

SUMMER 2008

Volume 29, Number 2

Tideline



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

TRACES

by *Cris Benton*

Some of my favorite moments occur while arriving in the Bay Area. On approach to SFO, a glance out of the airline window finds the South Bay's patchwork of vivid salt evaporation ponds. These ponds support a five-year-long process of solar evaporation that yields 600,000 tons of salt a year. As San Francisco Bay water makes the trip from 3% to 30% salinity it evolves through a succession of bright colors, evidence of halophilic algae, bacteria, and other organisms that thrive at specific elevated salinities. These tiny creatures paint our day's version of what has been a remarkably transitional landscape.

The salt evaporation impoundments cover what was once a vast marshland. In the mid-19th Century small "mom & pop" salt operations were established alongside a scattering of 'landings' placed along the major creeks as they met the Bay. The landings, with names that linger on contemporary maps, served the important function of connecting East Bay agriculture and the growing market of San Francisco. As the Bay Area railway network expanded, local shipping waned in importance.

The South Bay was reshaped in 1880 by the construction of the Southern Pacific Coast rail line connecting Newark and Alviso. Thirty years later the Bay gained its first bridge on the Dumbarton Cutoff rail line connecting Hayward and San Mateo. Transitions continued as the development of highways and trucking lessened the importance of the rail lines.

Meanwhile, the salt ponds changed as small operations were subsumed by



The ruins of a landing on what was once the bank of Beard's Creek (September 2006)

several waves of corporate consolidation. In recent times one company, the Cargill Corporation, owned the salt-making rights to all 100,000 acres of San Francisco Bay salt ponds. In 2003, Cargill sold 16,500 acres of salt ponds and salt-making rights to a coalition of non-profit and government agencies. These wetlands will be managed for the public good with an emphasis on wildlife habitat, flood control, and recreation. In this new transition some of the ponds are destined to become tidal marshland again.

As a photographer, I was first drawn to the South Bay by the geometry and colors of the evaporation ponds. For several years I have been taking photographs from

kite-lofted cameras. Among the joys of kite aerial photography (KAP) are the opportunities for invention, the physical challenge of positioning kite and rig, the unusual 'once removed' aspect of composition in absentia, contact with a fine group of KAP colleagues, and the distinct pleasure of messing around with kites. Because flying kites is not allowed on National Wildlife Refuges, I needed to first secure a Special Use Permit prior to photographing on the Don Edwards SF Bay NWR.

Kite aerial photography is a delightful technique for documenting the South Bay. While standing in that flat landscape the

continued next page



This swing bridge carried rail traffic on the Dumbarton Cutoff line across Fremont Slough (November 2006)

Trail, just south of the Dumbarton Fishing Pier. I have not found anything written about this landing, its years of operation, or even its name.

The Dumbarton Cutoff Bridge (37.513326°N, -122.082162°W) – Built in 1910, the Dumbarton Cutoff line features swing bridges at the Newark Slough and the Bay proper. It is clearly visible from the Dumbarton Fishing Pier and from the South Shoreline Trail. This rail line was used for freight except for a brief period carrying passengers around 1920. Decommissioned in 1982, the line is now overgrown with weeds and the bridges are welded in an open position. There are plans underway to reestablish this line as a commuter link between Hayward and San Mateo.

Red Hill Quarry (37.538002°N, -122.077760°W) – Just a stone's throw to the north of today's Dumbarton Bridge Toll Plaza lies what some believe is the deepest place in the United States. An examination of early aerial photographs shows that the site of the Red Hill Gravel Quarry experienced minor quarrying before operations ramped up in the 1970s. At that time the site was indeed a hill, rising some 150 feet above the plateau of salt ponds at sea level. As the years rolled by excavation continued until the hill disappeared, replaced by an open pit. The pit grew deeper and deeper



Panorama of the Red Hill Gravel Quarry with Arden Salt Works site in the distance (February 2008)

from page 1

visual experience of the ponds is dominated by sky reflection on the water. Lofting a camera allows a view straight down and this eliminates most sky reflection to reveal the color of the ponds and, in ways I had not anticipated, traces from previous epochs in the landscape. Documenting these traces will allow historians, hydrologists, and researchers to map and record changes to the landscape over time.

My curiosity about the South Bay landscape became more focused when I met Dr. Wayne Lanier, a microbiologist who was working on a project entitled 'Hiking with a Field Microscope.' Wayne and I started hiking in the South Bay to take photographs at our peculiar scales - me from a kite and Wayne through the microscope. The collaboration evolved into the Hidden Ecologies project under the aegis of San Francisco's Exploratorium. The project is exploring methods to look at places in ways that juxtapose scales, collect different points of view, and encourage the sharing of ideas.

As Wayne and I looked at the South Bay an iterative process evolved. Time and time again, our hikes and associated aerial photographs revealed puzzling aspects of the landscape. We would then conduct a phase of armchair exploration using tools that have become publicly available in the last few years. With a personal computer

you can now easily access high-resolution versions of the 1858 US Coastal Survey T-Sheets, the 1878 Thompson & West Alameda County Atlas, 1928 aerial photographs of the South Bay, contemporary aerial photographs and more (links at end). Searching the cartobibliographic sources would answer some questions and raise others. So, it is back to the field to gather more data, and raise more questions. Here are some examples.

Points of interest

Landing at Dumbarton Point (37.512074°N, -122.107105°W) – At the eastern anchorage of the Dumbarton Highway bridges rest the ruins of an old landing. These old pilings and docks protrude into what is now a salt pond. This is perhaps one of the best-preserved landings in the South Bay and feels out of place on the edge of a shallow salt pond. However, a look back at the 1858 Coastal Survey shows that the location was once a marsh channel, labeled Beard's Creek, and that it was the major outlet of what is now called Fremont Slough. A 1931 map, based on aerial photographs, reveals that this was once the site of a smaller salt operation and, interestingly, that a railroad spur once branched from the Dumbarton Cutoff line, traveled over the Hetch Hetchy water pipeline on a bridge and terminated at the landing. The ruins may be viewed from the South Shoreline

finally reaching 300 feet below sea level by the time operations ceased just a year ago. There are now plans to convert the pit into a recreational area with a deep lake. Recent earth work around the pit, visible on the adjacent hillside, seems to be sculpting a plateau. I am curious about the eventual design for this park and the source of water that will sustain the eventual lake.

Arden Salt Works #1 / La Riviere Marsh (37.532874°N, -122.069501°W) – Just east of the Don Edwards Refuge Headquarters lies a flat plain with levees and a variety of associated artifacts. This area, on the landward side of the southernmost Coyote Hills, was originally a wetland adjacent to Jarvis Landing (previously known as Russian Landing, Beard's Landing, and Mayhew's Landing). The plain was then developed as Arden Salt Works #1, a tidy complex of salt evaporation and crystallization ponds. Today, the area is returning to natural habitat as the LaRiviere Marsh restoration site.

Adjacent to the Don Edwards Refuge

outdoor classroom, is a small wooden pump house built with attention to architectural detail. I was long puzzled about the role of this pump house. It was clearly part of the salt works but what did it pump to? The story was revealed in a series of aerial photographs that show two-foot-diameter pipes made of redwood that lead from the pump house to a crescent-shaped distribution basin with large gate structures on the Arden Salt Works site. This route required a tunnel through the intervening saddle in the Coyote Hills. I believe salt ponds to the north and west of the Coyote Hills fed the pump house but I have not found documentation on this.

Once a great estuary, the South Bay was shaped locally by maritime transportation then railroads and now our highways. More significantly, the entire fabric of the wetlands was transformed through interventions for salt extraction. The area's transitions continue with the ambitious South Bay Salt Pond Restoration Project and its focus on wildlife habitat, recreation, and

flood control.

If you know details about the sites I have listed or others related to the South Bay's cultural past I would be delighted to hear about it. I am particularly interested in old photographs and maps that illuminate patterns in the landscape that we encounter today. To view a list of resources on the internet, log on to http://www.fws.gov/desfbay/KAP_links.htm

Charles C. Benton is a Professor of Architecture and former department chair at UC Berkeley. With principal academic interests lying in the Building Science area, he is engaged in the Building Science Laboratory for teaching and research as well as a longstanding program of post-occupancy case studies. Benton harbors considerable passion for Kite Aerial Photography (KAP) and its associated historical, applied, and artistic dimensions. Benton began his South Bay work during a sabbatical year spent as Artist in Residence at the Exploratorium in San Francisco where he worked on several KAP-related projects.

Science to address key questions

After five years of planning, the South Bay Salt Pond Restoration Project is moving into the implementation phase. This summer, those traveling over the Dumbarton Bridge may see a flurry of activity in the former salt pond known as SF2, located on the west side of the bay just south of Highway 84. Large water control structures will be installed to allow tidal flow into the 240-acre pond for the first time in many decades. Controlling water flow is key to restoration of the pond. In addition, a variety of small islands will be constructed in the pond to provide nesting and roosting habitat for shorebirds.

We know that changing salt ponds alters their ecology. We also know that nature won't respond exactly how we predict so scientists will be paying close attention to the changes through observation, measuring, mapping and modeling. By adapting our management strategies based on science we will keep the restoration project on track.

This small project is an important first step in determining how the entire 15,100-



Refuge Reflections

by Mendel Stewart

acre project might be implemented. The Restoration Project's overarching goal is "the restoration and enhancement of wetlands in the South San Francisco Bay while providing for flood management and wildlife-oriented public access." The goal is to create a mix of tidal and managed habitats on the former industrial salt ponds purchased from Cargill, Inc. in 2003.

The success of the Restoration Project will depend upon scientists' ability to find answers to key questions such as how mercury and other contaminants, or dissolved oxygen will affect the restoration process. As understanding evolves, challenges and uncertainties are inevitable, expected even.

One of the most important key questions involves the response of wildlife, particularly birds. As we restore ponds to tidal marsh as we hope to do over the next 50 years, there may be impacts to those shorebirds with an affinity for saline ponds such as American avocets, black-necked

stilts and threatened Western snowy plovers.

The United States Geological Survey, our sister agency in the Department of the Interior whose mission is to conduct unbiased, scientific research is an important partner in helping us answer some of these key questions. Their monitoring will help us understand the response of wildlife to restoration efforts.

Thus all eyes will be on SF2. Its successful restoration is the first step in the process which will eventually convert over 15,000 acres of existing salt ponds to a mix of wetland habitat, including tidal marsh so desperately needed by the endangered salt marsh harvest mouse and the endangered California clapper rail.

To learn more about the science involved in the South Bay Salt Pond Restoration Project, log on to www.southbayrestoration.org/index.html and click on "Science".

Let's Go Outside: The benefits of outdoor spaces

John Muir, one of our country's foremost conservationists, spent most of his life advocating the preservation of wilderness. He, among other great thinkers and writers, recognized not only the intrinsic value of wild places, but also the benefits they provide for the human mind and body. He believed nature can play an important role in teaching life-long lessons about ourselves

play in the outdoors are physically more active because outdoor spaces are usually more varied and less structured than indoor spaces. Being outside also sets the stage for childhood "discoveries" of the natural world which have more lasting impressions than learning about nature in a classroom. Children are more likely to develop a sense of place and a sense of imagination. And

directions after being outside.

Although the focus here is children, adults benefit from natural settings as well. Howard Frumkin, M.D., the director of the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry at the U.S. Centers for Disease Control and Prevention, has found evidence that healthy adults who partake in wilderness experiences such as hiking, fishing, and camping make healthier lifestyle choices. Similar activities are often used to relieve psychological disorders and developmental disabilities. Other studies show that those who exercise outside where there are trees and grass are often less stressed and depressed than those who exercise inside a gym. It would appear that spending time outside is beneficial to everyone.

Everybody needs beauty as well as bread, places to play and pray in, where Nature may heal and cheer and give strength to body and soul alike.

John Muir

and the world we live in.

Although many adults may not be able to articulate how nature, or the outdoors, shaped them developmentally, or helped create their value system, most adults will tell you that as a child, they played outside - in the woods, a creek, a backyard, or an empty lot.

Can younger adults, teens, and children say the same? Something began to change during the last 30 years. The once common sight of kids playing makeshift games outside shifted to kids playing indoors. Competition with media, perceived dangers of strangers, and lack of available outdoor spaces all contributed to this gradual change in our culture. This shift away from outdoor play and subsequent disconnect from nature may have consequences for our children's health as well as for the future of conservation.

Studies have shown that playing in the outdoors has helped children physically and psychologically. For instance, recreating outside may help combat the rising epidemic of childhood obesity. Those who



finally, children taking part in a week-long, residential outdoor recreation program were found to have increased confidence and self esteem.

In addition to the benefits of physical activity, a recent study conducted by the University of Illinois discovered that children with Attention-Deficit Hyperactivity Disorder (ADHD) have fewer symptoms after playing in the outdoors than when they focus on indoor play activities such as television or video games. This study also found ADHD kids were better able to concentrate, complete tasks, and follow

In response to the rising evidence which shows how many health benefits the outdoors provides, The U.S. Fish and Wildlife Service has launched a campaign to get kids outdoors and have fun. Check out the People and Nature website at <http://www.fws.gov/children/index> for more information. The California Roundtable on Recreation, Parks and Tourism has also developed the California Children's Outdoor Bill of Rights. The Children's Outdoor Bill of Rights list 10 activities that each child should have the opportunity to experience before entering high school. These rights were endorsed by Governor Arnold Schwarzenegger in 2007. Log on to <http://calroundtable.org/cobor.htm> to see this list. And, as always, you are invited to join us for one of the weekend activities listed in *Tideline*.

So what are you waiting for? Let's go outside!

Other links:

<http://www.cincbayarea.org>

<http://www.cnaturenet.org>

<http://www.childrensnatureinstitute.org>

<http://www.greenhour.org>

<http://www.nochildleftinside.org>



Let's Go Outside!

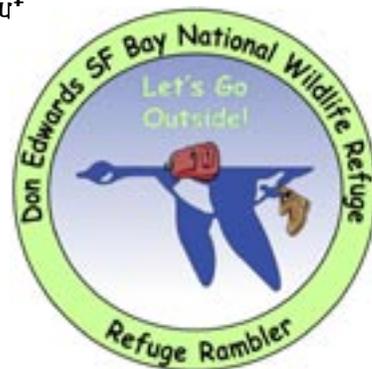
Be a Refuge Rambler



The Don Edwards San Francisco Bay National Wildlife Refuge has a fun new way to explore the Refuge, meet new people, and to get healthy. Become a Refuge Rambler! One to two times a month from June to October, members of the Refuge Rambler club will gather at designated times and locations on the Don Edwards Refuge to walk the trails together. A Refuge staff or volunteer will be present to greet the group, check off trail passports and walk the trail. These walks will range from 2-9 miles and will be located in Fremont, Alviso, Menlo Park and Mountain View. These walks are self-paced. Take your time to enjoy the outdoors, discover nature, and meet fellow nature-lovers. People of all ages are welcome.

Becoming a Refuge Rambler is easy and free. You are under no obligation! Complete the registration form below, or download the form on the refuge web site at <http://www.fws.gov/desfbay>. Mail it to Carmen Minch, 9500 Thornton Ave, Newark, CA 94560. In a couple of weeks, you will receive a Refuge Rambler patch, a trail passport, a schedule, and a description of the trails featured for 2008.

The trail passport helps keep track of all the trails you completed. The refuge staff/volunteer will place a sticker in your passport for each trail walk you attend. If you complete 6 out of the 7 trails featured, you become a Refuge Rambler All-Star! Submit your passport in person at the Refuge Open House on October 18 and receive your All-Star t-shirt. Or, you can mail your passport to the refuge by October 31 and the t-shirt will be mailed to you. All passports will be returned.



Want to join in on the fun but don't want to be a member? No problem. All trails will be advertised in *Tideline* and on our web site. Choose the trails you want to walk and show up at the designated location and time. No reservations needed. Bring your friends! There are over 30 miles of hiking trails on the refuge just waiting to be explored!

Sign me up for the Refuge Rambler Club!

Complete the form below to receive a patch, a schedule, trail descriptions, and a passport.

Mail the form to Carmen Minch, 9500 Thornton Ave, Newark, CA 94560

Name: _____

Address: _____

Phone Number: _____

Email Address: _____



Teens working on a teambuilding exercise

*Teens
take action!*

**BE A
HABITAT
HERO**

*July 8 – 11
9 a.m. to 3 p.m.*

If you are age 13-17 and have the desire to develop leadership skills through teambuilding activities and community service on a National Wildlife Refuge this is a program for YOU! Participants will also serve at one of our special events in 2008. We are specifically recruiting Junior Leaders for our Marsh-In Summer Camp later in the summer. The program is FREE, but space is limited. Applicants must attend all four days of the program and be able to fulfill the service component in 2008.

How to apply: Please submit a letter (one page) of interest (with your name, age, address, phone number, parent/guardian's name) indicating why you would like to participate AND a letter of reference from someone who knows you well (teacher, coach, neighbor, etc.) Application deadline is 5:00 pm on Friday, June 13, 2008.

Participants will be notified by mail and subject to parent/guardian approval.
Questions? Please call Tia at 510-792-0222 ext. 36.

Please send your letters to:
Habitat Heroes
c/o EE Specialist
9500 Thornton Ave.
Newark, CA 94560

**What are YOU
doing to save the
environment?**

Home on the (Antioch Dunes Refuge) Range?

by Christy Smith

Those who toured Antioch Dunes National Wildlife Refuge in the spring are now able to add one more species to their species list. The vision of cows munching on grass may have startled some wildlife watchers who are familiar with the inland dune ecosystem known for its endemic rare plants and animals.

Once a large complex of riverine sand dunes, the site is now limited to 55 acres due to urban development and sand mining activities up to the establishment of the refuge in 1980. Most of the original habitat and sand substrate are gone and the site, rather than being reminiscent of dunes, is more comparable to a flat or a pit. Without active, moving sand dunes, invasive non-native plant species have the upper hand throughout the refuge. These invasive non-native plants out-compete two



endemic endangered plants, the Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*) and the Antioch Dunes evening primrose (*Oenothera deltooides* spp. *Howellii*). It also out-competes the naked stem buckwheat (*Eriogonum nudum* var. *auriculatum*) which is the host plant for the endangered Lange's metalmark butterfly (*Apodemia mormo langei*).

Measures to eliminate the non-native plants over the past several years included hand pulling and chemical and mechanical controls. While these practices have worked, the invasion of non-natives has out-paced control efforts. A faster and more sustainable system of controlling invasive species was needed. Without aggressive management actions, the extinction of the Lange's metalmark butterfly is imminent.

Grazing can be an effective management tool to reduce invasive plants and is well documented. In checkerspot butterfly

habitats, grazing has been used to reduce competition while improving the condition of sites for native plant species.

Fueled by these positive outcomes, cows were introduced into Antioch Dunes NWR in March and are being monitored daily. When grazing was first considered, discussion ensued to determine which herbivore would best fit the need. The primary invading plant species that are doing the most harm to the habitat include grasses (rip-gut brome) and vetch. While sheep and goats may eat these species, they would also eat wallflower, primrose and naked stem buckwheat. Since the wallflower and primrose are endangered species and the Lange's metalmark butterfly is completely dependent upon the buckwheat for its life cycle, our first concern was to do as little harm to those species.

Cattle are grazers, meaning they prefer grasses to other plant types. Cattle may be a viable and sustainable means of managing invasives by removing excessive duff and vegetative cover. In addition to removing excess cover, these large, heavy animals will disturb the soil in a controlled manner, creating ideal conditions for the endangered plants and the naked stem buckwheat to thrive. Grazing may reduce the competitive ability of invasive annuals so that the naked stem buckwheat will have a chance to grow and reproduce throughout the refuge, providing the needed habitat for the butterfly. Grazing is monitored closely to minimize negative effects on the endangered species, to determine the timing and frequency of grazing that is most effective, and to calculate the number of animals that is most beneficial.

The grazing experiment is exactly that, an experiment on only ten acres of the refuge. If successful, it will remove 30% of the non-native vegetative cover and provide an environment where buckwheat, primrose and wallflower will begin to establish naturally. Grazing is not expected to be a "cure-all" for controlling invasive plants, but rather another tool to complement other management efforts.

For information contact refuge manager, Christy Smith, 707-769-4200.



Clyde Morris (center) accepts award from FWS Director Dale Hall (left), and National Wildlife Refuge Association President Evan Hirsche (right).

Clyde Morris receives NWRS 2008 Employee of the Year Award!

Each year the National Wildlife Refuge Association and National Fish & Wildlife Foundation recognize outstanding effort by refuge volunteers and exceptional performance by refuge staff. The annual Employee of the Year Award is presented to an individual whose career has shown a commitment to the conservation of our natural resources and superior effectiveness in advancing the cause of wildlife conservation. Clyde Morris, Manager of the Don Edwards San Francisco Bay National Wildlife Refuge received the 2008 Employee of the Year Award at a ceremony in conjunction with the 73rd North American Wildlife and Natural Resources Conference, March 25-29 in Phoenix, AZ.

Mr. Morris' innovation, leadership and vision, combined with a strong natural resource conservation ethic, sound biological knowledge, and skill in public administration, provided the exact mix of knowledge and ability needed to concurrently oversee multiple large-scale habitat restoration projects on the refuge. Morris skillfully balanced the needs of the refuge (with its threatened and endangered species and large numbers of migratory birds) with the needs of the surrounding communities and their seven million residents.

Morris retired earlier this year, after 10 years with the U.S. Fish & Wildlife Service as Manager of the Don Edwards San Francisco Bay National Wildlife Refuge.

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 January 8, 2008 and April 14, 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

Memorials/Honorariums

In Honor of Jacqueline A Jackson

Leader

Robert Jarmuz

Participant

Joyce Barlett, Marge Callow, LaVonne Coleman, Ronald G Franck, Hollis Lenderking, Norman & Marcia Houseworth, and Varon Smith

Supporter

Anonymous, Terry & Zeo Coddington, Joseph V Costello, Jr, Jeanette D Jensen, Locke Jorgensen, Jens Steineke, Mendel Stewart, Tanis Walters, Gerald Watanabe, and Carol Wolf

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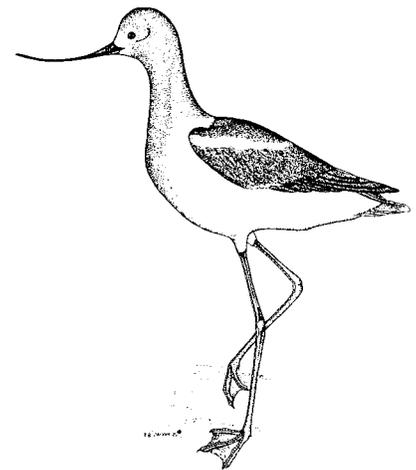
Mary & Gene Bobik, John R Boice, Richard Booth, Lynne Fitzjarrell, Barbara & Bill Francis, Craig & Barbara L Heckman, Sue Hunt, Bruce Kelly & Lynn Trostad, Douglas & Beckie Kinghorn, Dale & Diane Schouten, and Terry Smith

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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:

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

Check Visa or MasterCard # _____ Exp. Date _____

Signature _____

Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ *Thank you for your support!*

Congratulations to the 26th Annual Endangered Species Poster Contest Winners!

Congratulations to **Daniel Chiu** for taking the **Best in Show** in the Don Edwards San Francisco Bay National Wildlife Refuge 26th Annual Endangered Species Poster Contest! This contest is held annually for schools in Union City, Newark, Fremont, and East Palo Alto. Thank you to all who entered. First, second, and third place finishers in each grade level from Kindergarten to 6th grade along with Honorable Mentions can be viewed on-line at www.fws.gov/desfbay/contest.htm. A huge thank you to the San Francisco Bay Wildlife Society for sponsoring the event and BayFrames for framing the Best in Show winner!

1st Place

Samridh Bhattacharjee
Kindergarten, Parkmont Elementary
Agamchet Dhami
First Grade, Maloney Elementary
Tara Bhatia
Second Grade, Maloney Elementary
Avani Narayan
Third Grade, Pioneer Elementary
Deborah Chen
Fourth Grade, Chadbourne Elementary
Lillian Dong
Fifth Grade, Chadbourne Elementary
Tammy Tseng
Sixth Grade, Gomes Elementary

2nd Place

Shreyas Saimivason
Kindergarten, Ardenwood Elementary
Alex Giang
First Grade, Maloney Elementary
Kevin Lee
Second Grade, Ardenwood Elementary
Saheed Asfaur Palacios
Third Grade, Pioneer Elementary
Lawrence Chen
Fourth Grade, Ardenwood Elementary
Sneha Patkar
Fifth Grade, Forest Park Elementary
Kerrie Wu
Sixth Grade, Gomes Elementary

3rd Place

Aalaya Wudaru
Kindergarten, Parkmont Elementary

Images printed with the artists' guardian's permission



*Daniel Chiu, Best in Show
San Joaquin Kit Fox
Ardenwood Elementary, 1st Grade*

Aditya Rathad
First Grade, Maloney Elementary
Tatiana Miramontes
Second Grade, Milani Elementary
Maelani Lacamdazon
Third Grade, Pioneer Elementary
Jenny Chiu
Fourth Grade, Ardenwood Elementary
Melissa Ng
Sixth Grade, Gomes Elementary

Honorable Mention

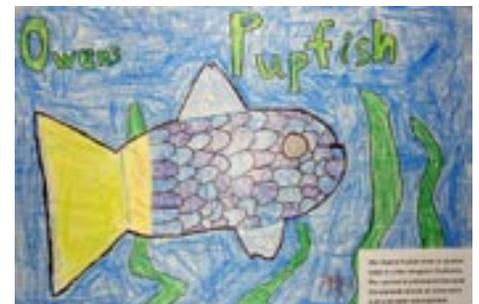
Kavya Subraman Yam
Kindergarten, Ardenwood Elementary
Cytherea Aban
First Grade, Maloney Elementary
Kevin Landeros
Second Grade, Milani Elementary
Vicky Liu
Third Grade, Pioneer Elementary
Olivia Zheng
Fourth Grade, Chadbourne Elementary
David Hu
Sixth Grade, Gomes Elementary



Lillian Dong, 1st Place, 5th grade



David Hu, Honorable Mention, 6th grade



Kevin Lee, 2nd Place, 2nd grade



Aditya Rathad, 3rd Place, 1st grade

Summer Activity Schedule

J U N E

Friday, June 6

*Night Sky Party!

Environmental Education Center, Alviso

8:00 p.m. - 9:30 p.m.

Meet the stars of summer. Join amateur astronomer Bob Havner as we learn about constellations. Make a star chart, and then venture outside to view the night sky through a telescope while warming up with hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly as it gets cold in the evening. Fun for the whole family! RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext 102.

Saturday, June 7

*Ohlone Uses of Plants

Environmental Education Center, Alviso

1:30 p.m. - 3:00 p.m.

Explore the plants traditionally used by the original inhabitants of this area, the Ohlone Indians. 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.

Botanical Wanderings

Visitor Center, Fremont

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

Discover the diverse summer habitats from the hilltops to the marsh. This guided walk will discuss how Native Americans utilized plants found on the refuge and some of the medicinal properties the plants contain. Led by Mansur Nur. Reservations required. Call 510-792-0222 ext. 43

Sunday, June 8

Edible Plants on the Refuge

Visitor Center, Fremont

11:00 a.m. - 12:30 p.m.

Take a guided walk on Tidelands Trail and discover which plants are edible or have medicinal uses. We'll taste some of these plants on the refuge, or in commercially made products. Led by Carmen Minch.

Beginning Bird Photography Workshop

Visitor Center, Fremont

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. Warm clothing and comfortable walking shoes recommended. Led by Jennifer Woo. Space is limited. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Saturday, June 14

Exploring the Dunes

Antioch Dunes NWR, Antioch

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

Here's your chance to explore a 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.

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 on the levees. Get a glimpse of Drawbridge and see a variety of our summer 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. Call Lindy at 408-262-5513 ext 102 for reservations.

*Birding by Van

Environmental Education Center, Alviso

2:30 p.m. - 4:30 p.m.

Whether you are a novice or expert birder, this program is designed for people who enjoy birding but are unable to walk far. Bird watching will be done by van with some brief stops. The vans cannot accommodate wheelchairs; birders must be able to maneuver into and out of the van on their own. Join Ceal Craig as she drives you on the levees to view birds. This two-hour trip is not suitable for children. Space is very limited. RESERVATIONS ARE ESSENTIAL. Call 408-262-5513 ext. 102.

Twilight Marsh Walk

Visitor Center, Fremont

7:30 p.m. - 9:00 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. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Sunday, June 15

*Father's Day Walk

Environmental Education Center, Alviso

10:00 a.m. - 12:00 p.m.

Attention fathers, dads, and pops! Come enjoy a morning out with the family. Learn bird watching tips with an interactive presentation, then take a bird watching walk (easy and level). If you would like to plan a picnic afterwards, (not part of the program) there is a great spot in the pavilion outside! Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, June 21

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.

Saturday, June 28

Coyote Creek Lagoon Trail - 5 miles, Fremont

Meet at the Trailhead in Fremont.

Directions below.

9:00 a.m.

Meet new people while getting fit and healthy! This is the first walk featured in the Refuge Rambler club. This trail at Coyote Creek Lagoon is five miles, flat, and level. The walk is self-paced and you may turn back at anytime. Hats, water, and sunscreen are strongly recommended. You do not need to be a Refuge Rambler to join this walk. To become a Refuge Rambler, see page 5. No reservations are needed. A volunteer 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

Let's Go Outside!

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

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

Hwy 880, take the South Fremont Blvd/Cushing Pkwy exit. Drive south on Fremont Blvd on the west side of Hwy 880 until it dead ends. Meet at the parking lot on the right adjacent to 48481 Fremont Blvd.

***Reading at the Refuge**

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. This program is geared for ages 4 and up. Led by teacher/librarian Pat Hartinger. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext 102.

Sunday, June 29

***Avian Antics**

Environmental Education Center, Alviso

10:00 a.m. - 11:30 a.m.

Join us at the refuge as we explore the trails and attend a low-tide feast. Learn some bird trivia along the way. For instance, why do some birds eat their own feathers or which refuge bird finds a mate for life? Bring your own binoculars, or borrow one of ours! This is a quiet walk so the birds don't fly away. Recommended for all ages. Reservations required. Call Molly at 408-262-5513 ext 104.

J U L Y

Saturday, July 5

Tidelands Trail Walk

Visitor Center, Fremont

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

Explore the Tidelands Trail with a naturalist and learn about the plants and animals that thrive in the salt marshes and uplands. Reservations are required. Call 510-792-0222 ext. 43. Led by Mansur Nur.

Saturday, July 12

***Drawbridge**

Environmental Education Center, Alviso

9:30 a.m. - 12:00 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? We'll start with a slide show then take a short minivan excursion to view Drawbridge across Coyote Creek. Led by Ceal Craig. Program is intended for adults. Space is very limited. RESERVATIONS ARE ESSENTIAL. Call Lindy at 408-262-5513 ext. 102. *(Please note: We cannot visit the town itself. We will drive to the best location where one can legally view Drawbridge.)*

Exploring the Dunes

Antioch Dunes NWR, Antioch

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

Here's your chance to explore the 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.

***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 shorebirds 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. Warm clothing and comfortable walking shoes recommended. Led by Jennifer Woo. Space is limited. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Sunday, July 13

***Habitat Hike**

Environmental Education Center, Alviso

10:00 a.m. - 11:30 a.m.

Do you enjoy exploring nature? Do you find yourself 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 are human-altered. We will observe and identify plants, birds, and whatever other animals we see on this short and easy trek. This program is wheelchair and stroller accessible. Recommended for all ages. Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, July 19

***Wetland Safari**

Environmental Education Center, Alviso

9:30 a.m. - 11:00 a.m.

Take a van tour around our former salt ponds and see more birds than you normally would near the Education Center. There will be several stops for better viewing and photo-taking opportunities. Plus, we will see what is left of Drawbridge. If necessary, more trips to accommodate more people can be added. Open to all ages. RESERVATIONS REQUIRED. Call Lindy at 262-5513 ext 102.

Summer Activity Schedule

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.

***Community Service**

Environmental Education Center, Alviso

2:00 p.m. - 4:00 p.m.

Do you need to fulfill community service requirements? 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. Recommended for ages 9 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Twilight Marsh Walk

Visitor Center, Fremont

7:30 p.m. - 9:00 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. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Wednesday, July 23

Salinity Sleuths

Environmental Education Center, Alviso

2:30 p.m. - 4:00 p.m.

Step into the shoes of a scientist and strap on our field detective packs for a hands-on investigation where we will collect water samples, use plant clues, and do some sleuthing around to uncover how salty the water is. You will need to bring along keen senses of taste, smell and sight to determine which plants and animals live in the

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

Summer Activity Schedule

refuge's salty habitats! Recommended for ages 6 and up. Reservations required. Call Molly at 408-262-5513, ext. 104.

Saturday, July 26

***Mallard Slough Trail – 5.5 miles**
Environmental Education Center, Alviso
9:30 a.m.

Meet new people while getting fit and healthy! This is the second walk featured in the Refuge Rambler club. This trail at the Environmental Education Center is 5.5 miles, flat, and level. The walk is self-paced and you may turn back at anytime. You do not need to be a Refuge Rambler to join this walk. To become a Refuge Rambler, see page 5. No reservations are needed. Hats, water, and sunscreen are strongly recommended. A volunteer will be there to greet you at 9:30 a.m. For a narrative description of this trail, log on to the Don Edwards web site at <http://www.fws.gov/desfbay>.

Beginning Bird Watching for Families

Kelley Park next to Happy Hollow Park and Zoo, San Jose
8:30 a.m. – 10:00 a.m.

Want to know what kind of bird that is in your backyard? Come learn about wild birds that live at Kelley Park next to Happy Hollow Park and Zoo. Interpretive Specialist Lindy Nice takes "Children's Beginning Bird Watching" on the road. This a great program for families to learn about the birds they see at home. Program is free. Suitable for ages 5 and up. Reservations required. Call Vanessa Rogier at 408-277-3065.

***Just for Tots: July Discoveries**
Environmental Education Center, Alviso
2:00 p.m. – 3:30 p.m.

Come explore the refuge and learn all 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 puppets, a craft, and a short walk. Children must be accompanied by an adult. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Sunday, July 27

Where Does All the Water Go?
Environmental Education Center, Alviso
2:00 p.m. – 3:30 p.m.

Are you curious about where wastewater goes after we flush, rinse, wash, and shower? Come enjoy a presentation about how the San Jose/Santa Clara Water Pollution Control Plant cleans wastewater. After the presentation there will be a short tour that will get participants up close and personal with wastewater and the refuge habitats involved. Appropriate for ages 10 and up. Reservations required. Call Molly at 408-262-5513, ext. 104.

AUGUST

Saturday, August 2

Geokids
Visitor Center, Fremont
2:00 p.m. – 3:30 p.m.

A rock in the hand is worth . . . This hands-on activity is great for kids who want to know more about why some rocks are different from others. Come along on a short hike and discover the official state rock! Led by Mansur Nur.

***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 shorebirds 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. Warm clothing and comfortable walking shoes recommended. Led by Jennifer Woo. Space is limited. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Saturday, August 9

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 lim-

ited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

***Intermediate Bird Photography Workshop**
Environmental Education Center, Alviso
10:00 a.m. - 2:00 p.m.

Continuing where "Beginning Bird Photography" left off, this 4-hour workshop will first address aesthetic issues (e.g., advanced composition), animal behavior, and field techniques. After lunch, we will focus on technical issues (exposure, depth of field, teleconverters, flash, etc.). Some material is geared for SLR cameras, but most is applicable to any camera type. Lastly, we'll take a short stroll in the refuge to practice what we learned. Not suitable for children. Program led by Paul Bridges. Please be sure to bring your lunch, comfortable walking shoes, and your camera. Space is very limited. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

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

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.

Stevens Creek East Trail – 3 miles
Meet at the Trailhead in Mountain View.
Directions below.
9:00 a.m.

Meet new people while getting fit and healthy! This is the third walk featured in the Refuge Rambler club. This trail in Mountain View is three miles, flat, and level. The walk is self-paced and you may turn back at anytime. You do not need to be a Refuge Rambler to join this walk. To become a

Refuge Rambler, see page 5. No reservations are needed. Hats, water, and sunscreen are strongly recommended. A volunteer 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 101, take the Shoreline Blvd exit and drive north 0.9 miles to Crittenden lane. Turn right on Crittenden Lane and drive 0.4 miles until the road ends. Walk past the sign for A&Z Tree Movers and up to the Stevens Creek levee to the paved trail on the west side of the creek. Cross the bridge to the east side of the creek and turn left to the brown metal gate.

Let's Go Outside!

Let's Go Outside!

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

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

Summer Activity Schedule

Sunday, August 24

***Native Species Scavenger Hunt**
Environmental Education Center, Alviso
10:00 a.m. – 11:30 a.m.

The refuge is a mosaic of different habitats, each habitat supporting an array of California native wildlife. Come enjoy the outdoors as we embark on a scavenger hunt, exploring the refuge habitats and the creatures that call them home. We will get up close and personal with the salt marsh, sloughs, and salt ponds on our short and easy trek. Binoculars and I.D. charts in hand, we will identify native plants and animals. We will also learn how these wetland habitats are impacted by humans. All ages welcome. Reservations required. Call Molly at 408-262-5513 ext. 104.

Saturday, August 30

Ravenswood Trail – 5 miles
Meet at the Trailhead in Menlo Park.
Directions below.
9:00 a.m.

Meet new people while getting fit and healthy! This is the fourth walk featured in the Refuge Rambler club. This trail in Menlo Park is five miles, flat, and level. The walk is self-paced and you may turn back at anytime. You do not need to be a Refuge Rambler to join this walk. To become a Refuge Rambler, see page

5. No reservations are needed. Hats, water, and sunscreen are strongly recommended. A volunteer will be there to greet you at the brown metal gate 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:** Ravenswood Trail is on the west side of the Dumbarton Bridge. From the East Bay, cross over the Dumbarton Bridge and exit at the Ravenswood Unit sign. Drive east 0.3 miles on the frontage road until you see a brown metal gate and the Ravenswood Trail Sign. From Menlo Park, drive Hwy 84 toward the Dumbarton Bridge. Exit at the Ravenswood Unit sign and drive east on the frontage road. Cross under the bridge and back west 0.6 miles until you see the brown metal gate and refuge sign.

Let's Go Outside!

Sunday, August 10

***Extended Wetland Expedition**
Environmental Education Center, Alviso
1:00 p.m. – 4:00 p.m.

Come join us as we follow the Artesian Slough out to Coyote Creek. We will be taking a 1.5 mile walk on the salt pond levee trails to explore wetland alteration. Along the way we will develop scientific questions and test hypotheses about human impacts on wetlands. Recommended for ages 9 and up. Program may be canceled due to weather. Reservations required. Call Molly at 408-262-5513 ext. 104.

Wednesday, August 13

Beginning Bird Watching for Families

Kelley Park next to Happy Hollow Park and Zoo, San Jose
9:00 a.m. – 10:30 a.m.

Want to know what kind of bird that is in your backyard? Come learn about wild birds that live at Kelley Park next to Happy Hollow Park and Zoo. Interpretive Specialist Lindy Nice takes "Children's Beginning Birdwatching" on the road. This a great program for families to learn about the birds they see at home. Program is free. Suitable for ages 5 and up. Reservations Required. Call Vanessa Rogier at 408-277-3065.

Saturday, August 16

***Lazy Days of Summer**
Environmental Education Center, Alviso
10:00 a.m. – 11:30 a.m.

The hectic days of locating a nesting site and mating are over. Now our wildlife friends are busy raising their families. Join us in a leisurely walk around refuge habitats to observe summer living. Bring sunscreen and a hat. Open to all ages. Please call Lindy at 408-262-5513 ext. 102 to make a reservation.

Community Service

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

Do you need to fulfill community service requirements? 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. Recommended for ages 9 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Twilight Marsh Walk

Visitor Center, Fremont
7:00 p.m. – 8:30 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. Meet at the observation deck. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Saturday, August 23

***Drawbridge**
Environmental Education Center, Alviso
9:30 a.m. – 12:00 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? We'll start with a slide show then take a short minivan excursion to view Drawbridge across Coyote Creek. Program intended for adults. Presented by Ceal Craig. Space is very limited. RESERVATIONS ARE ESSENTIAL. Call Lindy at 408-262-5513 ext. 102. (*Please Note:* We cannot visit the town itself. We will go to the best location where one can legally view Drawbridge.)

***Getting Ready for Fall Planting**
Environmental Education Center, Alviso
10:30 a.m. – 12:00 p.m.

Are you thinking about fall planting? Want to know more about native plants? Here is the program for you! Come see and learn about native plants that not only attract wildlife and require little watering, but will add beauty to your garden. Led by June Smith. Program intended for adults, but all ages welcome. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

***Reading at the Refuge**
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. This program is geared for ages 4 and up. Led by teacher/librarian Pat Hartinger. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext 102.

Exploring Owls
Visitor Center Auditorium, 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 their pellets to see what they eat. Recommended for ages 7 and up. Led by Paul Bridges. Reservations required. Call 510-792-0222 ext. 43.

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

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

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

Investigate the creatures of the mud flats, collect plankton samples from the slough and explore the features of the salt marsh on a Wetland Round-up Field Trip. This program is designed for grades K-6, for up to 65 students. Fall 2008 field trips will be offered from October - December 2008.

Reservations for Fall field trips begin on Tuesday, September 9th, 2008 between 4:00 p.m. and 5:00 p.m. To make a reservation on September 9th, call Tia Glagolev at 510-792-0222. After September 9th, call the Environmental Education Intern at 408-262-5513 ext. 42.

Field Trip Orientation Workshop Dates at the Learning Center in Fremont

Wetland Round-Up field trip orientations will be announced in the fall.

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. Fall 2008 field trips will be offered from October - December 2008.

Reservations for Fall field trips begin on Tuesday, September 9th, 2008 between 4:00 p.m. and 5:00 p.m. To make a reservation on September 9th, call Genie Moore at 408-262-5513.

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

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

Wetland Round-Up field trip orientations will be announced in the fall.

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.

5th and 6th Grades: We offer a combined classroom presentation and an all day hands-on field trip at the refuge.

7th - 12th Grades: We offer classroom presentations and/or a field trip at the refuge.

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.



Free Discovery Packs available at the Visitor Center and Environmental Education Center!

Explore the habitats and the birds of the refuge with your family or small youth group! The Discovery Pack includes an activity booklet, and equipment such as magnifying lenses and bug boxes that will help you take a closer look at the salt marsh plants and the birds. The back pack is suitable for up to six people, ages kindergarten - adults. There are also group packs available for 12-24 people (only in Fremont). Please call in advance if you would like a group pack. You can check out the Discovery Packs free of charge at the Visitor Center in Fremont or at the Environmental Education Center in Alviso. A limited number of binoculars are also available to borrow. The Visitor Center is open Tuesday-Sunday from 10:00 a.m. to 5:00 p.m. For questions or to reserve a group pack in Fremont, please call 510-792-0222. The Environmental Education Center is open Saturday and Sunday from 10:00 a.m. to 5:00 p.m. For questions, please call 408-262-5513.



TIDELINE

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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 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 Loredo
 Don Edwards Wildlife Specialist:Eric Mruz
 Farallon Wildlife Specialist: Zach Coffman
 North Bay Refuges Manager:.....Christy Smith
 North Bay Wildlife Specialist:.....Louis Terrazas
 Monterey Bay Refuges Manager:.....Diane Kodama
 Monterey Bay Wildlife Specialist.....Rachel Hurt
 Refuge Planner: Winnie Chan
 Chief of Visitor Services:.....Karla Tanner
 Outdoor Recreation Planners:..... Carmen Minch,
 Jennifer Heroux
 Environmental Education Specialists: ... Genie Moore
 Tia Glagolev
 Law Enforcement Officers:.....Walter Duran,
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 Gerry McChesney, Susan Euing,
 Peter Kappes, Cheryl Strong
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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.

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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

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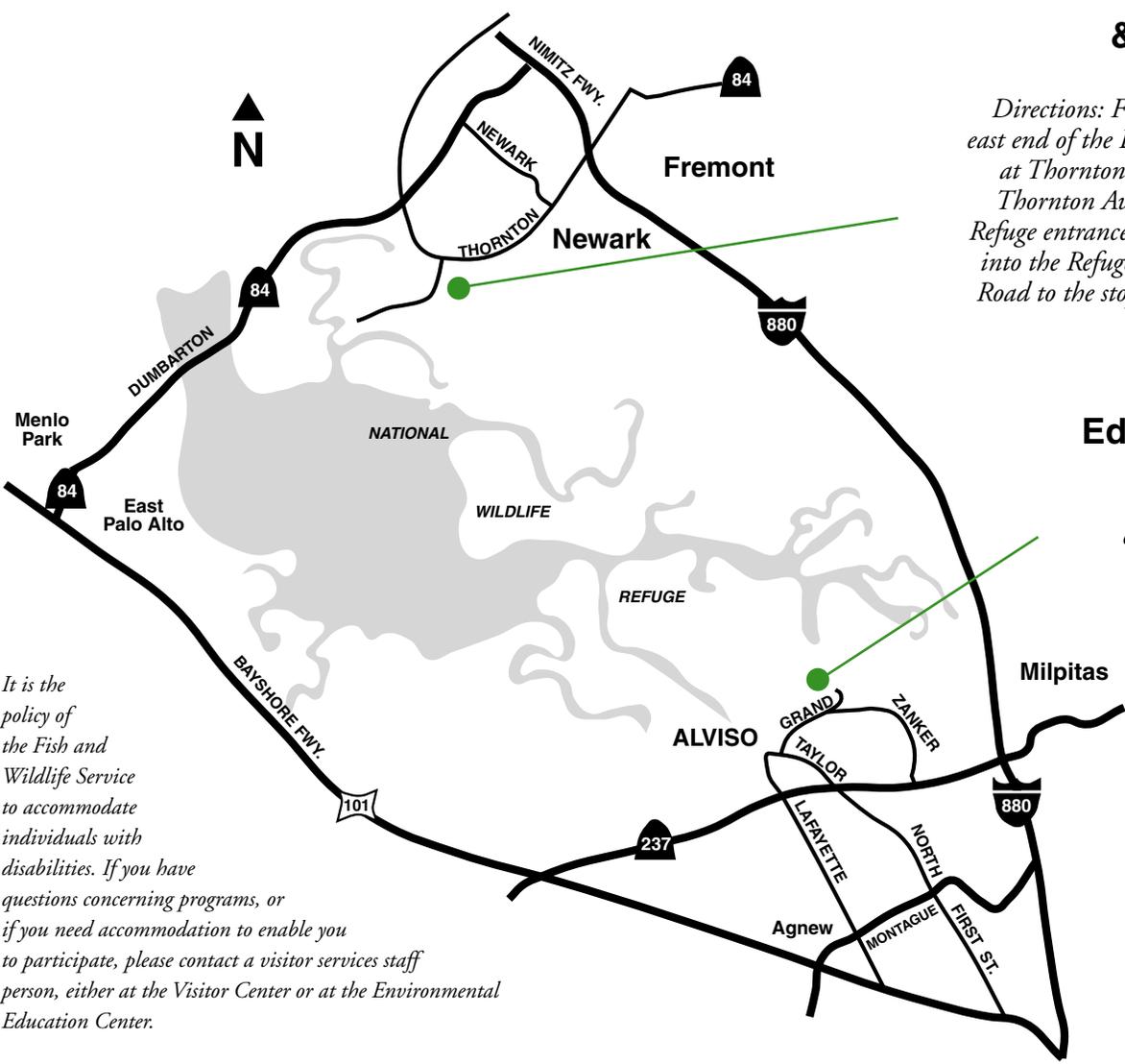
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Inside This Issue

- 1 Traces
- 3 Refuge Reflections
- 4-5 Let's Go Outside!
- 6 Habitat Heroes
- 7 Cows at Antioch Dunes
- 8 Thanks SFBWS Donors
- 9 ES Poster Contest Winners
- 10-13 Summer Activities
- 14 Field Trips to the Refuge

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.