. *palustris*), a subspecies of the saltmarsh bird's beak (*C. maritimus* ssp. *maritimus*).

The Discovery

On one July afternoon, our team established a survey line on a section of LaRiviere Marsh. As we walked along the perimeter, Meg remarked on the robust character of the native vegetation between upland and marsh habitats of our survey area. On the

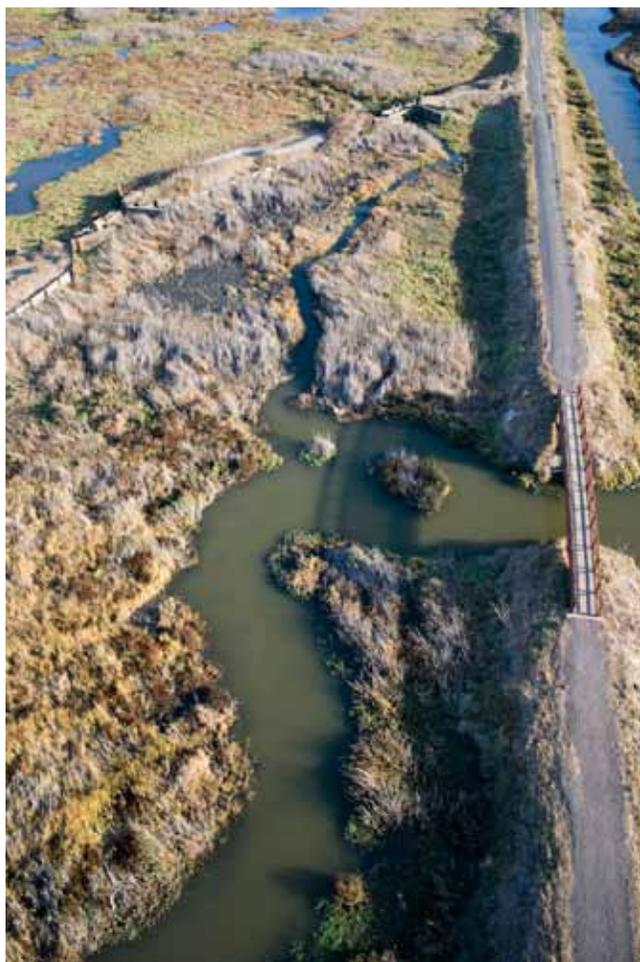
upland side were thick mats of creeping wild rye (*Leymus triticoides*). On the salt marsh, salt grass (*Distichilis spicata*) sprouted amongst the deep green pickleweed (*Salicornia virginica*). The jagged phalanx of invasive cordgrass (*Spartina* spp.) and black mustard (*Brassica nigra*) clashed with the lower-lying native vegetation. Viewed from afar, the yellow and purple stippling of alkali heath (*Frankenia salina*), jaumea (*Jaumea carnosa*), sea lavender (*Limonium californicum*), and early gum plant flowers (*Grindelia robusta*) could have inspired Van Gogh. This intermediate area, also called an ecotone, is vital habitat for many plant and animal residents of the salt marsh.

As we trudged through the mud and onto higher ground to move away from the marsh, we saw a conspicuous, peculiar patch of purple plants that resembled Indian paintbrushes (*Castilleja* spp.). We scrambled to the patch to identify it, but to no avail. After collecting specimens and closely inspecting the patch, we scanned the area and found more patches. We walked back to the headquarters with our mystery plant. That weekend, with the help of John Bradley, the San Francisco Bay National Wildlife Refuge Complex's Deputy Manager, we determined that the mystery plant is a rare subspecies of the endangered saltmarsh bird's beak.

continued next page

Natural History

Despite its common name, Point Reyes bird's beak also occurs outside of Point Reyes National Seashore (Marin County, California). According to the California Natural Diversity Database (California Department of Fish and Game), 50



Aerial view of LaRiviere Marsh. Photo by Cris Benton

localities are presumed extant. The current statuses of these populations are unknown because they have not been monitored since the early 1980s. There is insufficient data to classify Point Reyes bird's beak as endangered even though its total population has declined.

Point Reyes bird's beak reproduces by seed. In order for the seeds to germinate, the soil must have reduced salinity, which is achieved by way of abundant winter rains. The seedlings begin to emerge in early springtime from February until May. Although nocturnal animals such as insects and small mammals are known to visit Point Reyes bird's beak, the plant

is known to self-pollinate. Its blooming period begins in June and lasts until mid-September. Seeds are dispersed by changing tides, but are not carried to long distances away from their patches.

Formerly in the figwort family (*Scrophulariaceae*), bird's beaks (*Cordylanthus*) are annual plants recently classified in the broom rape family (*Orobanchaceae*) together with its close relatives, the paintbrushes of the genus *Castilleja*. The saltmarsh bird's beak (*C. maritimus*) has two subspecies: the saltmarsh bird's beak (ssp. *maritimus*) and the Point Reyes bird's beak (ssp. *palustris*). Bird's beaks stand erect from four to 15 inches with few-branched stems having few leaves. Some species, including the saltmarsh bird's beaks, have velvet-like stems covered with white hair-like structures. Like most plants in the marshes, its foliage secretes fine granules of salt. The stems of Point Reyes bird's beak are dark purple, with its lower branches extending upward to the tip of each stem forming a pattern similar to a chandelier. It has a club-shaped inflorescence with white flowers having purple or yellow tips that resemble bristles of an artist's filbert brush lightly dabbled on a

palette of oil paint.

Its most remarkable feature, however, is just below the surface of the marsh. Roots of bird's beak form appendages called haustoria that can attach to roots of other species. Haustoria serve as conduits for "stealing" food and water from other plants. These attachments may form extensive networks of host plants—there was a feast below the ground that we stood on—allowing them to outlast other annuals. While most annuals in hot and dry regions have completed their life cycles by early summer, bird's beaks can thrive in the mid-summer heat due to extra nourishment from hosts. In contrast to the pale orange-colored dodder (*Cuscuta* spp.),

which is an absolute parasite that frequently covers marsh plants, bird's beaks are not completely parasitic, as they produce food through sunlight like most plants. Plants and other organisms that subsist on other resources beside their hosts are called hemiparasites (partial parasites). A well-known hemiparasite is the mistletoe (*Phoradendron villosum*), which attaches to oaks (*Quercus* spp.) and other trees. Botanists speculate that partial parasitic strategy allowed bird's beak and related genera to survive and expand throughout western North America.

Bird's beaks have adapted to different host plants from distinct communities. For example, the saltmarsh bird's beak is known to associate with salt grass, pickleweed, and sea lavender. The hairy bird's beak (*C. pilosus*), an upland species found in woodland and savannahs, strictly attaches to roots of oaks. Although undocumented, the Point Reyes bird's beak apparently thrives on native salt marsh vegetation, as we have observed in LaRiviere Marsh. Unfortunately, as these habitats dwindle, so do the populations of host plants and their associated bird's beak.

Habitat Restoration and Conservation

Most bird's beak species are candidates for the federal endangered species list. Without a doubt, population decline results from habitat degradation due to human-related disturbance. Salt marshes throughout the world, such as those in Venice, Amsterdam, and Tokyo, have been damaged by development. Although the salt marshes of San Francisco Bay have been impaired by intensive human activity such as construction of impermeable surfaces and levees, the restoration of these marshes has been met with much success. LaRiviere Marsh, one of the early restoration sites of the Refuge, is an example of a once degraded salt marsh habitat that has been restored and appears to be well on its way to recovery.

The area south of Coyote Hills was once part of the vast salt marsh habitat of San Francisco Bay, but was converted into salt ponds with the construction of levees, thereby obstructing tidal flow. A parcel encompassed by this converted area, now called LaRiviere Marsh, was restored through a concerted effort by concerned citizens, organizations, and agencies, including Refuge staff. By restoring a tidal

regime, the marshland vegetation returned. Currently, LaRiviere Marsh is comprised of saltmarsh, upland, and ecotone habitats, which contain diverse vegetation that serve as hosts for the rare Point Reyes bird's beak.

It is encouraging for naturalists and native plant enthusiasts to know that these declining rare plants are given a new chance to establish in these restored landscapes. The emergence of the Point Reyes bird's beak at LaRiviere Marsh is noteworthy given the specificity of hemiparasites for host plants. June Smith, the volunteer manager and botanist of the Refuge Complex's Native Plant Nursery states that "...finding a rare plant in a restored marsh means the restoration worked. It's a great success story. [Many] things had to go right to get the [Point Reyes bird's beak] to grow there and in 2010, all those things went right." Not only does the LaRiviere Marsh provides viable habitat for endangered animals, such as the California Clapper Rail (*Rallus longirostris obsoletus*) and Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*), but it now sustains a rare plant species as well.

To repeat Henry David Thoreau's musing at Walden Pond, nature has tried again with a new "settler," in place of humans, at the LaRiviere Marsh. The Point



Point Reyes Bird's Beak. Photo by John Bradley/USFWS

Reyes bird's beak, along with other rare and endangered inhabitants, has found a new home. This time, however, instead of destroying a landscape, we restored a place amidst our establishments that will remind us of the splendor of nature.

Brian Alfaro is a biologist hired through the Student Temporary Employment Program

with funding from the American Recovery and Reinvestment Act for Summer - Fall of 2010. He has a Bachelor of Science in Ecology, Behavior and Evolution from the University of California at Los Angeles, and is currently in the graduate program in the Department of Geography and Environmental Studies at the California State University, East Bay.

Refuge benefits from the diversity of its staff

I was recently asked to speak to the advanced refuge manager training academy at the U.S. Fish and Wildlife Service's National Conservation Training Center located just outside Shepardstown, West Virginia. Field managers, like myself, are often asked to lead discussions on specific topics, usually because of some particular expertise or perspective. I wondered initially why I was being asked to speak on the topic of leading a diverse, interdisciplinary workforce. I quickly realized that our large and diverse staff at the San Francisco Bay National Wildlife Refuge Complex, particularly in terms of ethnic origin, gender and professional training, was the primary reason. As I gathered my thoughts on the subject, I looked back at the staff photo from Merritt Island National Wildlife Refuge, a large refuge in Florida, where I worked in 1985 and counted a staff of 12 men and 2 women, all white. Both the women worked in the office. I came to appreciate that I might indeed have something to offer the

class – especially because in my 26 year career with this agency, I can reflect back on the changing workforce. And while we have a long way to go before our overall agency workforce truly reflects the diversity of the country as a whole, we have made progress. Our workforce in the Bay Area reflects

connect with our local diverse communities, providing a variety of viewpoints for better decision making, improving our organizational culture and morale, increasing creativity, and possibly leading toward higher retention of employees. I believe our agency is striving for a more diverse



Refuge Reflections

by Mendel Stewart

positively on those changes.

At this Refuge Complex, we have a staff of 41, 20 of them are women, reflecting a rather broad diversity of both ethnic and professional disciplines. This diversity has a variety of benefits, such as helping us

workforce and what we have here in the Bay Area may be a good reflection of the effort to diversify. Hopefully, my discussion with the training academy inspires managers to continue to strive toward more diversity at their National Wildlife Refuges just as we are doing here.

Salt Pond Restoration Project Update: Enhanced Habitat and New Trails in 2010 offer Opportunities for Wildlife, People

by *Melisa Helton, Wildlife Refuge Specialist*

The largest tidal wetland restoration project on the West Coast is happening right here in the San Francisco Bay Area, and the majority of it is taking place on the Don Edwards San Francisco Bay National Wildlife Refuge. After years of developing a management plan that encompasses the goals of restoring and enhancing wildlife habitat, providing wildlife-oriented recreation, and improving flood management in the South Bay, several projects are now underway in 2010.



Senator Dianne Feinstein speaks at the trail opening of Pond SF2. USFWS Photo

Ravenswood Complex: Pond SF2 Construction

Pond SF2 in the Ravenswood pond complex just west of the Dumbarton Bridge in Menlo Park has undergone a dramatic transformation this summer. What was once a dry, largely barren pond for many years has now been developed into managed pond habitat with islands created for feeding shorebirds and ducks and nesting shorebirds. Several species of birds have already been sighted in the pond this fall. A new trail was constructed linking into the Bay Trail system, which officially opened during a ribbon cutting with U.S. Senator Dianne Feinstein on the morning of September 7, 2010. Take the time to walk the short trail to one of two new viewing platforms at the site.

Alviso Complex: Pond A8

There are also several projects in the

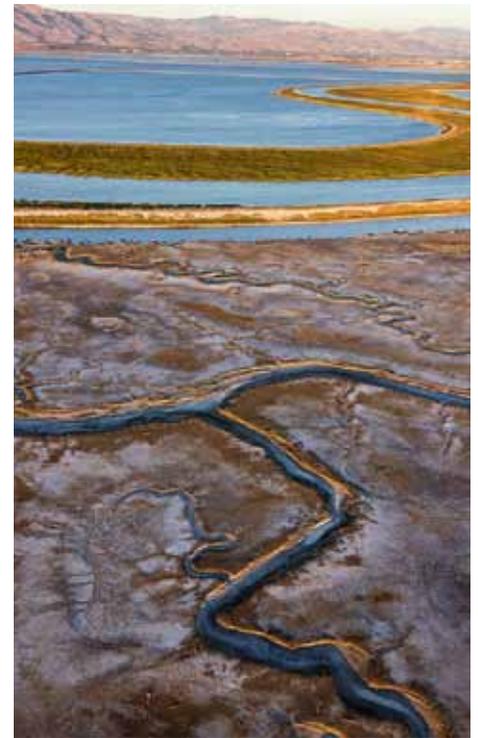
Alviso Pond Complex which have been completed this year or are currently under way. A 40-foot notch at the southern end of Pond A8 was completed this summer that will connect 1,400 acres of ponds to the Bay, creating new marsh and shallow water habitats for pelicans, cormorants and ducks. Water will be introduced in the spring 2011. A critical part of the restoration work at Pond A8 involves monitoring for mercury. The notch is designed so that the ponds can be separated again from the Bay should mercury become a problem. Construction was managed by the Santa Clara Valley Water District, which helped to fund the project, along with state funding and some federal stimulus money from National Oceanic and Atmospheric Administration.

Alviso Complex: Pond A6

Pond A6 restoration will create approximately 330 acres of tidal salt marsh and tidal channel habitat that will evolve over time by breaching and lowering the outboard levee. Over time, tidal channel and vegetated salt marsh habitats are expected to develop as tidal channels reform and as sediment accumulates and vegetation establishes. Construction began in October 2010 and the levee will be breached in November 2010.

Alviso Complex: Bay Trail Segment Opening

After a long delay due to issues with the



Pond A6. Photo by Cris Benton

land transfer, a new 2.2-mile trail connecting the Shoreline at Mountain View and the City of Sunnyvale opened on September 20, 2010. Congresswoman Anna Eshoo, partnering agency representatives and members of the Bay Trail were present to celebrate the event.

For more information, visit the project's website: www.southbayrestoration.org



Making Their Mark on the Marsh

Eight youths from a San Francisco Bay community spent their summer creating habitat for endangered marshland species

*By Anna Peschel,
Youth Conservation Corps Crew Leader*

This summer eight high school students from East Palo Alto were hired to work in the United States Youth Conservation Corps (YCC) program at the Don Edwards San Francisco Bay National Wildlife Refuge. The YCC program was created in 1970 to introduce youths to natural resource management. Through this program, teens learn how their work on federal lands benefits the site and the overall environment, and they also learn to appreciate and understand the ecosystems and the community. The crew from East Palo Alto had no prior exposure to natural resource conservation. They all lived within five miles of the work site, but prior to the program they did not know there was a National Wildlife Refuge in their community.

The work plan for the summer was ambitious. They were asked to create upland habitat on a levee of the Don Edwards Refuge located in East Palo Alto by removing nonnative vegetation, implementing environmentally sustainable weed control methods, and growing native plants. Every day the crew showed up at 7 a.m. and engaged in demanding, physical work. They were challenged to work as a team, to act professionally, to problem-solve, and to think innovatively.

Over eight weeks the crew met their goals and accomplished so much more. Invasive vegetation was removed from the levee and solarization tents were constructed to contain the weeds. They learned how to propagate native plants from seed and transplanted 2,800 of the seedlings. They also constructed a salinization irrigation system with a pump powered by a bicycle. Nonnative plants are not as tolerant of salt water as native plants, so irrigating the levee with bay water discouraged the weeds from growing. Through all of the work the crew accomplished they learned the value of the



The 2010 YCC crew sitting on a bench they constructed.

natural environment.

The crew's recognition of the importance of their work was evident from their thoughts. At the end of every day they reflected upon their new experiences in their journals. One of the crew members, age 17, stated in her journal:

This restoration project has helped me open my eyes and see the wonders the world has. It has taught me a lot that I didn't know. Everything was interesting starting from the weed whackers to transplanting.

The projects were designed to teach the crew members about bayland habitats, watersheds, tides, and the importance of conservation and habitat for wildlife. However, the program was not all work and no play. The crew took numerous field trips that provided them with the opportunity to see more natural spaces in their community. They kayaked in the slough while studying tides, bicycled around the bay looking at different habitats, and built solar ovens to learn about renewable energy. They also attended the California Academy of Sciences in San Francisco to learn about biodiversity and conservation in a global

context. The greatest accomplishment of this year's program was that it connected a segment of the East Palo Alto community to nature and encouraged the crew to start thinking as stewards of the environment. The crew's experience on the refuge was an awakening for many of them. They gained a whole new perspective and appreciation for nature and the work it takes to protect and restore it. Their newfound knowledge is already spreading into the community as they shared their summer job experience. At the end-of-the-season barbecue the crew made presentations to their families and to the community about what they learned and accomplished. At the end of the day, the crew and their families walked away with proud smiling faces knowing that their efforts had a positive impact on their community.

This has been a rewarding experience - connecting people in an urban landscape to the natural spaces around them. Inspiring people to become stewards of natural spaces helps to conserve habitat for existing ecological communities and for future generations.

*Compiled by Mieke Griffin,
Visitor Services Intern*

The year 2010 has yet again been a busy one for the San Francisco Bay National Wildlife Refuge Complex. Here are just a few highlights of some of the refuges' accomplishments.

Antioch Dunes National Wildlife Refuge

With all the heavy rains that occurred this past spring, the endangered plants at Antioch Dunes have had a very good year. The number of Contra Costa wallflowers more than doubled and the Antioch Dunes evening primrose numbers increased as well. However, the invasive plants also had a good year with some plants growing well over our heads. There's been heightened management activity to combat these invaders. Due to a late summer this year, Lange's metalmark butterfly surveys were extended into October.



Contra Costa Wallflower

Don Edwards San Francisco Bay National Wildlife Refuge

It has been an exciting year for the restoration projects at Don Edwards San Francisco Bay National Wildlife Refuge. Levees at ponds SF2, A6, and A8 have all been breached and we are excited to see



Pond SF2. Photo by Cris Benton

what happens over the next several years. These restoration efforts attracted much attention to the refuge as local and state officials, such as U.S. Senator Dianne Feinstein and the State of California's Resource Secretary Lester Snow, attended the trail opening of Pond SF2 and rallied support for the projects.

All these restoration efforts require monitoring by our biologists. At Pond SF2, biologists are monitoring bird use of the 30 islands that were constructed in the pond and studying whether increased public access to the pond will negatively affect the wildlife. The focus is on mercury contamination at Pond A8, where a large research project is checking the mercury levels in soil, water, birds, and fish. At Pond A6 studies are focused on the impact of the large number of California Gulls that nest in the

area, and on the rate of sedimentation of the pond. A science symposium discussing these topics and more will take place on February 3, 2011. For more information please visit www.southbayrestoration.org.

As a part of the Weed Management Plan, an Invasive Plant Inventory and Monitoring program began this year. The inventory will be completed by early 2011.

Ellicott Slough National Wildlife Refuge

Many good things are happening at the Ellicott Slough NWR. This fall we completed our Comprehensive Conservation Plan (CCP), a management plan to guide the refuge over the next 15 years. We developed a vision statement, goals, objectives and strategies to direct future management. Goals include topics such as threatened and endangered species, migratory birds, restoration, invasive species, landscape level management, climate change, and future public access at Harkins Slough Unit. For complete details, please check on-line at www.fws.gov.

Groundbreaking has begun for the installation of a new office at the Buena Vista Unit at Ellicott Slough NWR. This satellite office will house personnel from two USFWS offices (San Francisco Bay NWR Complex and Ventura Fish and Wildlife Office) and personnel from California Department of Fish and Game. Ellicott Slough refuge staff is thrilled to be stationed on-site. In addition, staff can begin to create more partnerships with the local community.

This was the first year in four years that all three Santa Cruz long-toed salamander breeding ponds on the refuge held sufficient water for salamander recruitment. Plant, bird and amphibian surveys have continued. A new study on the refuge using hydrogeomorphic methodology (HGM) began in Fall 2010. This study using HGM, headed by the Pacific Southwest Regional Office, reviews the historic and current physical and biotic landscapes and processes such as vegetation, temperature, soils, etc. to evaluate how restoration and management of the land can best be achieved. In addition to

surveys, the California Conservation Corps and Renaissance High School students continue to be involved in restoration and education at the refuge.

Farallon National Wildlife Refuge

The Farallon NWR hosts the largest seabird breeding colony in the contiguous U.S., with about 350,000 birds of 13 species. Our partners, PRBO Conservation Science, have been monitoring seabird productivity on the islands for nearly 40 years. The 2010 seabird breeding season was very productive for most species. Cassin's Auklets had one of their best seasons ever due to the abundance of planktonic krill, an important food source for chicks. However, Brandt's Cormorants, which have declined dramatically in the last few years, bred in low numbers with low productivity.

The East Landing crane, the lifeline to access the island, was replaced in March 2010. The California Air National Guard's 129th Rescue Wing provided critical air support transporting the crane to the island.

This was our second year in a cooperative effort with California Academy of Sciences and PRBO Conservation Science to host a live webcam from Southeast Farallon Island. The remote-controlled camera is placed on the top of the lighthouse where it provides 360 degree views. The camera can be accessed from the refuge



East Landing crane on Southeast Farallon Island

home page at
www.fws.gov/sfbayrefuges/Farallon

In September, the California Academy of Sciences in San Francisco's Golden Gate Park opened an exhibit on the Farallon Islands in collaboration with the refuge and PRBO Conservation Science. The exhibit includes an interactive aerial photograph, videos and audio clips with information on the natural resources, history and science of the islands. For more information, visit the Academy's website at www.calacademy.org

Salinas River National Wildlife Refuge

The Salinas River NWR, as well as the majority of the Monterey Bay, had a very successful Snowy Plover season in 2010. Late spring rains meant protective fencing

went up late, however the Federally-listed threatened birds did not delay nesting. Over 270 Snowy Plovers fledged. The Caspian Terns had their first successful breeding season since 2005. While only 300 adults were observed, the colony produced at least 166 fledglings. Also successfully completed was a new survey for the Federally threatened Monterey spineflower.

The refuge was granted funding from the American Recovery and Reinvestment Act (Stimulus Act) for a new fence located along our boundary and adjacent farmlands. This new and improved fence will help keep our native mule deer wild and our neighbors producing high quality produce.

Waterfowl hunting began October 23, 2010 and will end on January 30, 2011. During this time, a portion of the River Loop Trail will be closed to non-hunters for safety. There continue to remain WWII practice ammunitions on the beach and in the dunes near the derelict barge. Please do not attempt to touch or remove these practice rounds.

Snowy Plover Chicks. Photo by Jenny Erbes



Thank you San Francisco Bay Wildlife Society Donors!

We gratefully acknowledge the following donors who have made gifts to the San Francisco Bay Wildlife Society between July 1, 2010 and September 30, 2010. These gifts will be used for publishing Tideline, capital, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.

Sponsor

Helen E Conway and Bob Goulart

Participant

Kim Brink, Jane Hicks, Jeannette D Jensen, Martha A Johnson, and Douglas G Sprague

Supporter

Wilfred Baer, Bay Area Night Photography Group, Kirsten Holmquist, Edward Mitchell, Terry Smith, and United Airlines

Family

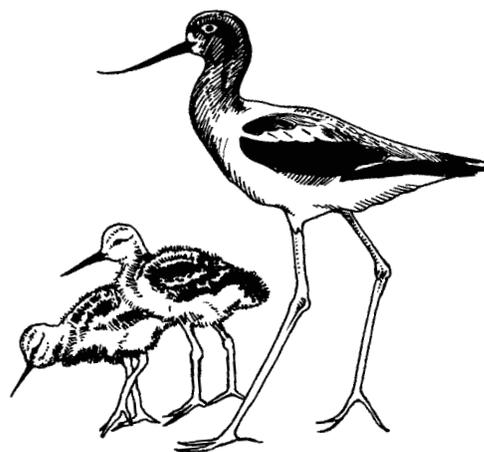
Lavonne M Coleman , PL & Helen E Fan, Melanie Ito, John B & Laura Jamieson, David Loeb, John Lukas, Charles T Moore, Sally & Ken Smyth, and Molly Sullivan

Individual

Sandra H Cooperman, Thomas & Cathy Crumpton, Loring G Dales, Eleanor S Hansen, Kenneth Himes, Sylvia Mc Laughlin, Karen Natoli Maxwell, Marianne Schonfisch, Shirley Mae Skaredoff, Sheila Sousa, Haven Thompson, Tri-City Ecology Center, William G Vandenburg, Marge E Wood, and Carol Szymanski

Senior/Student

Ema B Coker, Sharon Culp, Donna Droogas, Enid Jeff, Greg Kolar, Eugene I Majerowicz, James G Miguelgorry, Nancy Milligan, Julia A Paccioretti, Sue Rummer, Samuel D Sparck, Mary Elizabeth Stone, Kathryn Strachota, Vicente S Tenorid, and Stella Yang



Help Us Help the Refuge

Mail your donation to: San Francisco Bay Wildlife Society, P.O. Box 234, Newark, CA 94560. You may also fax your membership donation using a Visa or MasterCard number to (510) 792-5828.

For a gift membership, call 510-745-8170.

San Francisco Bay Wildlife Society is a nonprofit 501(c)(3) organization which raises money and awareness for the San Francisco Bay National Wildlife Refuge Complex.

YES! I want to support San Francisco Bay Wildlife Society and its programs with my membership. My dues include a subscription to *Tideline* and 15% discount at the Don Edwards SF Bay National Wildlife Refuge bookstore. Enclosed is my contribution of:

- \$20 Student/Senior \$50 Family \$100 Participant \$200 Corporation \$500 Sustainer
- \$35 Individual \$75 Supporter \$250 Sponsor \$1,000 Leader

Check Visa or MasterCard # _____ Exp. Date _____

Signature _____

Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ **Thank you for your support!**

Farallon Exhibit Opens at California Academy of Sciences

by Kimby Wells,

Environmental Education Specialist

The Farallon Islands and surrounding ocean harbor an incredibly diverse array of wildlife. The new exhibit at the California Academy of Sciences in San Francisco's Golden Gate Park showcases many of the unique and interesting species that rely on the Farallon National Wildlife Refuge for their survival. At the Cal Academy exhibit, visitors can actually "stand" on the islands and use a viewing scope to scan the landscape from the vantage point of the light house. The atmosphere of the islands is further captured by a flock of gulls soaring overhead, but at Cal Academy, visitors don't have to worry about droppings landing on their heads.

Designers at Cal Academy worked closely with refuge staff, our partners at PRBO Conservation Science, and other experts to develop the well-researched exhibit that also includes an audio-tour of the refuge and an interactive video screen with narrated footage from the islands and surrounding waters. In addition to wildlife,

the exhibit showcases the geology of the islands, the human history, impacts and indications of climate change, and conservation efforts.

In the exhibit, the Farallon Islands are described as "California's Galapagos" because of the rich biodiversity. Complimentary exhibits about marine conservation, the impacts of our every-day choices on the natural environment, and local wetland restoration projects flank the Farallon exhibit, while exhibits on climate change and the real Galapagos Islands sit opposite it on the main floor. Downstairs in the Steinhart Aquarium, visitors can learn more about the waters around the islands and view the new film titled *Sanctuary in the Sea: A Gulf of*



the Farallones Experience.

For a glimpse of the Farallon Islands, the California Academy of Sciences also provides a webcam: www.calacademy.org/webcams

More information about the Farallon National Wildlife Refuge can be found at www.fws.gov/sfbayrefuges/Farallon

CCP Watch: Status of Comprehensive Conservation Plans (CCP) around the SF Bay NWR Complex

What is a CCP?

A comprehensive conservation plan is a guide that uses the best available scientific knowledge to help managers achieve the purposes for which each refuge was established. The National Wildlife Refuge System Improvement Act of 1997 defined the mission for the Refuge System and requires refuges to have a CCP in place by 2012. The Act provides the U.S. Fish and Wildlife Service (Service) with guidance for managing refuges in a way that ensures the long-term conservation of fish, wildlife, plants and their habitats. CCPs outline goals, objectives and management strategies for a refuge to achieve during the 15-year life of a CCP.

San Pablo Bay NWR

A draft CCP was available for public review from July 12-August 11, 2010. Alternative C was selected as the preferred alternative which expands both wildlife management activities and visitor opportunities. This alternative identifies specific

actions that include developing an inventory and monitoring program; developing wildlife population goals; expanding tidal restoration and enhancement activities; assessing climate change impacts on refuge resources; providing considerable additions for visitor access; and substantially expanding environmental education and interpretation opportunities. Several comments were received and the CCP is being revised accordingly. The CCP is nearing final completion and is expected to be finalized towards the end of the year. The draft CCP can still be viewed at <http://www.fws.gov/cno/refuges/SanPablo/SanPablo.cfm>.

Ellicott Slough NWR

The CCP was finalized at the end of September 2010. Alternative B was selected as the proposed action which would emphasize wildlife management and provide more visitor services and environmental education opportunities. This alternative identifies specific actions including standardizing wildlife monitoring; improving wildlife

habitat; developing weed management and prevention plans; assessing contaminants and disease; plan and design of additional breeding ponds; climate change modeling; developing habitat, mosquito, and water management plans; developing a visitor services plan; and expanding environmental education. Copies will be available at <http://www.fws.gov/cno/refuges/ellicott>.

Don Edwards San Francisco Bay NWR

Goals have been developed that focus on endangered and threatened species; habitat management; visitor opportunities; environmental education and interpretation; and volunteer support. Work continues on developing objectives for the CCP. Alternatives are expected to be available for review at the end of 2010.

For more information about the above CCPs, or to receive hard copies of the documents mentioned above, contact Winnie Chan at 510-792-0222 x145.

Winter Activity Schedule

December

Saturday, December 4

*Beginning Birding Clinic

Environmental Education Center, Alviso

9:00 a.m. – 11:30 a.m.

If you can't tell your egrets from your cormorants this class is for you! We'll learn about binoculars, identification books, and other birding basics through hands-on activities and conversation. Then we'll go into the field to practice our new skills. Binoculars and books provided during the class. Be prepared to be outdoors in the weather for about an hour. Reservations Required. 408-262-5513 ext.106.

Sunday, December 5

Nature Drawing for Kids

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside so dress warmly. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363.

Saturday, December 11

Bird Photography Hike

Ravenswood Unit (SF2), Menlo Park

8:30 a.m. – 11:30 a.m.

Explore through your camera the newly restored wetlands in our Ravenswood Unit. Docent Alex Baranda will lead you on a hike to several locations to photograph shorebirds and waterfowl. Reservations Required. Call 408-262-5513 ext. 106.

Wetlands Restoration: The 50-year Journey

Environmental Education Center, Alviso

1:00 p.m. – 2:00 p.m.

Follow the progress of the largest wetlands restoration project on the West Coast. Learn about the 50-year plan to restore a mix of wetlands habitats to the South Bay. Program will begin indoors but will move outside via an easy 0.25-mile trail to a view of the salt ponds. All are welcome!

SF Bay: From the Gold Rush to Today

Learning Center, Fremont

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible story of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Talk is in the outdoor pavilion. All are welcome.

*Family Bird Walk

2:30 p.m. – 4:30 p.m.

Visitor Center, Fremont

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363.

Twilight Marsh Walk

Visitor Center, Fremont

4:00 p.m. – 5:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext 363. Led by Mary and Gene Bobik.

Sunday, December 12

Intro to Nature Drawing for Adults

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Program takes place in the pavilion so please dress warmly. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

Wonders of Our Wetlands

Environmental Education Center, Alviso

11:00 a.m. – 12:30 p.m.

Salt marshes and wetlands make up some of the most diverse and productive ecosystems on the planet. Join us and find out how this is all possible. We will utilize hands-on activities and demonstrations to better understand how wetlands work, and what makes them so valuable to us. Afterwards participants will take a guided walk through the New Chicago Marsh to see some real wetlands in action. RESERVATIONS RECOMMENDED – All Ages are welcome. Call Eric at 408-262-5513 ext. 104.

Introduction to the Refuge

Visitor Center, Fremont

11:00 a.m. – 12:00 p.m.

Meet docent Roy Sasai for this introductory refuge program designed for the young and the young at heart. Learn what to see and do at our nation's first urban national wildlife refuge. Learn how to utilize a visitor center at the start of your adventure, how to properly adjust binoculars and how proper viewing techniques can enhance your experience. Dress warmly and bring rain gear, binoculars, camera, pocket notebook and pencil. Call for reservations at 510-792-0222 ext 363. Limited to 8 participants.

Saturday, December 18

Oliver Salt Works Hike

Eden Landing Ecological Reserve, Hayward

9:00 a.m. – 11:00 a.m.

Hidden among the salt ponds is one of the East Bay's most intriguing historical sites. The refuge and the South Bay Salt Pond Restoration Project are sponsoring this hike to the old Oliver Salt Works within the Eden Landing Ecological Reserve. We'll be walking into an area of the Reserve not yet open to the public so please be prepared to walk two miles on unimproved levees. Reservations required. Please call 408-262-5513 ext.106

*Shorebirds

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

What is a shorebird? How many are there and what are they doing here in the San Francisco Bay Area? Join us for a short slide show and then take a walk along the levees to observe these interesting and sometimes comical visitors. Open to all ages. Led by Ed Kantack. Please call Debra at 408-262-5513 ext. 102 for reservations.

In Search of: Endangered Salt Marsh Harvest Mouse

Learning Center, Fremont

2:00 p.m. – 3:00 p.m.

Come learn about the tiny (about the size of your thumb) endangered Salt Marsh Harvest Mouse. What do they look like? What do they eat? What's in our habitat that makes them unique to the bay area? We will share information about this rarely seen mouse. Led by Art Garibaldi.

Sunday, December 19

Duck Walk

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

Thousands of ducks winter in the San Francisco Bay every year. Hear a short lecture on duck identification. Then we'll head out on the trail to try your new skills. A limited number of binoculars are available to borrow. Dress warmly. Led by Carmen Minch.

*The Salt Marshes: Then and Now

Learning Center, Fremont (Near Visitor Center)

2:00 p.m. – 3:30 p.m.

Approximately 85% of San Francisco Bay's wetlands have disappeared over the last 200 years due to industry and development, impacting the wildlife that lived in and around them. Some of the plants and animals have made a comeback. Learn the history of the salt marshes and the plant and animal life affected by the changes. The presentation includes a slide show followed by a walk to view a salt marsh and the remains of a salt evaporation pond. Led by Gregg Aronson.

January

Saturday, January 8

Bird Photography Hike

Ravenswood Unit (SF2) Menlo Park

8:30 a.m. – 11:30 a.m.

Explore through your camera the newly restored wetlands in our Ravenswood Unit. Docent Alex Baranda will lead you on a hike to several locations to photograph shorebirds and waterfowl. Reservations Required. Call 408-262-5513 ext. 106.

*Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Community Service

Visitor Center, Fremont

9:30 a.m. – 12:00 p.m.

If you are interested in improving the refuge for visitors and for wildlife alike, join us in Fremont for a community service project. We will do either a trash pickup or a planting/weeding project. Dress appropriately for the task and for the weather. Gloves and tools will be provided. Bring your own water bottle. Meet in the parking lot at the Visitor Center. Driving an additional 2.5 miles may be required if project takes place at a different location. For more information, or to make reservations, call 510-792-0222 ext. 363.

* Beginning Bird Watching

Environmental Education Center, Alviso

9:30 a.m. – 11:00 a.m.

Start the new year by discovering something new! Ever wonder what birds we have in our very own community? This will be a great way to learn about many local and migratory birds. Start with a slideshow indoors to learn how to recognize the regulars, then borrow binoculars and talk a walk to try out your new skills. Led by Ceal Craig. All ages welcome. Reservations required. Call Debra at 408-262-5513 ext. 102.

Kite Photography Demonstration

Environmental Education center, Alviso

1:00 p.m. – 3:30 p.m.

Using aerial kite photography, photographer Cris Benton has been keeping an incredible visual record of the South Bay salt ponds and wetlands. Please join us for this wonderful opportunity to see his fascinating images and to learn more about how they are made. Weather depending, Cris will launch his kites and record a bird's eye view of the world for us! For directions or more information, call 408-262-5513 ext. 106.

* Night Sky Party!

Environmental Education Center, Alviso

6:30 p.m. – 8:00 p.m.

Meet the stars of winter! Join our amateur astronomers as we learn about constellations. Make a star chart and then venture outside to view the night sky through a telescope. Afterwards, warm up with some hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly. Fun for the whole family! Program will go on sprinkling rain or shine. Program will be canceled only if it is pouring rain. RESERVATIONS REQUIRED-call Debra at 408-262-5513 ext. 102.

Sunday, January 9

Nature Drawing for Kids

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside so dress warmly. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363.

*Good-bye Salt Ponds, Hello Hotel California

Ravenswood Unit (SF2), Menlo Park

11:00 a.m.

Docent Jane Moss will lead you on a 1-mile hike through the fascinating changes taking place at a former salt pond. Learn about the exciting ways this area is being reshaped as wildlife habitat. Trail is easy and level. All ages and abilities welcome. Reservations required. Call 408-262-5513 ext. 106.

Water Wizards

Environmental Education Center, Alviso

1:00 p.m. – 2:30 p.m.

Life on the "Blue Planet" would not be possible without our most precious resource, water. Learn more about the unique properties of water through hands-on activities, a presentation, and a guided wetlands walk. We will investigate what makes water such an important resource for people and wildlife, and probably get a little wet too! RESERVATIONS RECOMMENDED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

San Francisco Bay: From the Gold Rush to Today

Learning Center, Fremont

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible history of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Talk is in the outdoor pavilion. All are welcome.

Saturday, January 15

Beginning Birding Clinic

Environmental Education Center, Alviso

9:30 a.m. – 12:00 p.m.

If you can't tell your egrets from your cormorants this class is for you! We'll learn about binoculars, identification books, and other birding basics through hands-on activities and conversation. Then we'll go into the field to practice our new skills. Binoculars and books provided during the class. Be prepared to be outdoors in the weather for about an hour. Reservations Required. Call 408-262-5513 ext.106.

Community Service

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

Do you need to fulfill community service requirements? Or would you just like to come lend a hand? Help our native plant garden by removing nonnative plants, pruning, and mulching, or various other jobs that help protect wildlife. It's a great service project for scout groups, high school community service, church groups, and home-schooled groups. Bring your own gloves or borrow a pair of ours – tools are provided. Dress in layers and bring water and sunscreen. Be prepared to get dirty! Ages 9 and up. Participants 18 and under must be accompanied by a chaperone. Call Debra for reservations at 408-262-5513 ext. 102.

Winter Activity Schedule

*Marshlands of Dreams

Visitor Center, Fremont

10:30 a.m. – 11:30 a.m.

Join Paul Mueller on a 1-mile walk of the LaRiviere Marsh Trail to find traces of the past. Prior to marsh restoration, learn how Californians utilized the area for farming, quarrying, salt production, and transportation. There are opportunities for bird watching as well.

*Quackers and Honkers

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

It's winter and most waterfowl have migrated from the North to a milder climate. Many are spending the winter here in the Bay Area. Enjoy a brief slideshow about our migratory ducks and geese. Then join us on a leisurely walk to see which ducks are residing at the refuge this year. Open to all ages. Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.

San Francisco Bay: From the Gold Rush to Today

Environmental Education Center, Alviso

2:30 p.m. – 3:30 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible history of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Program is indoors. All are welcome.

Twilight Marsh Walk

Visitor Center, Fremont

4:00 p.m. – 5:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext 363. Led by Mary and Gene Bobik.

Sunday, January 16

Refuge Exploration

Visitor Center, Fremont

10:00 a.m. - 11:00 a.m.

Walk with docent Roy Sasai on a moderately strenuous 2-mile hike to the hilltop overlook to discover the hidden treasures at the world's first urban national wildlife refuge. Learn about the unique natural and human history which made what we see today. View the refuge at a very high tide. Wear hiking shoes, dress warmly and bring rain gear, binoculars, and a camera if you have them. Call for reservations at 510-792-0222 ext 363. Limited to 8 participants.

*Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Winter Activity Schedule

Introduction to the Refuge

Visitor Center, Fremont

1:00 p.m. – 2:00 p.m.

Meet docent Roy Sasai for this introductory refuge program designed for the young and the young at heart. Learn what to see and do at our nation's first urban national wildlife refuge. Learn how to utilize a visitor center at the start of your adventure, how to properly adjust binoculars and how proper viewing techniques can enhance your experience. Dress warmly and bring rain gear, binoculars, camera, pocket notebook and pencil. Call for reservations at 510-792-0222 ext 363. Limited to 8 participants.

Saturday, January 22

Ravenswood Hike

Bedwell Bayfront Park, Menlo Park

10:00 a.m. – 12:00 p.m.

The 2.3-mile perimeter trail at Bedwell Bayfront Park offers great opportunities to discover winter wildlife and to discuss how future wetlands restoration will shape this piece of the Bay. Offered by the refuge and the Friends of Bedwell Bayfront Park. Meet at the main parking lot bathrooms at Bedwell Bayfront Park. Call 408-262-5513 ext. 106 for information.

* All About Owls

Environmental Education Center, Alviso

10:00 a.m. – 11:30 a.m.

Learn all that you've ever wanted to learn about owls here at the refuge! Where and what do owls eat? Why don't we hear them when they flap their wings? Through an interactive presentation and owl pellet dissection, we'll find the answers to all these questions! Paul Bridges will lead the way. Call Debra at 408-262-5513 ext. 102 for reservations.

*Why Tides Matter

Environmental Education Center, Alviso

2:00 p.m. – 3:00 p.m.

Docent Laurel Stell will talk and walk you through all things tides. What are they? How do they affect wildlife? How have humans reshaped the Bay's tidal lands? Program starts indoors but will move outside for an easy 0.5-mile walk. All are welcome.

*The Salt Marshes: Then and Now

Learning Center, Fremont (Near Visitor Center)

2:00 p.m. – 3:30 p.m.

Approximately 85% of San Francisco Bay's wetlands have disappeared over the last 200 years due to industry and development, impacting the wildlife that lived in and around them. Some of the plants and animals have made a comeback and a few have adapted to the changes. Learn the history of the salt marshes and the plant and animal life

affected by the changes. The presentation includes a slide show followed by a walk to view a salt marsh and the remains of a salt evaporation pond. Led by Gregg Aronson.

Sunday, January 23

Intro to Nature Drawing for Adults

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Program takes place in the pavilion so please dress warmly. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

*Tracking Through The Slough

Environmental Education Center, Alviso

2:00 p.m. – 3:30 p.m.

During this program we will look at the different types of movement that animals use to get around and what that tells us about their lifestyle. Afterwards we will explore the marsh and identify what we find. Discover the stories that the tracks leave behind. RESERVATIONS RECOMMENDED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

Sunday, January 30

Duck Walk

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

Thousands of ducks winter in the San Francisco Bay every year. Hear a short lecture on duck identification. Then we'll head out on the trail to try your new skills. A limited number of binoculars are available to borrow. Dress warmly. Led by Carmen Minch.

February

Saturday, February 5

*Why Tides Matter

Environmental Education Center, Alviso

9:00 a.m. – 10:00 a.m.

Docent Laurel Stell will talk and walk you through all things tides. What are they? How do they affect wildlife? How have humans reshaped the Bay's tidal lands? Program starts indoors but will move outside for an easy 0.5-mile walk. All are welcome.

*Marshlands of Dreams

Visitor Center, Fremont

10:30 a.m. – 11:30 a.m.

Join a Paul Mueller on a 1-mile walk of the LaRiviere Marsh Trail to find traces of the past. Prior to marsh restoration, learn how Californians utilized the area for farming, quarrying, salt production, and transportation.

* Beginning Wildlife Photography

Environmental Education Center, Alviso

2:00 p.m. – 4:00 p.m.

Whether you are interested in photography tips or would like to get to know some of the wildlife commonly sighted

at the refuge, join us! We will discuss ideal sighting and photography conditions, lighting, composition, and equipment. Then we will go on an easy walk and try out our skills. Please be sure to bring your camera or binoculars, and wear comfortable walking shoes. Led by Paul Bridges. Recommended for ages 14 and up. Call Debra at 408-262-5513 ext. 102 for reservations.

Wetlands Restoration: The 50-year Journey

Environmental Education Center, Alviso

1:00 p.m. – 2:00 p.m.

Follow the progress of the largest wetlands restoration project on the West Coast. Learn about the 50-year plan to restore a mix of wetlands habitats to the South Bay. Program will begin indoors but will move outside via an easy 0.25-mile trail to a view of the salt ponds. All are welcome!

Sunday, February 6

Nature Drawing for Kids

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside so dress warmly. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363.

Chompers & Stompers

Environmental Education Center, Alviso

1:00 p.m. – 2:30 p.m.

Ever wondered why birds come in so many shapes, sizes, and colors? Find out why some birds exhibit such wacky behaviors. We will examine different bird specimens we have collected over the years to see how birds have adapted some extraordinary features. Admire the wonders of the bird kingdom and then take a guided walk around the refuge to see these marvelous creatures in action! RESERVATIONS REQUIRED – All Ages are welcome. Call Eric at 408-262-5513 ext. 104.

In Search of: California Grey Fox

Learning Center, Fremont

2:00 p.m. - 3:00 p.m.

Come learn about the California Grey Fox, the only canine that can climb trees. What do they look like? Where do they live? What do they eat? We will share information about this fox to optimize your chances of capturing a glimpse of them. Led by Art Garibaldi.

Saturday, February 12

Bird Photography Safari

Alviso Ponds, Mountain View

8:30 a.m. – 11:30 a.m.

Photograph shorebirds and waterfowl on the former Alviso salt ponds with docent Alex Baranda. Program provides a "backstage pass" to birding spots not usually accessible to the public. Program will require travel both by van and by foot. Please be prepared to hike up to 3 miles in muddy conditions. Reservations Required. Call 408-262-5513 ext. 106.

*Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Community Service

Visitor Center, Fremont

9:30 a.m. – 12:00 p.m.

If you are interested in improving the refuge for visitors and for wildlife alike, join us in Fremont for a community service project. We will do either a trash pickup or a planting/weeding project. Dress appropriately for the task and for the weather. Gloves and tools will be provided. Bring your own water bottle. Meet in the parking lot at the Visitor Center. Driving an additional 2.5 miles may be required if project takes place at a different location. For more information, or to make reservations, call 510-792-0222 ext. 363.

Bike to the Weep!

Alviso Marina County Park, Alviso

10:00 a.m. – 1:00 p.m.

Join microbial ecologist Wayne Lanier, PhD in the Alviso Marina County Park parking lot on a short bike ride to study microbial communities. The weep is a shallow persistent pond fed by seepage. Over the year it undergoes very wide swings in salinity and the result is a uniquely rich microbial community of Cyanobacteria, Archeobacteria, Diatoms, Dinoflagellates, and protozoa. Boots are recommended! Ages 10 and up. RESERVATIONS REQUIRED. Call Debra at 408-262-5513 ext. 102.

*Good-bye Salt Ponds, Hello Hotel California

Ravenswood Unit (SF2), Menlo Park

2:00 p.m.

Docent Jane Moss will lead you on a 1-mile hike through the fascinating changes taking place at a former salt pond. Learn about the exciting ways this area is being reshaped as wildlife habitat. Trail is easy and level. All ages and abilities welcome. Please call 408-262-5513 ext. 106 for information and directions.

Twilight Marsh Walk

Visitor Center, Fremont

4:30 p.m. – 6:00 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363. Led by Mary and Gene Bobik.

Sunday, February 13

Life at the Bottom of the Food Chain

Visitor Center, Fremont

10:00 a.m. – 12:00 p.m.

Wetlands microbes are often called "the lungs of the earth." Explore the dynamics of microbial communities in LaRiviere Marsh ponds. Join microbiologist Wayne Lanier, PhD for a brief presentation; then a microscope hike to LaRiviere Marsh where we will sample and view the most ancient creatures on earth. See how they produce the oxygen we breathe and take up the carbon dioxide we produce. Discover how tides shape these vital communities. Easy short hiking level. Ages 9-90 years. Call 510-792-0222 ext. 363 for reservations.

Introduction to the Refuge

Visitor Center, Fremont

11:00 a.m. – 12:00 p.m.

Meet docent Roy Sasai for this introductory refuge program

designed for the young and the young at heart. Learn what to see and do at our nation's first urban national wildlife refuge. Learn how to utilize a visitor center at the start of your adventure, how to properly adjust binoculars and how proper viewing techniques can enhance your experience. Dress warmly and bring rain gear, binoculars, camera, pocket notebook and pencil. Call for reservations at 510-792-0222 ext 363. Limited to 8 participants.

Barnacles, Mussels, and Snails, Oh My!

Meet at the Dumbarton Fishing Pier, Fremont

2:00 p.m. – 3:00 p.m.

Join docent Roy Sasai to learn about the bay shore life and its strange and unique ways of survival. We will search for and capture some of the strange creatures to see them up close during this low-tide adventure. Learn how they feed and survive in the largest estuary on the West Coast. We will also learn about how the bay has changed over the past 200 years and what is yet to come. This program is for the young and young at heart. Wear sturdy shoes, dress warmly, bring rain gear and magnifying glasses for optimal viewing. Call for reservations at 510-792-0222 ext 363. Limited to 8 participants.

Saturday, February 19

*Beginning Bird Watching

Environmental Education Center, Alviso

9:30 a.m. – 11:00 a.m.

Do you wonder what birds we have in our very own community? This will be a great way to learn about many local and migratory birds. Start with a slideshow indoors to learn how to recognize the regulars, then borrow binoculars and take a walk to try out your new skills. Led by Ceal Craig. All ages welcome. Reservations required. Call Debra at 408-262-5513 ext. 102.

*ABC's of Raptors

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

Is it an accipiter or buteo? It could also be a falcon or a kite. Learn the difference as we explore the world of birds of prey that we call raptors! Recommended for grades 3 and up. Kids will make their own raptor guidebook! Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.

*The Salt Marshes: Then and Now

Visitor Center, Fremont

2:00 p.m. – 3:30 p.m.

Approximately 85% of San Francisco Bay's wetlands have disappeared over the last 200 years due to industry and development, impacting the wildlife that lived in and around them. Some of the plants and animals have made a comeback and a few have adapted to the changes. Learn the history of the salt marshes and the plant and animal life affected by the changes. The presentation includes a slide show followed by a walk to view a salt marsh and the remains of a salt evaporation pond. Led by Gregg Aronson.

Sunday, February 20

Mysteries of Wastewater Treatment

Environmental Education Center, Alviso

11:00 a.m. – 12:30 p.m.

The San Jose-Santa Clara Water Pollution Control Plant treats hundreds of millions of gallons of wastewater from millions of people every day using some of the most advanced treatment technologies available. Come and learn

Winter Activity Schedule

about what it takes to make this interesting process happen through a slideshow and hands-on activity that attempts to treat "wastewater". A tour of the Water Pollution Control Plan is not included as a part of this program. RESERVATIONS RECOMMENDED – All Ages are welcome. Call Eric at 408-262-5513 ext. 104.

Saturday, February 26

Ravenswood Hike

Bedwell Bayfront Park, Menlo Park

10:00 a.m. – 12:00 p.m.

The 2.3-mile perimeter trail at Bedwell Bayfront Park offers great opportunities to discover winter wildlife and to discuss how future wetlands restoration will shape this piece of the Bay. Offered by the refuge and the Friends of Bedwell Bayfront Park. Meet at the main parking lot bathrooms at Bedwell Bayfront Park. Call 408-262-5513 ext. 106 for information.

Intro to Nature Drawing for Adults

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Program takes place in the pavilion so please dress warmly. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

*Family Bird Walk

2:30 p.m. – 4:30 p.m.

Visitor Center, Fremont

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363.

Sunday, February 27

San Francisco Bay: From the Gold Rush to Today

Learning Center, Fremont

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible story of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Talk is in the outdoor pavilion. All are welcome.

*Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Field Trips to the Refuge

General Field Trip Program Information

We offer FREE field trip programs at two sites at the Don Edwards San Francisco Bay National Wildlife Refuge. Wetland Round-Up field trip programs are offered at our Headquarters in Fremont, and Wetland Round-Up and Slow the Flow field trip programs are offered at the Environmental Education Center in Alviso. These programs actively involve teachers, adult volunteers, and students in investigating the diverse habitats and wildlife at the refuge. The hands-on, small-group activities are designed to teach basic ecological concepts and to introduce endangered species, migratory birds, and wetland habitats to the students. All programs have been correlated to the appropriate State of California Education Standards.

Educators and adult leaders conduct their own field trips after attending a Field Trip Orientation Workshop. The Orientation Workshop allows you to design and conduct your own field trip. In addition, adult volunteers must be recruited to lead the activities at the different learning stations and to chaperone the rotation groups of students. We provide easy to follow “scripts” for each station, but both “leaders” and “chaperones” are strongly encouraged to attend a Field Trip Orientation Workshop. It is our policy that lead educators must attend training every two years. Location of activities and trail conditions may vary. Please call for accessibility information.

Field Trips at the Learning Center in Fremont

Wetland Round-Up

Explore the habitats of the refuge! Investigate creatures of the mud flats, collect plankton from the slough, and taste pickleweed from the salt marsh. This field trip is designed for grades K-6, for up to 65 students. Wetland Round-Up will be offered Tuesday – Friday from March to May, 2011. **Spring reservations will begin on December 1, 2010.**

NEW MAIL-IN RESERVATION PROCEDURES

can be found on our web site at http://www.fws.gov/desfbay/EE_Registration.htm.

Field Trip Orientation Dates at the Learning Center in Fremont

To be announced.

Call the Environmental Education Intern at 510-792-0222 ext. 475 for further information.



Field Trips at the Environmental Education Center in Alviso

Wetland Round-Up

Investigate the butterflies in the butterfly garden, taste pickleweed in the salt marsh, or discover the creatures that live in the slough water on a Wetland Round-Up field trip. This field trip program is designed for up to 65 students in grades K-6. Wetland Round-Up is offered Monday – Thursday from March to May, 2011.

We will begin scheduling Spring 2011 field trips on Tuesday, December 7 from 4:00 p.m. – 5:00 p.m. For more information, call the Environmental Education Intern at 408-262-5513 ext. 103.

Field Trip Orientation Workshop Dates at the Environmental Education Center in Alviso

To be announced.

Call the Environmental Education Intern at 408-262-5513 ext. 103 to attend an orientation. ** Please note: The cut off date to make a reservation is the Friday before each orientation date.

The Slow the Flow Program

Slow the Flow provides an experiential learning environment for students and educators to explore the topics of water use, wastewater treatment, and habitat preservation. Activities and presentations focus on the relationship between personal habits and their effects on local habitats. Slow the Flow is an environmental education program offered at no cost through the cooperating efforts of the City of San Jose, U.S. Fish and Wildlife Service, and the San Francisco Bay Wildlife Society. Slow the Flow programs are available to educators and groups located in San Jose, Alviso, Milpitas, Santa Clara, Saratoga, Monte Sereno, Los Gatos, Campbell, and Cupertino.

Programs are offered to 5th – 12th grade students. A modified field trip is available for college groups. Educators are encouraged to contact us to discuss options for customizing field trips and classroom presentation activities and schedules.

Reservations for the Slow the Flow program are on a first-come basis. For more information or to make a reservation for Spring 2011, call Eric McKee, the Slow the Flow Program Coordinator at 408-262-5513 ext. 104 or email at sfbay.slowtheflow@gmail.com.

Scout and Youth Group Programs

The Don Edwards San Francisco Bay National Wildlife Refuge offers free hands-on, programs for youths. During the programs participants learn about endangered species, migratory birds, wetland habitats, and the relationship between personal habits and their effects on the San Francisco Bay. These programs are designed to meet badge/patch requirements of Scout Groups, but anyone can participate. Because of the popularity of such programs, reservations are required. *Badges are not provided.*

Below are the names, dates, and descriptions of the programs. Programs at



the Environmental Education Center are sponsored by the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Francisco Bay Wildlife Society.

Youth Group Programs at the Environmental Education Center in Alviso

Note: Ratio of 1 adult per 5 children maximum. Space is limited to 20 people, including siblings. Once the program is full there will be a waiting list. Call Debra at 408-262-5513 ext. 102.

Saturday, December 18

Webelos Naturalist Badge Environmental Education Center, Alviso 10:30 a.m. – 12:30 p.m.

Anyone out there need to earn a Naturalist badge? We've got the program that's right for Webelos! Learn about birds, migration, flyways, food chains, human impact, and the importance of wetlands. Then take a walk and use our binoculars to spot birds in the wild.

Saturday, January 22

Junior Girl Scout Wildlife Badge Environmental Education Center, Alviso 2:00 p.m. – 4:00 p.m.

Calling all Junior Girl Scouts of Santa Clara County! Anyone out there need to earn a Wildlife badge? We've got the program just for you! Come to the Wildlife Refuge and learn about features of different crea-

tures, observe animal behavior, see how you can help wildlife, and so much more. Take a walk to explore the habitats at the south end of the bay.

Saturday, February 5

Brownies Eco-Explorer Patch Environmental Education Center, Alviso 10:00 a.m. – 12:00 p.m.

Come and learn about habitats, food chains, and how you can help wildlife. Then take a walk to explore the habitats at the south end of the bay. Space is limited to 20 people and program fills quickly.

Youth Group Programs at the Refuge Headquarters in Fremont

The Refuge Headquarters offer Webelos programs for up to 15 Webelos. Call 792-0222 ext. 363 for reservations. All programs are led by June Smith.

Saturday, December 11; Sunday, January 30; and Saturday, February 19

Webelos Naturalist Program 10:00 a.m. – 12:00 p.m.

Attention Webelos! Earn your naturalist badge in just two hours. During this hike, learn about birds, flyways, food chains, and the importance of wetlands. Bring your binoculars, or borrow one of ours.

TIDELINE

Published quarterly by San Francisco Bay National Wildlife Refuge Complex, with funding from San Francisco Bay Wildlife Society.

Volume 31, Number 4

Editor: Carmen Minch
To receive *Tideline*, email carmen_leong-minch@fws.gov, or write to: *Tideline*, San Francisco Bay National Wildlife Refuge Complex, 9500 Thornton Ave, Newark, CA 94560.

San Francisco Bay National Wildlife Refuge Complex

Administered by the U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex exists to preserve wildlife habitat, protect threatened and endangered species, protect migratory birds, and provide opportunities for nature study. Seven refuges are managed from the headquarters in Fremont: Antioch Dunes NWR, Don Edwards San Francisco Bay NWR, Ellicott Slough NWR, Farallon NWR, Marin Islands NWR, Salinas River NWR, and San Pablo Bay NWR.

Project Leader: Mendel Stewart
Deputy Project Leader: John Bradley
Wildlife Refuge Specialist: Val Urban

Don Edwards Refuge Manager: Eric Mruz
Don Edwards Wildlife Specialist: Melisa Helton
Don Edwards Warm Springs Unit Manager: Ivette Loreda
Farallon Refuge Manager Gerry McChesney
Farallon Refuge Wildlife Specialist: Zach Coffman
North Bay Refuges Manager: Don Brubaker
North Bay Wildlife Specialist: Louis Terrazas
South Bay Refuges Manager: Diane Kodama
Public Affairs Officer: Doug Cordell
Refuge Planner: Winnie Chan
Outdoor Recreation Planners: Jennifer Heroux
and Carmen Minch
Environmental Education Specialists: Tia Glagolev,
Genie Moore, and Kimby Wells
Volunteer Coordinator: Paul Mueller
Law Enforcement Officers: Jared Klein
and Scott Neumann
Biologists: Joy Albertson, Susan Euing,
Meg Marriott, Cheryl Strong, and Rachel Tertes
Administrative Staff: Lucinda Ballard, Patricia
Compton, and Ellen Tong
Maintenance Staff: Juan Flores, James Griffin, Robert
Morin, Calvin Sahara,
Michael Springman, and Ed Van Til

San Francisco Bay Wildlife Society

A nonprofit 501(c)(3) cooperating association established in 1987 to promote public awareness and appreciation of San Francisco Bay and fund education and outreach programs at San Francisco Bay National Wildlife Refuge Complex.

Board of Directors

President: Ceal Craig
Vice President: Terry Smith
Treasurer: Bart Anderson
Secretary: Cheryl Davis
Directors: Christopher Kitting, Karen Natoli-Maxwell,
Sue Ten Eyck, David Riensche, and Varon Smith

Staff

Interpretive Specialist: Debra King
Education Specialist: Eric McKee
Restoration Ecologist: David Thomson
Program Administrator: Sue Ten Eyck

Tideline is On-Line

Visit our web site, which features past issues of *Tideline*, at <http://www.fws.gov/desfbay>

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 FISH AND WILDLIFE SERVICE
 DON EDWARDS SAN FRANCISCO BAY
 NATIONAL WILDLIFE REFUGE
 9500 Thornton Ave
 Newark, CA 94560

OFFICIAL BUSINESS
 PENALTY FOR PRIVATE USE, \$300

FIRST-CLASS MAIL
 POSTAGE & FEES PAID
 U.S. Fish & Wildlife Service
 Permit No. G-77

SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE COMPLEX

WINTER 2010
 Volume 31, Number 4

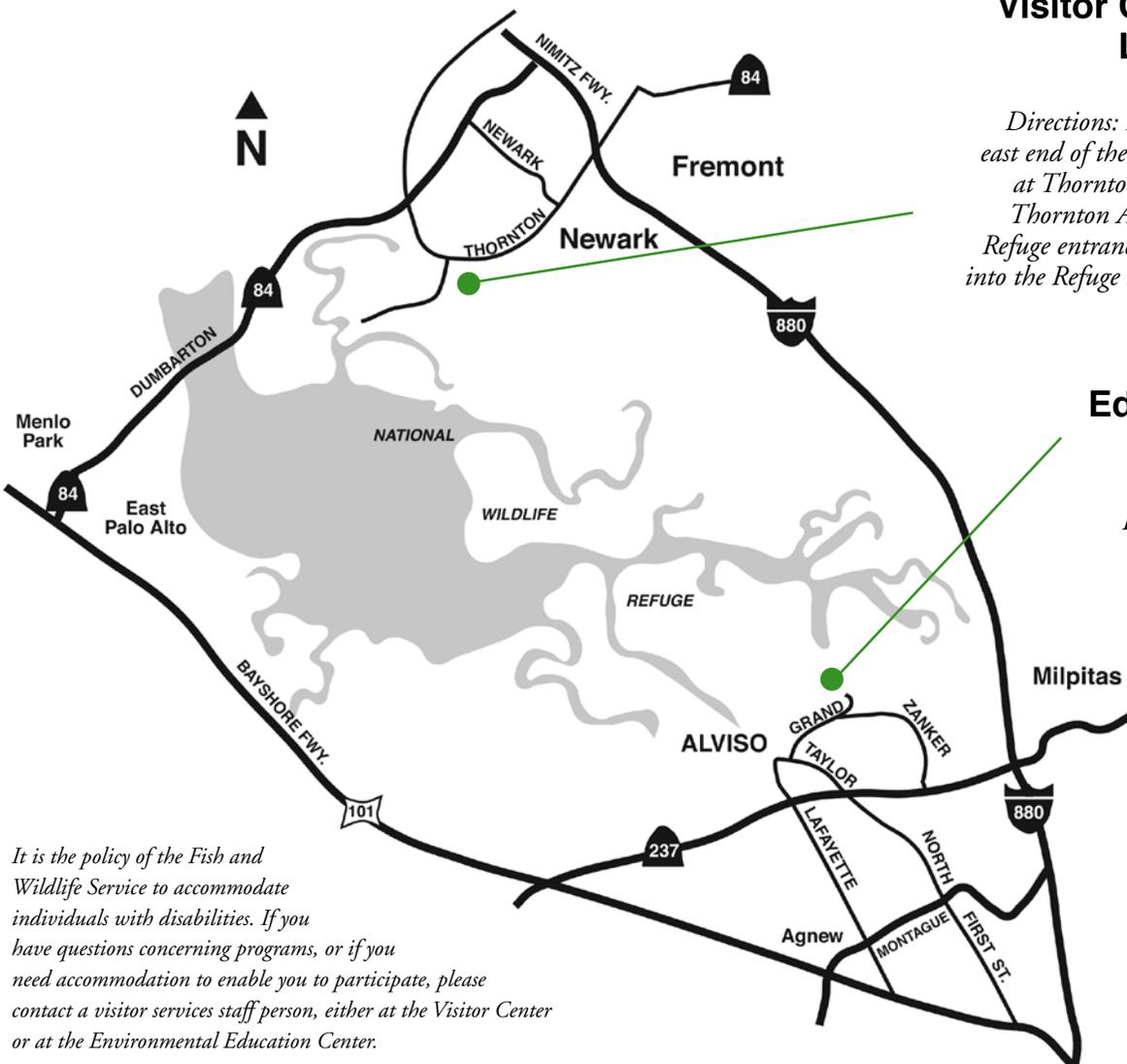
Tideline



Inside This Issue

- 1 Rare Plant: Bird's Beak
- 3 Refuge Reflections
- 4 Project Updates
- 5 Youth Conservation Corps
- 6-7 Refuge Dispatches
- 9 Farrallon Exhibit at CA Academy of Sciences
- 10-13 Winter Activities
- 14 Field Trips to the Refuge

Don Edwards / Antioch Dunes / Ellicott Slough / Farallon Island / Marin Islands / Salinas River / San Pablo Bay



Visitor Center, Fremont Learning Center

(510) 792-0222 ext. 363
 Directions: From Highway 84 (at the east end of the Dumbarton Bridge), exit at Thornton Avenue. Travel south on Thornton Avenue for 0.8 miles to the Refuge entrance on the right. Turn right into the Refuge and follow the signs to the Visitor Center.

Environmental Education Center, Alviso

(408) 262-5513
 Directions: From I-880 or Highway 101, exit on Highway 237 toward Mountain View/Alviso. Turn north onto Zanker Road. Continue on Zanker Road to the Environmental Education Center entrance road (a sharp right turn at Grand Blvd.) The distance from 237 to the entrance road is 2.1 miles.

It is the policy of the Fish and Wildlife Service to accommodate individuals with disabilities. If you have questions concerning programs, or if you need accommodation to enable you to participate, please contact a visitor services staff person, either at the Visitor Center or at the Environmental Education Center.