

Tideline



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

California Streamin': Steelhead Attempts a Comeback in California

by Cheryl L. Davis

In February 2008, two adult steelhead trout nicknamed Bonnie and Clyde made headlines when they were sighted, captured, and released by the Alameda Creek Alliance. The charge: the first pair of adult steelhead to attempt to spawn in the Alameda Creek

family, Salmonidae, which includes all salmon, trout and chars. Unlike its more famous family member, the king or chinook salmon, steelhead do not die upon spawning and are capable of returning more than once to spawn or reproduce.

If you've fished a stream or river in

large, strong fish can travel hundreds of miles to spawn in their streams of origin.

Members of this species are not locked into one form or the other but can shift forms as environmental pressures dictate. If drought conditions or manmade barriers prevent steelhead from reaching the ocean, they can remain rainbow trout. Conversely, resident rainbow trout can become steelhead and engage in anadromy if ocean access becomes available. This ability to live either life history pattern helps this species adapt to unpredictable environmental conditions. Also aiding this species in its evolutionary process is its chromosome number. Trout like other salmon family members have four sets of chromosomes rather than the normal two sets of most vertebrates. The design gives them increased diversity and hence survival.

Steelhead themselves have two individual life history forms, winter and summer. Winter-run steelhead or migration is made up of adults who have lived approximately two to three years in the ocean, migrating or entering streams when winter rains make passage to spawning grounds possible.

Populations of both run types occur in California coastal rivers and streams from Malibu Creek to north of the Oregon/California border. In California, coastal streams are dominated by winter-run steelhead, which return to spawn as soon as streams are high, mostly from December through early April.

Females make several nests or redds in



Adult steelhead

©C.L. Kitting, CSU East Bay

(located in Union City) watershed in four decades. Once abundant in coastal and Central Valley rivers, the California population is presently less than half the population 30 years ago. Despite its incredible instinct for survival and complex life cycle, steelhead trout populations are federally listed as threatened along the central California coast, and as endangered on the southern California coast.

Steelhead are members of the salmon

California, it's likely you've angled for coastal rainbow trout (*Oncorhynchus mykiss irideus*). Unbeknownst to many, there are two forms of this one species: rainbow trout and steelhead trout. Rainbow trout are homebodies, living their entire lives in their natal streams while traveling steelhead trout spend most of their adult lives in the ocean. Steelhead are anadromous; born in fresh water they emigrate to the ocean to mature, returning to fresh water to spawn. These

continued next page

the gravel of the streambed and lay between 200-2,000 eggs. The larger the female, the more eggs she tends to produce. Gravel roughly the size of quarters (though gravel composition varies) is the preferred substrate. Using her strong tail to sweep away the gravel, she lays her eggs in the depression of a shallow pool or riffle. The stream's flowing water passes dissolved oxygen to the eggs, allowing them to thrive.

After the eggs are laid in the redd, a male quickly deposits his sperm or milt on the eggs, thereby fertilizing them. The female covers the nest with gravel from the next redd she excavates upstream. To become successful in passing its genes to the next generation male steelhead must be vigilant and alert. Oftentimes a sneaker male, an immature steelhead, is hovering nearby for the opportunity to sneak in and spawn with the female. Sneaker males can be steelhead that have not yet gone to sea or smaller males returning early from the sea. Sometimes these little guys are lucky to catch a female spawning in the absence of larger males so it seems a successful evolutionary strategy.



Juvenile steelhead with parr marks

Courtesy of UCSC

After three to four weeks, depending on water temperature, the eggs hatch. The newly hatched alevins (pronounced like the name Alvin) stay buried under the gravel and are nourished by a connected yolk sac. After two to three weeks juvenile steelhead called fry emerge and become parr, so named for the dark ovals which are present in a lateral line along their body.

Juvenile steelhead begin to stake out feeding stations where they will feed facing upstream, waiting for prey in the forms of drifting aquatic organisms and terrestrial insects. As the steelhead mature they



Rainbow trout, Kern River

Courtesy of CDFG

become more aggressive and often defend their feeding stations, nipping and moving aggressively towards other fish that make the mistake of coming too close.

Eventually, steelhead trout migrate to sea at one to three years of age at approximately six to 10 inches fork length (measure from the tip of the snout to the middle of the fork of the tail). After one to two years at sea they return at approximately 14-26 inches and three to 12 pounds. Steelhead can become quite large, weighing up to 55 pounds and measuring 45 inches.

Until steelhead trout migrate to the sea, they look identical to rainbow trout; they appear as greenish, silvery trout with numerous black spots on the tail fins and back and a pink or reddish lateral band. As the fish mature, the appearance of steelhead changes as they begin to go through smoltification, the process of becoming smolts. This process is a combination of physiological, morphological, biochemical and behavioral changes, including development of color changes and a tolerance for seawater, that take place in steelhead as well as other anadromous members of the salmon family in preparation for ocean survival. Steelhead trout generally develop a more pointed head, grow larger than rainbow trout and the reddish lateral band sometimes fades or disappears.

Out migrating steelhead generally leave the streams in spring or early summer depending on flows. Those migrating from their home streams to the sea feed on estuarine invertebrates and marine krill but consume smaller fish as they increase in size. Several studies have emphasized the importance of lagoons (areas where fresh-

water streams and rivers meet the sea) in young steelhead growth. At sea, fish, squid, crustaceans, and other small fish including other trout are all part of the diet. Steelhead can live as long as 11 years but six to seven years is more common.

Steelhead were once abundant in California's coastal and Central Valley rivers and streams. Because most streams and rivers in California have been dammed multiple times, steelhead runs to and from the ocean have been blocked. In addition, water diversions from dams and pumping have dried many streams which formerly provided deep pool summer habitat for fish. Water temperature is also a factor. Diversions and sediment from roads, logging, urbanization and construction coat spawning gravel, often smothering developing eggs.

The central California coast steelhead and south-central coast steelhead have been designated as Evolutionary Significant Units (ESU). An Evolutionary Significant Unit is a population of organisms that is considered distinct for purposes of conservation. The Endangered Species Act not only protects a species from extinction, it also protects populations of a troubled species. For instance, mountain lions, also known as pumas are federally listed as threatened in Florida, but not in California.

Both ESUs identified above were listed as threatened under the Endangered Species Act in 1997 by the National Marine Fisheries Service (NMFS); an agency administered by the National Oceanic and Atmospheric Administration (NOAA), a federal agency. NOAA also has designated many streams in California as

Critical Habitat for steelhead, determining that streams or sections of streams where steelhead reside are essential habitat to the survival of the species and require extra protection.

Though conservation efforts in the salmon family have focused heavily on salmon due to its commercial and recreational importance, in the last 10 years steelhead conservation and restoration has been receiving increasing attention. Conservation efforts have occurred and are on-going at the federal, state, tribal, regional, and local levels.

At the federal level, the Pacific Coast Salmon Recovery Fund was established by Congress in 2000 to support the restoration of all salmon species. The fund is overseen by NMFS and carried out by state and tribal governments. At the state level, California Department of Fish and Game developed the Steelhead Restoration and Management Plan in 1996 and have initiated steelhead monitoring and the restoration of stream habitat for this species.

At a local level the Salinas River Basin has been designated as Critical Habitat

for steelhead. The Salinas River National Wildlife Refuge encompasses the Salinas River Lagoon, an area identified as likely to contain small numbers of steelhead. Additionally, the Alameda Creek Fisheries Restoration Workgroup established in 1999 to restore steelhead to the Alameda Creek watershed released a January 2008 document which provides a conceptual recovery strategy for steelhead in Alameda Creek. Alameda Creek empties to the Bay near the Don Edwards San Francisco Bay National Wildlife Refuge and historically had yearly runs of steelhead. And a remnant run still exists. However the main barrier to upstream migration is the 10-foot drop structure between the Union Pacific Railroad and the Bay Area Rapid Transit (BART) tracks sometimes referred to as the BART Weir.

The Alliance has been organizing rescues of migrating salmon species, including steelhead for several years at this site. Bonnie and Clyde, the most recent example, had been radio-tagged and moved above the barrier to Stonybrook Creek. One month later, they were seen engaging in spawning behavior.

The growing evidence on how the BART Weir impacts steelhead populations resulted in the Alameda Flood Control District and Alameda County Water District announcing their goal to construct a fish ladder for steelhead and other fish by 2010.

Still, successes are small in the face of the devastating impact human activities have had on this magnificent species. On-going conservation and restoration efforts must continue and be intensified in the future with particular focus on the goals of removal or modification of existing dams that obstruct salmon migration, restoration of degraded habitat, acquisition of prime habitat, and improved water quality and stream flows.

Cheryl L. Davis is an Environmental Planner for the City of San Francisco and a Research Associate at California State University East Bay where she received her M.S. in Biology. Her thesis research identified two previously unrecorded aquatic snail species in restored marshes in southern Suisun Bay. She has also contributed to an upcoming report on the current and historical status of steelhead in streams from San Mateo County to Malibu County, California.

Volunteers – The Backbone of Our Refuges

This quarter's Refuge Reflections is written by Deputy Project Leader John Bradley.

The San Francisco Bay National Wildlife Refuge Complex is fortunate for its many dedicated volunteers who contribute thousands of hours each year. During Fiscal Year 2007, volunteers contributed 108,652 hours of their time for a savings in labor costs to the Complex of \$2,229,800. Incredibly, each of our volunteers contributed an equal or greater number of hours in FY07 as they did during the previous year. Annually these volunteers assist the Complex in meeting its goals to protect sensitive species, provide wildlife habitat, and educate the public about the importance of its role in the environment. They are the backbone of our agency and are truly appreciated.

A member of the volunteering community passed away recently and left a legacy of environmental advocacy and stewardship not only in regard to the San Francisco



Refuge Reflections

by John Bradley

Bay National Wildlife Refuge Complex but in the greater San Francisco Bay Area. Janice Delfino will be profoundly missed. Janice was one of the founding members of the Citizens Committee to Complete the Refuge. The Committee's mission is to "save the Bay's remaining wetlands by working to place them under the protection of the Don Edwards San Francisco Bay National Wildlife Refuge, and to foster world-wide education regarding the value of all wetlands."

Janice, her husband Frank, and other Committee members passionately promoted and pursued the public acquisition, preservation and restoration of the San Francisco baylands, tidal sloughs, mudflats and marshes, vernal pools and other critical wildlife habitats that are essential to the integrity and sustainability of the San

Francisco Bay estuarine ecosystem. In the field, Janice was tireless in her efforts to help protect endangered species like the California least terns at Alameda Point and assisted in administrative tasks such as affixing mailing labels onto thousands of copies of the *Tideline* newsletter every quarter.

I will always remember Janice as a loving individual who, in her unassuming manner, mentored staff and volunteers alike. She demonstrated the volunteer ideal of helping others.

Speaking for the staff of the San Francisco Bay National Wildlife Refuge Complex, let me share our gratitude for the time that Janice and ***all our volunteers***, have given toward protecting wildlife and the local landscape on which we all depend. ***Thank you! Your help has been invaluable. You are much appreciated.***

South Bay Science Symposium 2008: The Science behind Restoration of the South Bay

by Cheryl Strong

The Don Edwards San Francisco Bay National Wildlife Refuge, U.S. Geological Survey, and the College of Social Sciences and Department of Environmental Studies at San Jose State University are pleased to announce the 2nd South Bay Science Symposium on Thursday, September 25, 2008 from 8:45 a.m. to 5:15 p.m. A reception and poster exhibit will follow. This year's symposium will take place at the Dr. Martin Luther King, Jr. Library located in downtown San Jose on the campus of San Jose State University. This event is free and open to the public. Themes include climate change and restoration, wildlife use of changing landscapes, wildlife and public access, invasive species and contaminants, and hydrology and sedimentation.

The purpose of this event is to allow

researchers studying ecological processes and physical and biological factors in the South Bay to present their findings to land managers, fellow scientists, and the interested public. The symposium will bring forth new data and information that will assist the restoration and management of the deactivated Cargill salt ponds now owned and operated by the Don Edwards San Francisco Bay National Wildlife Refuge and California Department of Fish and Game. Specific topics to be discussed that are relevant to the South Bay Salt Pond Restoration Project are carbon sequestration and tidal salt marsh restoration, the influence of sea level rise on the South San Francisco Bay, endangered species conservation and management, the possible impacts of public access on wildlife, mercury contamination in the South Bay, and the status of the first refuge ponds

restored to tidal action, also known as the "Island Ponds."

The symposium will also feature studies conducted in the greater San Francisco Bay Area and create conversations among the scientists conducting the research. It will also allow land managers to restore and manage the ponds more efficiently. A photography exhibit by Charles Benton, Professor of Architecture at the University of California at Berkeley, which illustrates the changes in the salt ponds over the past few years will be on display. His non-conventional technique of using a kite to take photographs provides a "bird's eye" view of the landscape.

For updates and scheduled talks on the Symposium, check the South Bay Salt Pond Restoration Project website at www.southbayrestoration.org.

Coastal Clean-Up Day

Dumbarton Fishing Pier Parking Lot
1 Marshlands Rd, Fremont

Saturday, September 20
8:30 a.m. – noon

Join thousands of people around
the world for International Coastal
Clean-Up Day.

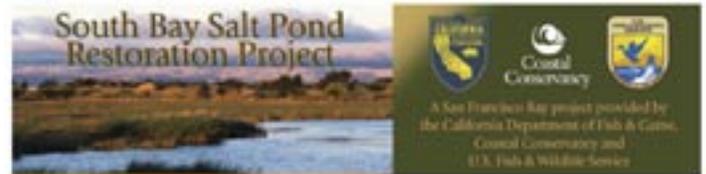
Help wildlife and the environment in your own backyard. We'll supply plastic gloves and trash & recycling bags. You supply energy, sturdy shoes, sun protection, and clothes you don't mind getting dirty.

RESERVATIONS REQUIRED!

Call 510-792-0222 ext. 43 to sign up.
Space is limited to 50 people.

Children under age 18 must have parental approval.

For more information, contact Carmen Minch
at 510-792-0222, ext. 38



South Bay Science Symposium 2008

Research Supporting Restoration of the South Bay

Thursday, September 25
8:45 a.m. - 7:00 p.m.

This symposium is free and open to the public.
Symposium will be held at San Jose State University
at the Martin Luther King, Jr. Library.

Registration	8:45 a.m.
Presentations and Discussion Room 229 A/B	9:00 a.m.
Reception and Poster Exhibits Room 255/257	5:15 p.m.

For details including how to submit abstracts and present a poster, or for an agenda and driving directions, please refer to the South Bay Salt Pond Restoration Project website at: <http://www.southbayrestoration.org>

Organized by the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and San Jose State University's Department of Environmental Studies and College of Social Sciences.



SAN PABLO BAY NATIONAL WILDLIFE REFUGE

Join us in the North Bay for these **FREE** events!

Fall Events 2008

September 27th

Public Lands Day:

Refuge Headquarters

- Join thousands of people around the country working together to help wildlife and the environment. Supplies will be provided, but dress in work clothes. Refer to our website for details.
- Reservations are required!



October 25th

Fishing Day:

Refuge Headquarters

Learn the basics of fishing in beautiful San Pablo Bay. We'll provide poles, bait, and tackle. Volunteers will be on hand to assist. Space is limited so call ahead. Refer to our website for further details.



Reservations are required!

November 15th

Pilgrim Planting:

Refuge Headquarters

Come work with our restoration team! We will be planting natives as part of our effort to restore and enhance natural habitat for wildlife on the refuge. Bring your own work gloves and wear your gardening duds. Please refer to our website for further information and details.

Reservations are required!



December 6th

"Holly Days" for the Birds:

Refuge Headquarters

Learn about wintering birds on the refuge and the native plants they enjoy. Find out what you can do to help wild birds in your own backyard. Make a winter bird treat to take home. Please note: the bird treat may contain peanuts! Refer to our website for more info.

Reservations are required!



Address: 7715 Lakeville Hwy,
Petaluma, CA 94954
Phone# 707-769-4200 ext 103

Additional Information:
www.fws.gov/sfbayrefuges
CALL 707-769-4200 ext 103 FOR RESERVATIONS



San Francisco Bay National Wildlife Refuge Complex
 1 Marshlands Rd Fremont, CA 94536

OPEN HOUSE

OCTOBER 18, 2008

1 P.M. - 5:30 P.M.

Connect with nature! Visit the San Francisco Bay National Wildlife Refuge Complex Headquarters during National Wildlife Refuge Week. Participate in one or all of these free programs.

Programs include:

Introduction to Geocaching
 Presented by REI Outdoor School

Native Plant Sale

Take Your Picture with the Blue Goose

Puppet Show plus Make a Finger Puppet

Introduction to Bird Photography

Family Bird Walk

Five Tools You Can Use to Connect
 Children with Nature

Learn about the Refuge's New Virtual
 Geocaching Program

Practice Your Duck ID Skills



For a complete schedule, description, and times, visit our website at <http://www.fws.gov/desfbay> in September, or call Carmen Minch at 510-792-0222, ext. 38.





Night of the Living Marsh

**Saturday, October 4th, 2008
6:00 PM - 8:30 PM**

Don Edwards San Francisco Bay National Wildlife Refuge
Environmental Education Center in Alviso

Where San Jose meets the Bay!



All Activities are FREE!

Face Painting!

Crafts!

After-Dark Adventure Walks!

Hands on Activities!

Twilight Story Time!

Dress Warmly!



For directions and more information, visit
<http://www.fws.gov/desfbay/> or call (408) 262-5513.

Night of the Living Marsh is sponsored by: San Francisco Bay Wildlife Society, Santa Clara Valley Urban Runoff Pollution Prevention Program, City of San Jose, and US Fish & Wildlife Service.

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 April 15, 2008 and July 10, 2008. These gifts will be used for capital, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.

Employer Matching Gift Program

United Airlines Matching Gift Program

Sponsor

Richard & Imogene Hilbers

Participant

Helen E Conway, Jane Hicks, and Philip & Roberta Lathrap

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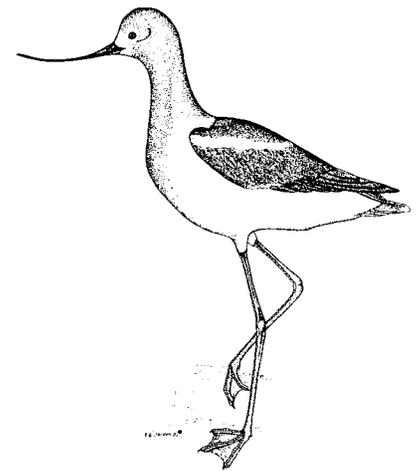
Gayle Anderson, George & Beatrice Castro, Thomas & Catherine Crumpton, Steve Ferguson, Kenneth Goss, Jan Z Hintermeister, Gerald E & Susan C James, John B & Laura Jamieson, Brian & Fran Kaye, John Lukas, John & Melanie McKenna, Jean McNamara, Tom & Emily Nawalinski, Jean Staats, Bill & Rite Vandenburg, and Kathleen Yoshikawa

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Harriette Atkins, Ruth Baily, Lyle P Bickley, Doris M Brown, Patricia Callaway, Diane Finke, Steve Ferguson, Eldon Gresham, Mary Ann Irvine, Miriam F Leiseroff, Silvia C McLaughlin, May Manabe, Laura Avbery, Alberto Martinez, Margaret Gale Moore, Jean L Salmon, Dorothe F Silveria, Don J Thompson, Phylis J Vickers, Jan Walsh, Craig Williams, and Norma Zimmer



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 510-792-0222 ext. 40.

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:

- | | | | | |
|--|---|--|--|---|
| <input type="checkbox"/> \$20 Student/Senior | <input type="checkbox"/> \$50 Family | <input type="checkbox"/> \$100 Participant | <input type="checkbox"/> \$250 Sponsor | <input type="checkbox"/> \$1,000 Leader |
| <input type="checkbox"/> \$35 Individual | <input type="checkbox"/> \$75 Supporter | <input type="checkbox"/> \$200 Corporation | <input type="checkbox"/> \$500 Sustainer | |

Check Visa or MasterCard # _____ Exp. Date _____

Signature _____

Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ *Thank you for your support!*

U.S. Fish & Wildlife Service

Don Edwards San Francisco Bay *National Wildlife Refuge*



Connections to Pier Fishing

Saturday, October 11
8:00 a.m. – noon

**Learn how to fish on the Dumbarton
Fishing Pier in Fremont!**

Space is limited to the first 50 people. All equipment will be provided. Please come on time. Call 510-792-0222 ext. 43 for reservations. For more information, see page 11.



Sale of Native Plants

Newark Slough Learning Center located down the hill from the Visitor Center in Fremont

Saturday, October 18
1:00 p.m. – 4:00 p.m.

Save water and landscape your yard with California native plants. Attract hummingbirds and butterflies to your neighborhood.

For more information, call Carmen Minch at 510-792-0222.

SF Bay NWRC and REI Outdoor School presents

Introduction to Geocaching



Saturday, October 18
1:00 p.m. - 3:00 p.m.

**1 Marshlands Rd, Fremont
Newark Slough Learning Center
(Down the hill from the Visitor Center)**

Learn what you need to know about Geocaching. REI Outdoor School will be loaning GPS units for this free demonstration. Then, head over to the Refuge Information table and pick up coordinates for the Refuge's new virtual geocaching program.

Space is limited! Please call 510-792-0222 ext. 43 for reservations. Informal drop-in demonstrations on how to use GPS units will also take place at 3:30 p.m. and 4:30 p.m.

**Traditional geocaching is prohibited on National Wildlife Refuges. The Refuge-sponsored virtual geocaching program is the only geocaching activity allowed on the San Francisco Bay NWR Complex.*

October 11 - 18 is National Wildlife Refuge Week!

1 Marshlands Rd, Fremont, CA
510-792-0222



Autumn Activity Schedule

September

Saturday, September 6

*Cruisin' Towards Restoration

Environmental Education Center, Alviso

9:30 a.m. – 12:00 p.m.

Join us for a rare opportunity to travel by van to some of the remote salt ponds in Alviso. Along the way we'll talk about the changes already happening that will make the South Bay Salt Pond Restoration a reality. The bird migration will also be starting, and we'll have plenty of stops to look for fall bird visitors! PLEASE NOTE: The van cannot accommodate wheelchairs. Participants must be able to maneuver into and out of the van on their own. No bathroom facilities will be available once the van is on the levees. Recommended for ages 12 and over. Space is very limited. RESERVATIONS REQUIRED. Call Jennifer at 408-262-5513 ext. 106.

Sunday, September 7

*Scenes from a Marsh

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

Join us as we step back in time and explore wastewater and sewage treatment around the South Bay during the time of the Ohlone, the Gold Rush, the 1950s, and present day. After a brief introduction to the refuge, we will walk through refuge habitats to learn what the landscape was like during these periods of human history. Afterward, watch a slideshow on how the San Jose/Santa Clara Water Pollution Control Plant cleans our wastewater today, and how you can make a difference in protecting refuge habitats through water conservation. Recommended for ages 10 and up. Reservations required. Call Molly at 408-262-5513, ext. 104.

Saturday, September 13

Shoreline Trail – 8 miles roundtrip

Dumbarton Fishing Pier Parking Lot, Fremont

9:00 a.m.

Meet new people while getting fit and healthy! This is the fifth walk featured in the Refuge Rambler club. This trail near the Dumbarton Fishing Pier is eight miles roundtrip, flat, and level. The walk is self-paced and you may turn back at any time. Hats, water, and sunscreen are strongly recommended. There are no restroom facilities once on the trail. You do not need to be a Refuge Rambler to join this walk. No reservations are needed. A

Let's Go
Outside!

refuge representative will be there to greet you at 9 a.m. For a narrative description of this trail, log on to the Don Edwards web site at <http://www.fws.gov/desfbay>.

Tour the Salt Pond Restoration by Bike

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

How do you restore a salt pond? What does restoration mean? And, oh...by the way...just what is a salt pond? Salt Ponds A16 and A17 will play a starring role in this 5.5-mile bike tour of the South Bay Salt Pond Restoration Project. As we leisurely roll along the levees, we'll discuss the answers to the above questions and more. We'll also have plenty of opportunities to look for feathered visitors stopping by on their way south for the winter. Helmets are required and knobby tires strongly encouraged. Recommended for ages 8 and over. RESERVATIONS REQUIRED. Call Jennifer at 408-262-5513 ext. 106.

A Trip Back in Time

Visitor Center, Fremont

10:30 a.m. – 12:00 p.m.

Revive the vanishing knowledge of the history of the Don Edwards San Francisco Bay National Wildlife Refuge grounds by strolling the trails with docent Ray Studer. Ray spent most of 2004 researching the on-site salt production, railroads, and homes that were located on the refuge grounds until the 1950s. Using a collection of old photographs, the last vestiges of a way of life can be traced back to the 1850s that led to the construction of the town of Newark in 1876.

Family Bird Walk

Visitor Center, Fremont

10:00 a.m. – 12:00 p.m.

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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Exploring the Dunes

Antioch Dunes NWR, Antioch

10:00 a.m. – 11:00 a.m.

Did you know there's a National Wildlife Refuge in Antioch? Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes National Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

Twilight Marsh Walk

Visitor Center, Fremont

6:30 p.m. – 8:00 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. Meet at the observation deck in front of the Visitor Center. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Sunday, September 14

*Drawbridge

Environmental Education Center, Alviso

10:00 a.m. – 12:30 p.m.

There's a ghost town in San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two-fisted rowdies? Find out at this program, led by Ceal Craig. Start with a slide show then take a short minivan excursion to view Drawbridge across Coyote Creek. Program intended for adults. Space is very limited. RESERVATIONS ARE ESSENTIAL. Call Lindy at 408-262-5513 ext. 102. (Note: we do not visit the town itself, we go to the closest spot that one can legally view Drawbridge.)

Saturday, September 20

Coastal Cleanup! Ê

Dumbarton Fishing Pier Parking Lot, Fremont Ê

8:30 a.m. – 12:00 p.m.

Join thousands of people around the world for International Coastal Clean-Up Day. Bring a hat, sturdy shoes, water, sunscreen, and gloves if you have them. Space is limited to 50 people. Children under 18 must have parental approval. For reservations call the Visitor Center at 510-792-0222 ext. 43.

Bike the Levees

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

Join Ed Kantack for an easy 5-mile bike ride along the levees. Get a glimpse of Drawbridge and see a variety of birds. Helmets are required and knobby tires are recommended along with water and sunscreen. Open to all ages. Children under 8 years old must be accompanied by a parent. Space is limited. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

*Beginning Bird Photography Workshop

Environmental Education Center, Alviso

3:00 p.m. – 5:00 p.m.

Come learn the basics in bird photography! Join us for tips on photography or for viewing commonly seen birds at the refuge. This beginning bird photography workshop will help you get the most out of your point and shoot camera. We will discuss ideal sighting and photo taking conditions, lighting, composition and equipment. We will also have a slide show to familiarize you with some common birds at the refuge. Our discussion will be followed by an easy walk to different locations where we will take photos. Please bring your binoculars and/or digital or film camera. Ages 14 and up. Warm clothing and comfortable walking shoes recommended. Space is very limited. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102. Led by Jennifer Woo.

Sunday, September 21

*Bird Adaptation Creations

Environmental Education Center, Alviso

1:30 p.m. – 3:30 p.m.

Have you ever wondered what it would be like to be a bird living at the refuge? Join us as we uncover the

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

Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513 Ê

mysteries of the avian world. Learn about bird adaptations, explore a bird skeleton, and make human-sized bird wings, beaks, and feet to take home. We will also take a short refuge walk to spot some feathered creatures. All ages welcome. Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, September 27

*Alviso Slough Trail - 9-mile loop

Meet by the restrooms in Alviso Marina in Alviso. Directions below.

9:00 a.m.

Meet new people while getting fit and healthy! This is the sixth walk featured in the Refuge Rambler club. This trail is nine miles, flat, and level. The walk is self-paced

Let's Go Outside!

and you may turn back at any time. Hats, water, and sunscreen are strongly recommended. There are no restroom facilities once on the trail. You do not need to be a Refuge Rambler to join this walk.

No reservations are needed. A refuge representative will be there to greet you at 9 a.m. For a narrative description of this trail, log on to the Don Edwards web site at <http://www.fws.gov/desfbay>. Directions: From Hwy 237, exit at Lafayette/Gold St. Head north onto the Gold St. Connector and left onto Gold St. Turn left onto Elizabeth St. and right onto Hope St., which leads straight to the Alviso Marina.

*Salt Pond Restoration 101: An Introduction to the Project

Environmental Education Center, Alviso

11:00 a.m. – 12:00 p.m.

Restoration of 15,100 acres of south San Francisco Bay salt ponds to wetland habitats has begun! Please join us for an overview of this incredible project happening in our backyard. Program will begin indoors but will move outside to a view of the salt ponds. Access to salt pond is via an easy 0.25-mile boardwalk trail. All are welcome!

*Mucky Marsh Stories

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

Come to our education center auditorium to enjoy a story about wildlife followed by a guided exploration outside. Fun for the whole family. Ages 3 and up. Led by teacher/librarian Pat Hartinger. RESERVATIONS REQUIRED. Please call Lindy at 408-262-5513 ext 102.

October

Saturday, October 4

*Salt Pond Discovery Hike

Environmental Education Center, Alviso

9:00 a.m. – 12:30 p.m.

How do you restore a salt pond? What does restoration mean? And, oh...by the way...just what is a salt pond? Salt Ponds A16 and A17 will play a starring role in this 5.5-mile discovery hike of the South Bay Salt Pond Restoration Project. As we enjoy the easy, unpaved trail along the levees, we'll discuss the answers to the above questions and more. We'll also have plenty of opportunities to look for our feathered visitors stopping by on

their way south for the winter. Don't forget to pack a snack, water, and binoculars (if you have them.) Sunscreen and a hat are highly recommended. Due to the distance and time of this hike, it is not recommended for young children. Please call Jennifer at 408-262-5513 ext. 106 for more information.

*NIGHT OF THE LIVING MARSH!

Environmental Education Center, Alviso

6:00 p.m. - 8:30 p.m.

Did you know that the marsh comes alive at night? Join us for a unique opportunity to explore the refuge at twilight. Many marsh creatures are just waking up to start their "day." Find out what critters come out as the sun goes down. Get up close and personal with some of these creatures during our live animal show!! Discover nocturnal animal adaptations through crafts, games, after-dark adventure walks, face painting, and much, much more! Dress warmly, and bring a flashlight. Fun for the whole family! Don't miss this annual event! No reservations needed.

Webelos Naturalist Program

Visitor Center, Fremont

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. Space is limited to 15 Webelos. Call 510-792-0222, ext. 43. Led by June Smith.

Sunday, October 5

Mud Marsh Mania

Environmental Education Center, Alviso

1:00 p.m. – 3:00 p.m.

What's that wiggling and squiggling? Think that brown stuff is just mud? Think again! Come take a slough hike, collect some ooey, goeey mud, and discover which critters the birds find during a low-tide feast. We will compare mud creatures from two different mud flat habitats. Through this comparison, we will discover how these creatures are species indicators of slough habitat. All ages welcome. Reservations required. Call Molly at 408-262-5513, ext.104.

October 8-11 is National Wildlife Refuge Week!

Saturday, October 11

Connections to Pier Fishing

Dumbarton Fishing Pier, Fremont

8:00 a.m. – 12:00 p.m.

Have you ever wanted to try fishing but didn't know how to begin? Learn the fundamental basics of catch and release fishing at the Dumbarton fishing pier! Discover the types of wildlife living in the San Francisco Bay, learn the safety and ethics of fishing, and then try your luck on the pier with our fishing poles. All participants receive free box with tackle. No fishing license needed! Space is limited to the first 50 people. You must arrive at 8 a.m. to participate. RESERVATIONS REQUIRED. Call the Visitor Center at 510-792-0222 ext. 43.

Autumn Activity Schedule

Exploring the Dunes

Antioch Dunes NWR, Antioch

10:00 a.m. – 11:00 a.m.

Did you know there's a National Wildlife Refuge in Antioch? Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes National Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

Drawbridge

Environmental Education Center, Alviso

10:00 a.m. – 12:30 p.m.

There's a ghost town in San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two-fisted rowdies? Find out at this program led by Ceal Craig. Start with a slide show then take a short mini-van excursion to view Drawbridge across Coyote Creek. Program intended for adults. Space is very limited. RESERVATIONS ARE ESSENTIAL. Call Lindy at 408-262-5513 ext. 102. (Note: we do not visit the town itself, we go to the closest spot that one can legally view Drawbridge.)

*Cruisin' Towards Restoration

Environmental Education Center, Alviso

1:00 p.m. – 3:30 p.m.

Join us for a rare opportunity to travel by van to some of the remote salt ponds in Alviso. Along the way we'll talk about the changes already happening that will make the South Bay Salt Pond Restoration a reality. The biannual bird migration will also be in full swing and we'll have plenty of stops to look for our fall bird visitors! PLEASE NOTE: The van cannot accommodate wheelchairs. Participants must be able to maneuver into and out of the van on their own. No bathroom facilities will be available once the van is on the levees. Recommended for ages 12 and over. Space is very limited. RESERVATIONS REQUIRED. Call Jennifer at 408-262-5513 ext. 106.

*Just for Tots: October Discoveries

Environmental Education Center, Alviso

2:00 p.m. - 3:30 p.m.

Come explore the refuge and learn about the creatures that live in it! Introduce your wee folk, ages 3-6, to the unique marsh habitat through interactive, hands-on activities. They will experience the marsh firsthand with a craft and a short walk. Children must be accompanied by an adult. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

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

Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513 Ê

Autumn Activity Schedule

Sunday, October 12

*Critter Café

Environmental Education Center, Alviso
10:30 a.m. – 12:00 p.m.

Water is pretty boring stuff right? No way! Take a closer look at some of the tiny, squiggly, and wiggly creatures we'll find in a San Francisco Bay slough. Learn about macro invertebrates and plankton-- the tasty treats that shorebirds are eating at our 5-star marsh cafes at the refuge, followed by a guided exploration outside. Discover how you are connected to this thriving habitat and how you can protect it. Ages 5 and up. RESERVATIONS REQUIRED. Call Lindy at 262-5513 ext 102.

Community Service

Environmental Education Center, Alviso
2:00 p.m. – 4:00 p.m.

Do you need to fulfill community service requirements or would you just like to come lend a hand? Come help remove invasive non-native plants from our chemical-free demonstration gardens. Bring your own gloves or borrow a pair of ours. Tools provided. Dress in layers. Long pants are recommended. Be prepared to get dirty and wet. Ages 9 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Saturday, October 18

A Trip Back in Time

Visitor Center, Fremont
10:30 a.m. – 12:00 p.m.

Revive the vanishing knowledge of the history of the Don Edwards San Francisco Bay National Wildlife Refuge grounds by strolling the trails with docent Ray Studer. Ray spent most of 2004 researching the on-site salt production, railroads, and homes that were located on the refuge grounds until the 1950s. Using a collection of old photographs, the last vestiges of a way of life can be traced back to the 1850s that led to the construction of the town of Newark in 1876.

*ABC's of Raptors

Environmental Education Center, Alviso
1:30 p.m. – 3:30 p.m.

It's a falcon, or is it? It could be an accipiter or a buteo. Perhaps it's a kite. But what if it's a vulture or an owl? Learn the difference as we explore birds of prey we call raptors! Suitable for ages 7 and up. Led by Ed Kantack. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Open House

Newark Slough Learning Center, Fremont
(Down the Hill from the Visitor Center)
1:00 p.m. – 5:30 p.m.

Experience the outdoors at the San Francisco Bay National Wildlife Refuge Complex Headquarters in Fremont through guided walks, workshops, and demonstrations. Join in on an informal hike through the refuge habitats. Practice your duck identification skills or learn all about geocaching in a 2-hour class and demonstration sponsored by REI Outdoor School. Take your picture with the Blue Goose. For a complete schedule and times, log on to our web site at <http://www.fws.gov/sfbayrefuges> beginning in September.

Native Plant Sale

Newark Slough Learning Center, Fremont
(Down the Hill from the Visitor Center)
1:00 p.m. – 4:00 p.m.

This is your chance to purchase that perfect native plant to add to your garden! Whether you're looking to re-landscape your yard with drought-resistant plants, or you want to create habitat for neighborhood birds and butterflies, this is the place to be. Follow the signs to the sale.

LaRiviere Marsh/Tidelands Trail – 2 miles roundtrip

Meet at the LaRiviere Marsh Parking Lot off Marshlands Rd. Directions below.
1:00 p.m.

Meet new people while getting fit and healthy! This is the seventh and last walk featured in the Refuge Rambler club. If you've completed six or seven walks in the series, congratulations! Be sure to bring your passport to the refuge information table for your free All-Star T-shirt and certificate! This trail is two miles.

The walk is self-paced and you may turn back at any time. Hats, water, and sunscreen are strongly recommended. You do not need to be a Refuge Rambler to join this walk. No reservations are needed. A refuge representative will be there to greet you at 1:00 p.m. For a narrative description of this trail, log on to the Don Edwards web site at <http://www.fws.gov/desfbay>. Directions: Drive toward the Visitor Center on 1 Marshlands Road, Fremont. Turn right into the first parking lot you see. If you reach the stop sign, you've gone too far.

Introduction to Geocaching

Newark Slough Learning Center, Fremont
(Down the hill from the Visitor Center)
1:00 p.m. – 3:00 p.m.

The San Francisco Bay National Wildlife Refuge Complex and REI Outdoor School team up to bring an Introduction to Geocaching class to the refuge during National Wildlife Refuge Week. Learn how to use a Global Positioning System (GPS) unit and the latest trends in geocaching, a high-tech method of treasure hunting. REI will have a limited number of units for you to borrow and to practice. Then stop by the refuge information table and learn about the refuge's new virtual geocaching program! Space is limited! Call the Visitor Center at 510-792-0222 ext. 43 for reservations. Can't get into the class? Drop by the informal REI GPS demonstration at 3:30 and 4:30 p.m. Please note: Traditional geocaching is prohibited on National Wildlife

Refuges. The refuge-sponsored virtual geocaching program is the only geocaching activity allowed on the San Francisco Bay National Wildlife Refuge Complex.

Family Bird Walk

Newark Slough Learning Center, Fremont
(Down the hill from the Visitor Center)
1:30 p.m. - 3:00 p.m.

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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Recommended for children ages 5-10.

Beginning Bird Photography Workshop

Newark Slough Learning Center, Fremont
(Down the Hill from the Visitor Center)
3:30 p.m. - 5:30 p.m.

Come learn the basics in bird photography! Join us for tips on photography or for viewing commonly seen birds at the refuge. This beginning bird photography workshop will help you get the most out of your point-and-shoot camera. We will discuss ideal sighting and photo taking conditions, lighting, composition and equipment. We will also have a slide show to familiarize you with some common birds at the refuge. Our discussion will be followed by an easy walk to different locations where we will take photos. Please bring your binoculars and/or digital or film camera. Recommended for ages 14 and up. Warm clothing and comfortable walking shoes recommended. Led by Jennifer Woo.

Twilight Marsh Walk

Visitor Center, Fremont
5:30 p.m. – 7:00 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. Meet at the observation deck in front of the Visitor Center. Not suitable for young children. Led by Mary and Gene Bobik.

Sunday, October 19

Halloween Slough Whoo?

Environmental Education Center, Alviso
10:00 a.m. – 12:00 p.m.

Whoo...whoo...whoo did that owl eat? Bet you can find out! Come celebrate Halloween early and solve the mystery of who ate whom by learning about these nocturnal predators. We will debunk owl myths with a slide show presentation, followed by a hike through the refuge habitats in which owls live. We will search for owl clues and dissect owl pellets to discover exactly who the owl ate! Recommended for ages 7 and up. Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, October 25

* Wildlife Detectives:

Making Tracks

Environmental Education Center, Alviso
10:30 a.m. – 12:00 p.m.

Do you enjoy putting together clues to solve a mystery? Always wanted to know what creatures lurk in your area? Then come to the refuge and enhance your detec-

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

Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513 Ê

tive skills. Learn to identify animal tracks and make your very own to take home. Ages 7 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Salt Pond Restoration 101: An Introduction to the Project Environmental Education Center, Alviso 11:00 a.m. – 12:00 p.m.

Restoration of 15,100 acres of south San Francisco Bay salt ponds to wetland habitats has begun! Please join us for an overview of this incredible project happening in our backyard. Program will begin indoors but will move outside to a view of the salt ponds. Access to salt pond is via an easy 0.25-mile boardwalk trail. All are welcome!

All About Owls Visitor Center, Fremont 1:00 p.m. – 3:00 p.m.

Owls have captivated human imagination for centuries. Curious about how they hunt, how they see and hear, and what they eat? Come listen to a presentation, view owl body parts, listen to their calls, and dissect owl pellets to see what they eat. Recommended for ages 7 and up. Led by Paul Bridges. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

November

Saturday, November 1

Webelos Naturalist Program Visitor Center, Fremont 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. Space is limited to 15 Webelos. Call 510-792-0222. Led by June Smith.

Sunday, November 2

***Water Wizards** Environmental Education Center, Alviso 2:00 p.m. – 3:30 p.m.

Are you curious about what water is made of, where it comes from, and why it is so important to us and the habitats around San Francisco Bay? Ever wondered where water goes after we flush, shower, and clean the dishes? If so, come along as we investigate these topics and learn how we can each be water wizards in our own lives to help keep ourselves and refuge habitats healthy. After a brief slide show, we will take an easy hike through the refuge. Recommended for ages 9 and up. Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, November 8

Exploring the Dunes Antioch Dunes NWR, Antioch 10:00 a.m. – 11:00 a.m.

Did you know there's a National Wildlife Refuge in Antioch? Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes Na-

tional Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

Family Bird Walk Visitor Center, Fremont 10:00 a.m. – 12:00 p.m.

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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

***Discover Ohlone Uses of Plants** Environmental Education Center, Alviso 1:30 p.m. – 3:00 p.m.

Explore the plants that were traditionally used by the original inhabitants of this area, the Ohlone. Then enjoy a guided walk in our native plant garden. Fun for the whole family. Recommended for ages 7 and up. Led by teacher/librarian Pat Hartinger. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Saturday, November 15

***All About Owls** Environmental Education Center, Alviso 10:30 a.m. – 12:30 p.m.

Owls have captivated human imagination for centuries. Curious about how they hunt, how they see and hear, and what they eat? Come listen to a presentation, view owl body parts, listen to their calls, and dissect owl pellets to see what they eat. Recommended for ages 7 and up. Led by Paul Bridges. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

***Water Water Everywhere** Environmental Education Center, Alviso 1:30 p.m. – 3:00 p.m.

Where does the water come from and where does it go? Learn about the water cycle and watersheds. Build a model of a watershed and see if you can predict where the water will go. Recommended for ages 7 and up. Led by Ed Kantack. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Community Service Environmental Education Center, Alviso 2:00 p.m. – 4:00 p.m.

Do you need to fulfill community service requirements or would you just like to come lend a hand? Come help remove invasive non-native plants from our chemical-free demonstration gardens. Bring your own gloves or borrow a pair of ours. Tools provided. Dress in layers. Long pants are recommended. Be prepared to get dirty and wet. Ages 9 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

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

Autumn Activity Schedule

of the refuge as night descends. Meet at the observation deck in front of the Visitor Center. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Sunday, November 16

Habitat Hike Environmental Education Center, Alviso 10:00 a.m. – 12:00 p.m.

Do you enjoy exploring nature? Are you curious about where mice sleep or how birds stay dry in the rain? If so, then come take a walk and explore the habitats at the refuge. Along the way we will learn about wetland and upland habitats that have been altered by human activities. We will observe and identify plants, birds, and whatever other animals we encounter on this short and easy trek. Recommended for all ages. Reservations required. Call Molly at 408-262-5513, ext.104.

Saturday, November 22

***Discover Native Plants** Environmental Education Center, Alviso 10:30 a.m. – 12:00 p.m.

Want to know more about native plants? Come learn all about them with a guided exploration through our native plant demonstration garden. Take a look at some good plants for Bay Area gardens that attract wildlife, add beauty to your garden, and do not require much water. Led by June Smith. Program is geared for adults, but all ages welcome. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Salt Pond Restoration 101: An Introduction to the Project Environmental Education Center, Alviso 11:00 a.m. – 12:00 p.m.

Restoration of 15,100 acres of south San Francisco Bay salt ponds to wetland habitats has begun! Please join us for an overview of this incredible project happening in our backyard. Program will be held indoors in the auditorium. All are welcome!

Sunday, November 23

Introduction to Ducks Visitor Center, Fremont 10:00 a.m. – 11:30 a.m.

Thousands of ducks winter in the San Francisco Bay every year. View a short slide show 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. Led by Carmen Minch.

Field Trips to the Refuge

General Field Trip Program Information

FREE field trip programs are offered at two sites at the Don Edwards San Francisco Bay National Wildlife Refuge. The Wetland Round-Up field trip program is offered at the Newark Slough Learning Center in Fremont. Wetland Round-Up and Slow the Flow 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 students. All programs have been correlated to the appropriate State of California Education

Standards.

Educators and adult leaders design and conduct their own field trips after attending a Field Trip Orientation Workshop. Adult volunteers must be recruited to lead the activities at the different learning stations and to chaperone the rotation of student groups. We provide easy to follow “scripts” for each station, but both “leaders” and “chaperones” are strongly encouraged to attend a workshop. It is our policy that lead educators must attend a workshop 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 the creatures of the mud flats, collect plankton from the slough, and taste the pickleweed from the salt marsh. This program is designed for grades K-6, for up to 65 students. Wetland Round-Up in Fremont is offered Tuesday - Friday from October 1 - December 12, 2008.

Reservations for Fall field trips begin on Tuesday, September 9th, 2008 between 4:00 p.m. and 5:00 p.m. Call 510-792-0222 ext. 0 on this date to reserve a Fall field trip.

For more information or to schedule a field trip after September 9, call the Environmental Education Intern at 510-792-0222 ext. 42 or Tia Glagolev at ext. 36.

Please note that reservations for Spring 2009 will begin on Tuesday, December 2 from 4:00 p.m. - 5:00 p.m.

Field Trip Orientation Workshop Dates at the Learning Center in Fremont

All Orientations are from 4:00 p.m. - 7:30 p.m.

Thursday, September 25

Thursday, October 16

Wednesday, November 5

Call the Environmental Education Intern at 510-792-0222 ext. 42 to attend an orientation.

Limited opportunities are available for Service Learning projects with your class this fall. Contact Tia Glagolev at 510-792-0222, ext. 36 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 program is designed for up to 65 students in grades K-6. Wetland Round-Up in Alviso is

offered Monday - Thursday from October 20- December 11, 2008.

Reservations for Fall field trips begin on Tuesday, September 9, 2008 between 4:00 p.m. and 5:00 p.m. Call 408-262-5513 on this date to reserve a Fall field trip. For more information or to schedule a field trip after September 9, call the Environmental Education Intern at 408-262-5513 ext. 103 or Genie Moore at ext. 100.

Please note that reservations for Spring 2009 will begin on Tuesday, December 2 from 4:00 p.m. - 5:00 p.m.

For more information or to schedule a field trip after September 9, call the Environmental Education Intern at 408-262-5513 ext. 103.

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

All Orientations are from 4:00 p.m. - 7:30 p.m.

Wednesday, October 8

Wednesday, October 29

Thursday, November 13

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 geared for 5th - 12th grades, although a modified field trip is available for college groups. Educators are encouraged to contact us to discuss options for customizing field trips and presentation activities and schedules. Slow the Flow Programs are available throughout the year in Alviso. **Reservations for the Slow the Flow program are on a first-come basis.** Call Molly Ward at 408-262-5513 ext. 104 for more information, or to schedule a field trip or presentation.

Scout Programs

Offered by the Watershed Watchers Program

The Environmental Education Center currently offers free hands-on, small group programs for Scouts. In these programs Scouts learn about endangered species, migratory birds, wetland habitats, and the



relationship between personal habits and their effects on the Bay. The programs are sponsored by the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Francisco Bay Wildlife Society and are hosted by the Don Edwards San Francisco Bay National Wildlife Refuge.

We offer three specific Scout Programs that meet the badge/patch requirements. The Scout programs offered are:

Webelos Naturalist Badge

Saturday, November 22, 2008
2 p.m. - 4 p.m.

Saturday, December 6, 2008
10:30 p.m. - 12:30 p.m.

Brownie Eco-Explorer Patch

Saturday, October 25, 2008
2 p.m. - 4 p.m.

Junior Girl Scout Wildlife Badge

Saturday, November 22, 2008
10 a.m. - 12 p.m.

RESERVATIONS ARE REQUIRED.

Programs fill up quickly. Reservations for fall Scout programs begin on **Thursday, October 9 between 3 p.m. – 4 p.m.** To make a reservation or for more information please call Lindy at 408-262-5513 ext 102.

Note: Ratio of 1 adult per 5 children required. Space is limited to 20 people, including siblings (no siblings under 5-years old). Once the program is full there will be a waiting list. Most programs are scheduled on Saturdays, approximately two hours in length, and cover almost all of the badge/patch requirements. Weekday programs are offered in the summer and during school holidays.

Scouts are also invited to make reservations for other weekend programs that may be suitable for their badge/patch needs. Please see the individual program description for more information and who to contact for a reservation. Other programs offered that may meet badge requirements include Community Service, Habitat Hike, Special Events, Owl Programs, Butterfly Programs, Mud and Critter Programs, and Cleanups.

TIDELINE

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

Volume 29, Number 3

Editor: Carmen Minch

To receive *Tideline*, email carmen_jeong-minch@fws.gov, or write to: **Tideline**, Don Edwards San Francisco Bay National Wildlife Refuge, 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 exist 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

Don Edwards Warm Springs Unit Manager: Ivette Loreda

Don Edwards Refuge Wildlife Specialist: Eric Mruz

Farallon Refuge Wildlife Specialist: Zach Coffman

North Bay Refuges Manager: Christy Smith

North Bay Wildlife Specialist: Louis Terrazas

South Bay Refuges Manager: Diane Kodama

Refuge Planner: Winnie Chan

Chief of Visitor Services: Karla Tanner

Outdoor Recreation Planners: Carmen Minch, Jennifer Heroux

Volunteer Coordinator: Paul Mueller

Environmental Education Specialists: Genie Moore, Tia Glagolev

Law Enforcement Officers: Walter Duran, Kevin Watts

Biologists: Joy Albertson, Giselle Downard, Rachel Hurt, Gerry McChesney, Susan Euing, Peter Kappes, Cheryl Strong

Administrative Staff: Lucinda Ballard, Ellen Tong, Patricia Compton, Lauren Hupp

Maintenance Staff: Juan Flores, James Griffin, Calvin Sahara, Michael Springman, Jeff White, and Norman Winkler

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: Christopher Kitting

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Treasurer: Bart Anderson

Secretary: Ceal Craig

Directors: Cheryl Davis, Sue Ten Eyck, David Reinsche, Terry Smith, and Varon Smith

Staff

Interpretive Specialist: Lindy Nice

Education Specialist: Molly Ward

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

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 U.S. Fish & Wildlife Service
 Permit No. G-77

SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE COMPLEX

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

Headquarters & Visitor Center

(510) 792-0222

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 Marshlands Road to the stop sign. Turn left into the parking lot.

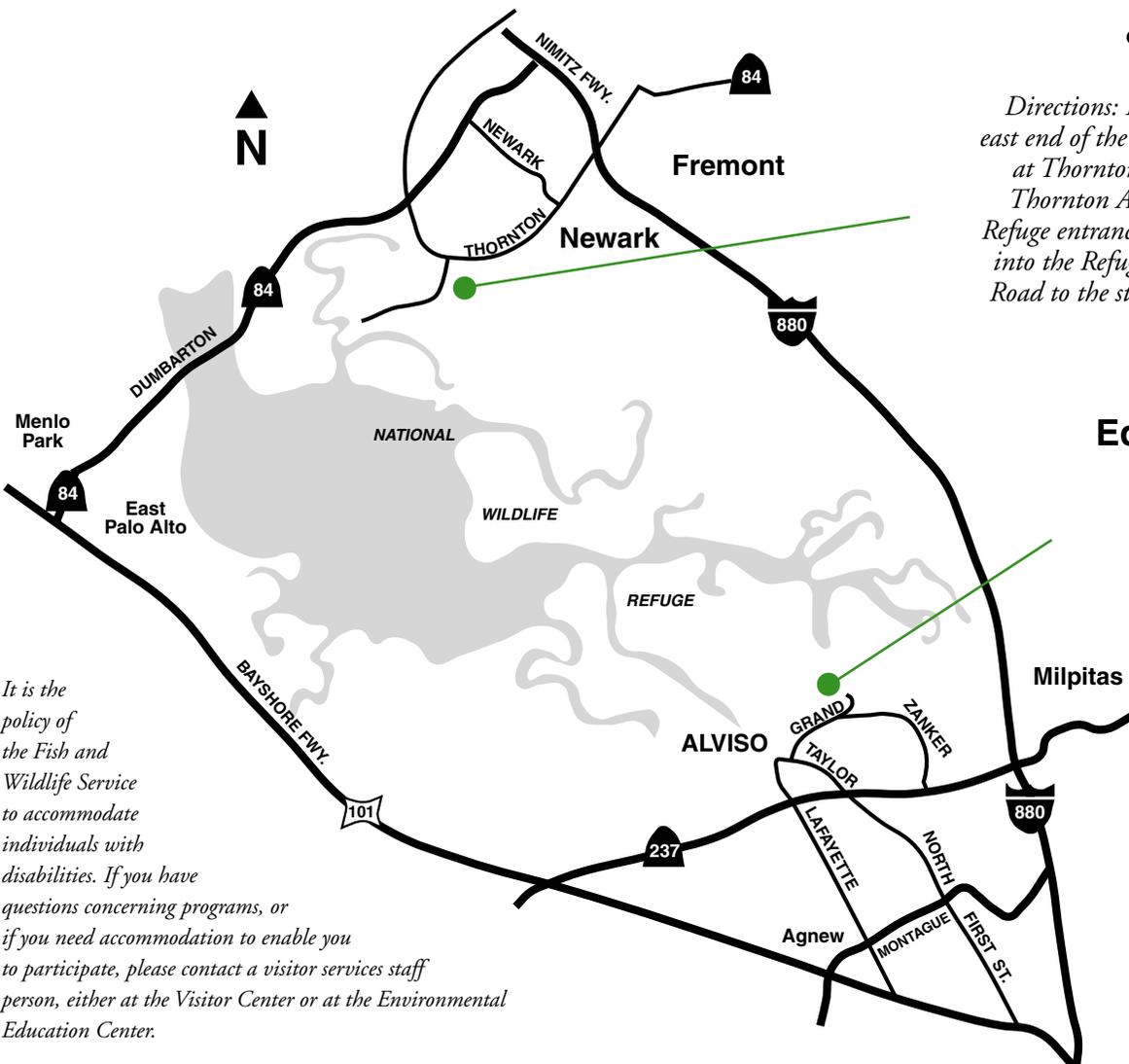
Environmental Education Center

(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.