

# Tideline



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

## A Decade of Restoration in the South Bay

By Doug Cordell

“This is an enormously ambitious project requiring years of planning—and we’re already seeing results on the ground,” says Eric Mruz, manager of the Don Edwards San Francisco Bay National Wildlife Refuge on the tenth anniversary of the historic land acquisition for the South Bay Salt Pond Restoration Project. The project, an unprecedented effort in the middle of a major urban center, involves restoring a landscape the size of Manhattan to a thriving wetland ecosystem.

In 2003, under the leadership of U.S. Senator Dianne Feinstein, 15,100 acres of former commercial salt ponds were purchased or acquired through donation from Cargill, Inc., the first step in a campaign to restore 100,000 acres of lost tidal wetlands around San Francisco Bay. Funds for the acquisition were provided by federal and state resource agencies and several private foundations, including the William and Flora Hewlett Foundation, the Gordon and Betty Moore Foundation, and the David and Lucile Packard Foundation.

The acquisition of the salt ponds grew out of an increased awareness of the need to do something about the 85% of tidal wetlands around the Bay that were lost to development over the last century and a half. These habitats serve as giant filters, removing toxic pollution and nutrient runoff that otherwise impact the Bay’s fragile ecosystem. Historically, Bay wetlands have also worked as natural sponges that protect communities from tidal flooding by absorbing and slowly releasing storm water. On the climate front, they capture and store atmospheric carbon that otherwise would

contribute to global warming; and they serve as a natural buffer against sea level rise. Not least of all, the Bay’s wetlands pulse each year with thousands of migrating and resident birds, fish and other species that

water quality in the Bay and increased the risk of flooding.

The 2003 acquisition was a bold step to reverse some of those trends.

“It’s a rare opportunity to reverse some



*The endangered California clapper rail is one of the species that the Salt Pond Restoration Project hopes to increase population numbers. Photo: Judy Irving*

rely on these habitats to forage, rest, and raise their young.

Unfortunately, the region’s vital wetland network was seriously compromised as land near the Bay was drained and diked for farming, urban development and salt production. A result has been the dramatic decline in marsh-dependent species like the salt marsh harvest mouse and the California clapper rail, both of which are currently threatened with extinction. The loss of tidal wetlands has also contributed to decreased

of the damage done to Bay habitats over the last century,” says John Bourgeois, Executive Project Manager of the effort.

After the property was acquired, the U.S. Fish & Wildlife Service (USFWS), the California Department of Fish and Game (now CA Department of Fish and Wildlife, or DFW) and the California State Coastal Conservancy (SCC) launched a five-year process, bringing together a broad coalition

continued next page

of agency staff, scientists and members of the public to design a restoration plan for the property. The final plan, adopted in 2008, is a blueprint for achieving the project's three main goals: habitat restoration, public access for wildlife-oriented recreation, and flood risk management. The restoration is designed to be implemented in phases, stretching over the next several decades.

Shortly after the adoption of the final plan in 2008, Phase One of the restoration began at the project's three salt pond



*Breaching of Pond A6 Levee. Photo: Judy Irving*

complexes: the Ravenswood ponds on the west shore of the Bay near Menlo Park, the Alviso ponds in the far reaches of the South Bay, and the Eden Landing Ponds along the East Bay shoreline near Hayward. For each of the pond complexes, a Working Group of interested parties meets regularly to focus on design, construction and research issues. There are also regular Stakeholder Forums that foster broader public participation for the project as a whole. In addition, there are monthly coordination meetings of the Project Management Team, with representatives from participating agencies USFWS, SCC, DFW, the U.S. Army Corps of Engineers, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, the Santa Clara Valley Water District, and the Alameda County Flood Control and Conservation District.

For habitat restoration, the goal of the project is to provide a mix of habitats,

including both the tidal marsh that historically ringed the Bay and shallow- and deep-water ponds for shorebird and waterfowl species that found habitat on commercial salt ponds when development drove them out of other areas.

At the Ravenswood ponds, for instance, Phase One saw the completion of managed pond SF2, including 240 acres of enhanced pond habitat for nesting and resting shorebirds like the western snowy plover. The SF2 restoration also meets the goal of increased public access, with a nearly three-quarter mile trail and two viewing platforms with interpretive displays.

Meanwhile, at the Alviso complex, over 2,600 acres of ponds have been connected to the Bay, creating new tidal marsh for endangered species, as well as shallow water habitat for shorebirds, pelicans, cormorants and ducks. Another 240 acres of designed pond habitat include shallow waters and 16 nesting islands for migrating shorebirds such as avocets and stilts. For the public, two and a half miles of new Bay Trail were opened between Sunnyvale and Mountain View's Shoreline Park.

At Eden Landing, 630 acres of tidal habitat have been restored, along with 230 acres of pond habitat for a variety of bird species such as phalaropes and eared grebes. Public amenities will include 3.8 miles of new trails, an interpretive site with raised walkways and viewing platforms overlooking the remnants of the historic salt works, and a kayak launch.

Phase Two of the restoration, now in

the planning stage, envisions opening more ponds to tidal action so they can transition to marsh; improving the quality and diversity of managed ponds; and adding more recreational trails and interpretive displays.

"The restoration of these lands is the culmination of decades of work," says Florence LaRiviere, founding member of the Citizens Committee to Complete the Refuge, one of a number of local groups that have been advocating for the preservation and restoration of Bay Area wetlands since the 1960s.

As for the third principal goal of the project, flood risk management, planners have also taken a phased approach. The development of fully restored wetlands that buffer against flooding will take decades. Meanwhile, there is a need for flood protection in the South Bay. In the near term that will be met by maintaining a portion of the levees that Cargill and its predecessors originally built for salt-making purposes. Over the years, these levees have provided de facto flood protection for communities in the South Bay—like Alviso, which sits twelve feet below sea level. With a longer view, the project is partnering with the U.S. Army Corps of Engineers and local agencies to design a comprehensive flood control plan for the South Bay shoreline that will be integrated with habitat restoration.

One of the unique features of the restoration project is its use of Adaptive Management—the process of taking lessons learned on the ground in restoration activities and folding them into future management practices. That process is playing a critical role in determining which combination of habitats provides the best environment for resident and migrating species of birds, fish and other wildlife.

Science is central to the adaptive management program. Each year, the project's scientists monitor and evaluate new data on everything from mercury accumulation and sediment dynamics to the impact of trail use on birds. That information, in turn, guides management decisions about future restoration work, public access and flood risk management.

Early scientific research by the project has produced some notable findings. For instance, restoration sites at the Island Ponds in the southernmost portion of the Bay are accumulating sediment more rapidly than expected, which augurs well for the future

development of thriving wetlands. In fact, in the less than five years since restoration of the Island Ponds was undertaken, the area is showing significant plant colonization. Satellite imagery has been found to be particularly effective in tracking large-scale vegetation shifts.

Scientific monitoring has also shown an increase in native fish inside several of the project's newly restored areas, and in adjacent creeks and sloughs. Meanwhile, at managed Pond SF2 near the western foot of the Dumbarton Bridge, newly created islands were seen to support 150 pairs of nesting shorebirds in the first year. Refinement of pond management techniques, based on scientific data, is also improving water quality and increasing the number of dabbling ducks and shorebirds.

One key to the success of the South Bay Salt Pond Restoration Project thus far has been the work of volunteers — some who have helped out on refuge lands for



*Vegetation recolonizes the mudflat of breached ponds as seen from above. Photo: Cris Benton*

many years, and others new to the work, many of them brought in groups brought by organizations like Save the Bay.

Anyone interested in visiting the restored ponds or volunteering to help with restoration work can find out more at: <http://www.southbayrestoration.org>.

Despite its impressive record to date, the restoration project faces some challenges in the coming years. One of the most significant is the accelerating pace of sea level rise. While restored tidal marshes lessen the impact of rising waters and protect levees that shield inland areas from storm waves and tidal surges, the marshes need sediment to anchor them. Though there is sufficient

sediment in the Bay now, that may change with a rising sea level. Which means that the sooner salt ponds are restored to tidal marshes and wetlands the better chance they will have to establish themselves and grow as the sea level rises.

Then, too, there is the need for continued funding of the project—always a challenge, but especially so in an era of government budget cutbacks.

Representatives of the project are confident, however, that they will meet those challenges. “We believe the Bay community will continue to make wetland restoration a priority,” says Executive Manager Bourgeois. “And the agencies are committed to seeing the work implemented. The benefits are simply too great.”

*Doug Cordell is the Public Affairs Officer for the San Francisco Bay National Wildlife Refuge Complex.*

## Cargill Salt a longstanding partner in tidal marsh restoration

This issue of *Tideline* celebrates the 10-year anniversary of the South Bay Salt Pond Restoration Project, the largest tidal wetland restoration program on the west coast. Our accomplishments to date, and our ability to tackle the challenges ahead, are reliant on partnerships with many agencies and organizations. One of our most central longstanding partners at the Don Edwards San Francisco Bay NWR is Cargill Salt.

Since the mid-19th century when local salt makers first built levees to enclose their ponds in order to better control and commercialize the production of salt, evaporative salt mining has transformed the landscape of the South Bay shoreline. The Don Edwards San Francisco Bay NWR was established in 1972, during a period when Bay Area communities and conservation groups responded to the alarming rate of shoreline development by setting aside baylands primarily for wildlife habitat and open space. While the refuge initially grew slowly with small parcels donated by conservation



groups, transfers of state-owned tidelands, and purchases of remnant marshland, its most significant growth came in 1979 from the transfer of 15,350 acres of Cargill's commercial salt ponds. In 2003, Cargill sold and donated an additional 16,500 acres to the Service and California Department Fish and Wildlife.

Cargill is a vital partner to the refuge by sharing its expertise from decades of operating the interconnected system of ponds, levees, and associated water control structures. On-the-ground know-how of Cargill employees has been crucial for maintaining the miles of levees built from

bay muds that are continually compromised by persistent waves, sustained winds, storm surge, and high winter tides. Their local knowledge of the idiosyncrasies of each pond resulting from its juxtaposition within the South Bay's geography has contributed to the design and implementation of our restoration efforts. This partnership has broadened to coordination of bird monitoring, predator control, levee maintenance, and public access on many ponds where salt-making continues today.

To date, Cargill has transferred over 90% of what were once its commercial salt ponds and associated properties, totaling 41,000 acres, to public agencies for habitat restoration, open space, and other public purposes. Although much of the former tidal marsh that ringed San Francisco Bay is permanently gone, these salt ponds are now providing an unprecedented opportunity to bring back tidal marsh and secure open space for present and future generations.

# A Condensed History of Commercial Salt Production in the San Francisco Bay Area

By Carmen Minch

From the time the first human inhabitants settled in the San Francisco Bay Area, salt has been harvested from the Bay's shoreline. Native Americans gathered salt from encrusted rocks to season their food and to barter with other tribes for goods. When the Mission San Jose Padres arrived in the late 18th Century, they improved salt harvesting techniques, building dikes

use in silver mining, tanning, and other industries.

Local salt was first considered suitable for human consumption in 1913 when the Leslie Salt Refining Company of San Mateo made technological breakthroughs in packaging and purification.

In 1936, the mechanical harvester was invented and salt production was largely consolidated when several salt companies

cheesemakers.

Salt ponds have been recognized by the San Francisco Bay Conservation and Development Commission and US Fish and Wildlife Service for their environmental benefits as wildlife habitat. The ponds provide a large water surface to moderate the climate and prevent smog, provide open space, wildlife habitat, and flood protection with the levees that surround the pond.

More than 15,000 acres of salt ponds were transferred to the US Fish and Wildlife Service to create the Don Edwards San Francisco Bay National Wildlife Refuge in 1979.

Over the past 35 years, Cargill has provided the majority of land that make up the Don Edwards San Francisco Bay National Wildlife Refuge as well as the Napa Sonoma Marshes and the South Bay Salt Pond Restoration Project – the largest wetland restoration project on the West Coast. The largest of these land transfers, which include both donations and sales, occurred in 2003, when 16,500 acres of land were transferred to the US

Fish and Wildlife Service and the California Department of Fish and Wildlife (formerly California Department of Fish and Game) for the purposes of improving wildlife habitat, and offering wildlife-oriented recreational opportunities. To date, 41,000 acres of land have been transferred to public agencies. More than \$150 million of the land value was donated by Cargill.

Salt and salt harvesting has always played a significant role in the San Francisco Bay Area. The shoreline has changed since Native Americans hand collected rock salt along the bay shore. Through all the transformations and land ownership, the salt ponds, natural and developed, continue to provide habitat for wildlife and resources beneficial to people.

*Acknowledgements: The author would like to thank Cargill Salt for their input on the history of commercial salt making in the San Francisco Bay Area.*



Photo: Cargill

around the natural salt ponds to speed up the evaporation process.

Commercial salt making started with the Gold Rush era, when demand for the commodity spiked. About the same time, the U.S. Congress, through the Arkansas Act of 1850, was encouraging settlers across the nation to dike, drain, and farm “swamp and overflowed lands.” Subsidized by state and federal land grants during the last half of the 19th century, settlers converted much of the South Bay's marshlands into pastures and salt ponds. The South Bay presented ideal conditions for producing solar salt: shallow flat land with impermeable clay soils, access to salty Bay water, a Mediterranean climate with summer winds to aid evaporation, plus favorable economics that included good transportation and ready markets.

Most of the early salt farmers were small, family-owned businesses. They harvested crude salt by pick and shovel for

merged to form the Leslie Salt Company.

Leslie Salt flourished as populations expanded and the West modernized. After WWII, Leslie produced salt to rebuild war-torn Asia and Australia by expanding and modernizing its Redwood City salt plant site. Post-War production peaked at 1.3 million tons, with five plants operating in the North and South Bay. In 1978, Cargill Incorporated, a Minneapolis-based private company, purchased Leslie Salt to expand its salt business. Today, Cargill operates two industrial plant sites near the Bay, in Newark and Redwood City.

Cargill's 200 union and management staff produce, purify and package salt for a spectrum of uses in food, agriculture, water quality, industry, and medicine. With the high demand for sea salt, business is thriving. The company's Newark facility produces 150 different salt products including: table salt, canning salt, baking salts, kosher salt, and micro-powder for California

# Differentiating between the subspecies of Salt Marsh Harvest Mice

By Liz Schneider

While many refuge visitors are familiar with the image of Salty, the iconic salt marsh harvest mouse, the endearing mammal's tiny stature and elusive nature make it a rare find in the wild.

This secrecy, combined with the low population numbers of the endangered mammal, makes it hard to know how the species is faring – let alone the status of the two separate subspecies that live in the Bay Area.

## Splitting Hairs

To answer this fundamental question, UC Davis genetics researcher Mark Statham is working on a scale even smaller than that of the 3-inch mouse – the scale of DNA extracted from a single hair.

By sampling mice genetics, Statham and his research team are looking to learn more about the differences between the subspecies besides their appearance and range. The northern subspecies lives in San Pablo and Suisun Bays, while the southern subspecies can be found in of Corte Madera, Richmond, and South San Francisco Bay.

With significant variation in individual appearances, it can be difficult to identify a mouse as one subspecies or the other - or even as the Western harvest mouse from which the salt marsh variety evolved – on the basis of appearance alone.

The most telltale difference is the reddish color of the southern subspecies, as opposed to the lighter coloration of their northern counterparts, but intermediate appearances are common. Although a certain amount of this genetic variation – and, in turn, appearance – is normal, Statham also posed a more interesting potential explanation.

He speculated that, due to the physical similarities between the salt marsh and the western mouse, there is a possibility that the two species may have interbred, creating hybrid offspring.

It's an intriguing idea, but it makes the precise work of genetics even more painstaking. A mix-up between the very similar-looking hairs from different species could wreak havoc on results.

"It's really important," Statham said.

"If we want to look at if these two different species of mice hybridize and samples get mixed along the way, we could get really kind of spurious answers."

Decisive evidence is still forthcoming on the plausibility of hybridization, but Statham's population studies also have to cope with more immediate challenges.

## The Challenges of Fragmentation

Before they can understand the full range of morphologies, Statham and other researchers working towards this goal must first attempt to identify all the tiny areas where the mice may live.

"There are an awful lot of areas where nobody has looked for a long time which have suitable marsh and might have harvest mice in them," Statham said. "They're all over the Bay Area, even if you ... see a little

bottlenecked, which has impacts on the genetic health of the population."

Genetic bottlenecks occur when a sharp reduction in population size reduces the amount of genetic variation in the remaining animals, leaving the population vulnerable to inbreeding and less able to adapt to changing habitats.

With many salt marshes either surrounded by developments or fully replaced with human habitat – less than a quarter of the Bay Area's salt marsh habitat remains intact – the risk of genetic bottlenecks seems high for salt marsh harvest mouse populations.

But if the populations already have poor genetic health, as Statham suspects, he cautions the problem is likely only going to get worse under a double whammy of human impacts.

Not only has development reduced and fragmented the mouse's habitat, the growing



piece of totally isolated marsh and there's built-up stuff all around it."

Statham said these tiny, isolated habitats aren't just a challenge for researchers. They may also spell trouble for the genetic health of the animals involved – one of many analyses he will run on the genetic data he collects.

"If you look at the [genes of the] animals in each area, you can get an idea of their genetic diversity," he said. "Low genetic diversity means it's isolated and

impacts of global warming are putting even greater pressure on mouse populations.

Statham said that as global warming cause sea levels to rise, the marshlands will begin to disappear underwater.

"These mice have nowhere to go, really," Statham said. "I think it will cause more fragmentation and it's something we've got to be aware of. If populations are fragmented and have minimal diversity as it is, it could get worse."

# Make Way for Science Day

Interact with biologists, see the types of field work they do,  
and become a citizen scientist

**October 13, 2013**

**7:00 a.m. - 4:00 p.m.**

**2 Marshlands Rd, Fremont**

The Don Edwards San Francisco Bay National Wildlife Refuge is gathering scientists and naturalists to introduce you to scientific data collection and land management techniques on national wildlife refuges. Meet the experts and see what they do first-hand. Train to be a citizen scientist and help monitor plants and animals on the refuge to document effects of climate change.

Take part in one or all of these programs:

- Reptile Survey
  - Phytoplankton Sampling
  - Song Bird Banding Demonstration
  - Mammal Trapping Demonstrations
  - Citizen Science Workshop
- Become a citizen scientist!




Open to all ages. Children under 16 must be accompanied by an adult.

A schedule and more information can be found on our website beginning October 1 at [http://www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay](http://www.fws.gov/refuge/don_edwards_san_francisco_bay)

Call 510-792-0222 ext. 476 for more information.

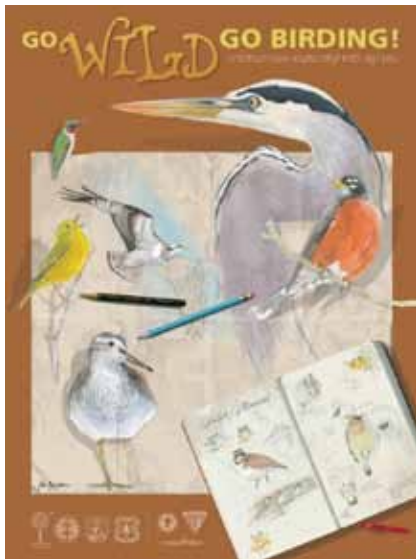


*Photos by Alex Baranda*

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San Francisco Bay NWR Complex



**Don Edwards San Francisco Bay National Wildlife Refuge  
San Francisco Bay Wildlife Society and**



**John Muir Laws**

*Waterfowl and Waders*

*Drawing Workshop*

*September 8, 2013*

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

Join celebrated artist, author, and educator John Muir Laws in this free drawing workshop at the refuge. Learn tricks and techniques to help you accurately and quickly draw migratory ducks and shorebirds. Program is recommended for those 10 years and up. Paper and pencils will be provided, or bring your own. Bring binoculars. A limited number of binoculars are available for borrow. Program takes place outside in a covered pavilion. Reservations Required. Register at [johnmuirlawswkshp.eventbrite.com](http://johnmuirlawswkshp.eventbrite.com) or call 510-792-0222 ext. 476.



<http://www.johnmuirlaws.com>

1 Marshlands Rd. Fremont, CA 94555 • [http://www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay](http://www.fws.gov/refuge/don_edwards_san_francisco_bay)



Don Edwards San Francisco Bay National Wildlife Refuge  
Presents

***Coastal Cleanup Day***

Dumbarton Fishing Pier Parking Lot

Marshlands Rd, Fremont

Saturday, September 21, 2013

8:30 a.m. - 12:00 p.m.

Help wildlife and the environment! You can either remove invasive weeds or pick up trash along the parking lot and trails. We'll supply disposable gloves (or, better yet, bring your own) and trash and recycling bags. You supply energy, sturdy shoes, sun protection, and clothes you don't mind getting dirty. Bring a reusable water bottle.

No reservations necessary.

Children under age 18 must have parental approval. Children under the age of 16 must be accompanied by an adult. To expedite the registration process, log on to [http://www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay](http://www.fws.gov/refuge/don_edwards_san_francisco_bay) to download the forms and bring to the registration table. Forms are also available at the registration table.

# 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 1, 2013 and June 31, 2013. These gifts will be used for publishing Tideline, capital, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.*

## Employer Matching Gift Program

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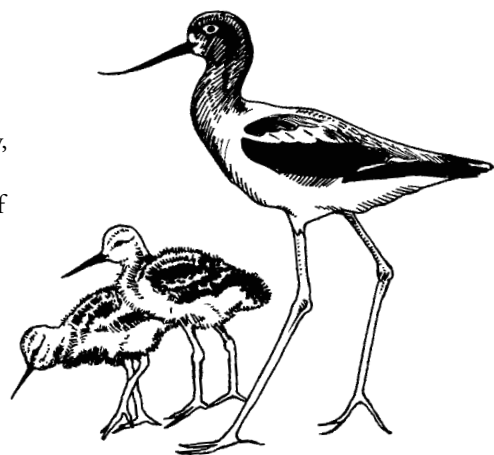
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## Help Us Help the Refuge

**Mail your donation to: San Francisco Bay Wildlife Society, P.O. Box 234, Newark, CA 94560.  
You may also become a member at [www.sfbws.com](http://www.sfbws.com).**

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

San Francisco Bay Wildlife Society is a not-for-profit 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"/> \$200 Corporation | <input type="checkbox"/> \$500 Sustainer |
| <input type="checkbox"/> \$35 Individual     | <input type="checkbox"/> \$75 Supporter | <input type="checkbox"/> \$250 Sponsor     | <input type="checkbox"/> \$1,000 Leader    |  |

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Phone \_\_\_\_\_ **Thank you for your support!**



# A Big Shout Out to Glenmore School K-1 Kindergarten Class of 2013

K-1 Kindergarten of Glenmore School in Fremont wanted to help the environment. They collected all the glass, aluminum, and plastic that they could find and recycled them at the local recycling center. Taking their altruism one step further, they donated the money collected from the recycling to the San Francisco Bay Wildlife Society to be used for environmental educa-

tion programs at the Don Edwards San Francisco Bay National Wildlife Refuge in Fremont. San Francisco Bay Wildlife Society Interpretive Specialist, Jennifer Fraga, and Don Edwards Refuge Park Ranger, Jose Garcia, went to the class to receive the check on behalf of the San Francisco Bay Wildlife Society. A big thank you to the K-1 Kindergarten class of Glenmore School!



*Interpretive Specialist Jennifer Fraga shows the check from Glenmore School.*

Ohlone Audubon and the Don Edwards NWR

## LaRiviere Marsh Celebration

Saturday, October 5, 2013

The LaRiviere Marsh trail is looking better than ever! Help us celebrate the trail upgrades and the new viewing platform donated by Ohlone Audubon.

- 9:00 a.m. Family Bird Walk. Share nature with your children. RSVP required. 510-792-0222 x363 \*
- 9:00 a.m. Adult Bird Walk. Enjoy the trails and practice your birding skills. No RSVP required. \*
- 11:30 a.m. Dedication Ceremony and Refreshments at the LaRiviere Marsh Viewing Platform.

\* These programs leave from the Visitor Center in Fremont.

National Wildlife Refuge Week  
October 13-19

## Annual Sale of Native Plants

Sunday, October 13, 2013  
10:00 a.m. – 2:00 p.m.

Help save water use by landscaping your yard with California native plants and attract hummingbirds and butterflies to your neighborhood. Sale will be held at the Visitor Center located at the first parking lot to your right.

Don Edwards San Francisco Bay  
National Wildlife Refuge  
2 Marshlands Rd  
Fremont, CA 94555

For more information, call Carmen Minch at 510-792-0222 ext. 476.



# Autumn Activity Schedule

Children under the age of 16 must be accompanied by an adult.

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

## September

### Sunday, September 1

#### World Water Monitoring Challenge Environmental Education Center, Alviso 11:00 a.m. – 12:00 p.m.

In September over 50,000 people around the world monitor their local water bodies. Are you up for the challenge? The primary goal of World Water Monitoring Challenge is to educate and engage citizens in the protection of the world's water resources. Many people are unaware of the impact their behaviors have on water quality. You'll be able to put your chemistry skills to use as you conduct simple monitoring tests and learn how to protect and keep your local watershed clean. Call 408-262-5513 ext. 104 for reservations.

### Saturday, September 7

#### \*Nature Walk for Health Visitor Center, Fremont 9:00 a.m. – 10:00 a.m.



Take a break from your busy schedule and refresh your spirit with nature at the refuge. Take a guided nature walk on the Tidelands Trail and hear what makes this National Wildlife Refuge unique. The 1 1/3 mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.

#### 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. Using a collection of old photographs, the last vestiges of a way of life such as salt production, the old railroads, and homes can be traced back to the 1850s that led to the construction of the town of Newark in 1876.

#### Shorebird Sleuths Environmental Education Center, Alviso 1:00 p.m. – 3:00 p.m.

Ever wonder what those birds are doing in the mud? What are they eating? How do they walk around on the muddy surface? Learn what it takes to be a shorebird and how they survive in what some consider a yucky place. Then head out and discover the different shorebirds that make their way through the refuge habitats. Maximum ratio of 1 adult for every 5 children. Space is limited to 20 people and program fills quickly. Call 408-262-5513 ext. 102.

### Sunday, September 8

#### \*Why Tides Matter Environmental Education Center, Alviso 10:00 a.m. – 11:00 a.m.

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

#### John Muir Laws Presents: Drawing Waterfowl and Waders Visitor Center, Fremont 1:00 p.m. – 3:00 p.m.



Learn tricks and techniques to help you accurately and quickly draw migratory ducks and shorebirds. We will cover essential aspects of bird anatomy that is relevant for the artist and then explore ways of quickly transferring what you see to the page. How do you draw those long legs on shorebirds? How do you draw shorebird and heron necks so that they do not just look like a bent garden hose? How do you capture the expression of a duck? All this and more. Bring binoculars. A limited number of binoculars are available to borrow. Paper and pencils provided, or bring your own. This program is recommended for ages 10 and up. Reservations required. Register at <http://johnmuirlawswkshp.eventbrite.com>

#### Drawbridge Van Excursion Environmental Education Center, Alviso 2:30 p.m. – 5:00 p.m.

There's a ghost town in the 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. We'll start with a slideshow, and then take a short van excursion to view Drawbridge across Coyote Creek. Program is intended for adults and space is very limited. RESERVATIONS ARE ESSENTIAL. Call 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 14

#### Bay Bike Ride Visitor Center, Fremont 10:00 a.m.

Go on an 11-mile bike ride with docent Gregg Aronson along Marshlands Road and on the Shoreline Trail to observe birds and the occasional leopard shark! Pass through several habitat types along the way. The paved and dirt trails are almost flat and trail and hybrid bicycles highly recommended. Helmets are required. Recommended for more experienced bicyclists. Program cancels if it rains the day before and the day of due to mud. Register at <http://donedwardsbike.eventbrite.com> or call 510-792-0222 ext. 362.

#### \*World of Butterflies Environmental Education Center, Alviso 1:30 p.m. – 3:00 p.m.

There are numerous types of flies including BUTTERFLIES. Join us for a lively discussion about butterfly life cycles, mating and eating habits. Learn the difference between butterflies, moths and skippers. Then take a leisurely walk through our butterfly garden to observe these amazing creatures. Open to all ages. Call 408-262-5513 ext 102 for reservations.

#### Twilight Marsh Walk Visitor Center, Fremont 6:30 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. Not suitable for young children. Register at <http://donedwardstwilight.eventbrite.com> or call 510-792-0222 ext. 362. Led by Mary and Gene Bobik.

### Saturday, September 21

#### Coastal Cleanup Meet at the Dumbarton Fishing Pier, Fremont 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 and a refillable water bottle if you have them. Children under 18 must have parental approval. Speed up the registration process by downloading and completing the Volunteer Agreement Form and bring it to the vent. For more information, call Carmen Minch at 510-792-0222 ext. 476.

#### \*Going Green, the Restoration of the South Bay Salt Ponds Environmental Education Center, Alviso 10:00 a.m. – 11:00 a.m.

Join an interpretive walk to photograph the wildlife and wetlands in the South Bay Salt Pond Restoration Project. Learn the history of the wetlands restoration. Knowing the area will increase your appreciation for the baylands and the ability to see them in whole new way. Discover plants and animals in its habitat and the best time to see them. Led by Joseph Garcia. Call 510-792-0222 ext. 141 for reservations.

#### Alviso Slough Cleanup Alviso Marina through the Alviso Slough 12:30 p.m. – 4:00 p.m.

Love to kayak? Love to clean up the environment? Why not combine the two and partner with Slough Keepers as they clean up Alviso Slough. Bring a kayak to the upper lot's boat ramp at the Alviso Marina and be prepared to paddle through the slough and into some reeds to clean up our waters. Kayaking experience highly recommended. Slough Keepers will provide garbage bags and garbage barges. To sign up, contact Eric Norris at [sloughkeepers@gmail.com](mailto:sloughkeepers@gmail.com) and visit [www.sloughkeepers.org](http://www.sloughkeepers.org) for more information. Space is limited to 25 kayakers.

### Saturday, September 28

#### Alviso Slough Trail – 9 mile-loop Meet at the Alviso Marina, Alviso 8:30 a.m.



This trail in Alviso is a 9-mile loop, flat, and level. The walk is self-paced and you may turn back at any time. Hats, water, and sunscreen are strongly recommended. There is no shade. No reservations are needed. Carmen Minch will be there to greet you at 8:30 a.m. 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 you to the Alviso Marina. Meet in the picnic table area adjacent to the restrooms.

### **\*The Basics of Salt Pond Restoration**

**Environmental Education Center, Alviso**

**2:00 p.m. – 3:30 p.m.**

Learn about the salt pond restoration project with Jose Garcia. This ambitious project seeks to restore 15,100 acres of former industrial salt ponds to a mix of wetland habitats. An interactive talk will be in the auditorium and if weather permits, a walk on the 0.25-mile boardwalk trail and view the progress thus far. Call 510-792-0222 ext. 141 for more information.

### **5 Tools to Use to Find the Elusive Gray Fox**

**Visitor Center, Fremont**

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

Do you sometimes see paw prints in mud or scat (poop) on the trails and assume that a dog left it? It could be from something else. Come along with me and I will show you how to distinguish and identify the markings of a gray fox. Gain some insights into the fox's nature and their behavior during the walk. By the time we are through, you will have a set of "tools" you can use to identify the presence of foxes in any area that you are in. Bring a hat, binoculars, and good walking shoes.

## **Sunday, September 29**

### **Story Hunters**

**Visitor Center, Fremont**

**2:00 p.m. – 3:30 p.m.**

Discover what stories lie hidden on the Don Edwards Refuge in this series by Art Garibaldi. New coordinates will lead you to two new landmarks that embody the rich human history that helped shaped refuge lands. We'll begin with a brief introduction on how to use our GPS units. GPS units are available for loan. Register at <http://donedwardsstory.eventbrite.com> or call 510-792-0222 ext. 362.

# **October**

## **Saturday, October 5**

### **\*Nature Walk for Health**

**Visitor Center, Fremont**

**9:00 a.m. – 10:00 a.m.**



Take a break from your busy schedule and refresh your spirit with nature at the refuge.

Take a guided nature walk on the Tidelands Trail and hear what makes this National

Wildlife Refuge unique. The 1 1/3 mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.

### **\*Family Bird Walk**

**Visitor Center, Fremont**

**9:00 a.m. – 11:00 a.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. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Register at <http://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

### **\*Adult Birding Walk**

**Visitor Center, Fremont**

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

Fall is a great time to look for migrating birds at the refuge. Join Ohlone Audubon for a birding walk to see what birds are visiting. This is a great opportunity for new and experienced birders to practice their skills. For ages 16 and over.

### **All About Owls**

**Environmental Education Center, Alviso**

**1:30 p.m. – 3:00 p.m.**

Learn all that you've ever wanted to learn about owls here at the refuge. Where do owls eat? How do we not hear them when they flap their wings? Are owls the brainiacs of the bird world? Through an interactive presentation and owl pellet dissection, we'll find the answers to all these questions. Led by Paul Bridges. Call 408-262-5513 ext. 102 for reservations.

## **Sunday, October 6**

### **Science, Art, and the Changing Seasons**

**Environmental Education Center, Alviso**

**10:00 a.m. – 12:00 p.m.**

In this family-friendly program, explore how plants change with the seasons. Look carefully at our native plants and draw what you see. Help us create a field guide to our native plants showing seasonal changes. Learn how you can help scientists gather information about the seasons. Appropriate for all ages. Call 408-262-5513 ext. 102 for reservations.

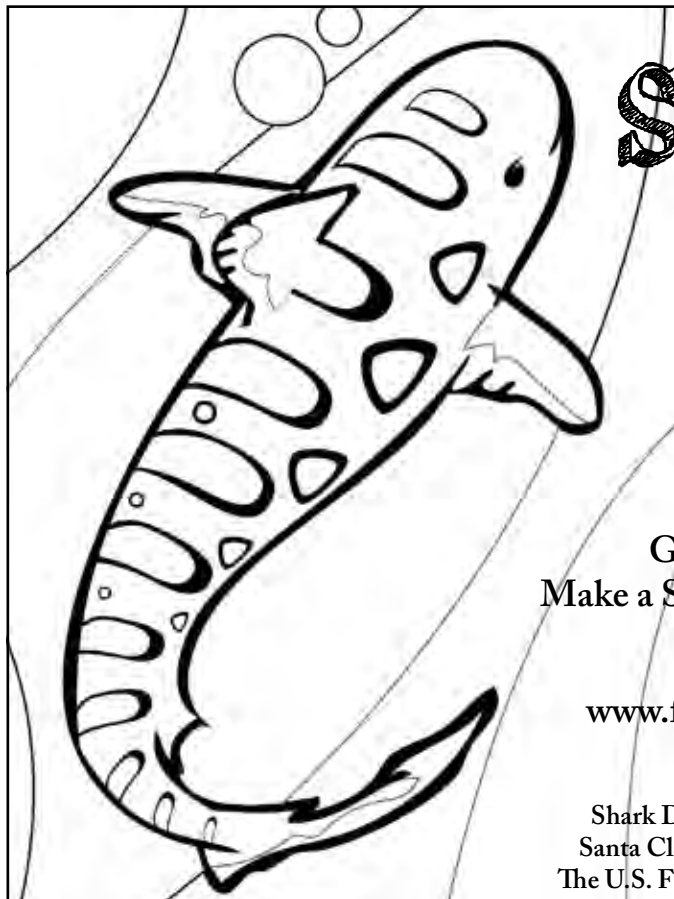
## **Saturday, October 12**

### **What are the Wetlands?**

**Environmental Education Center, Alviso**

**1:00 p.m. – 2:00 p.m.**

Fossils and flumes help teach children about the South Bay Salt Ponds Restoration Project. Park Ranger Jose Garcia brings fossils from Triassic wetlands he collected in eastern Montana to show the similarities to wetlands today, and explain their function in nature. Interactive flumes allow for a hands-on experience of how the wetlands protect the surrounding area from flooding. Call 510-792-0222 ext. 141 for reservations.



# **SHARK DAY**

**SATURDAY, OCTOBER 19**

**12:00 - 3:00 P.M.**

**at the Don Edward San Francisco Bay  
National Wildlife Refuge's  
Environmental Education Center in Alviso**

## **FREE ACTIVITIES**

**Guided Walks • Games & Crafts • Face Painting  
Make a Shark Tooth Necklace • Pet Live Leopard Sharks**

**For directions and more information:**

**[www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay/](http://www.fws.gov/refuge/don_edwards_san_francisco_bay/)  
or call 408-262-5513**

**Shark Day is sponsored by: The City of San Jose (Living Wetlands Program),  
Santa Clara Valley Urban Runoff Prevention Program (Watershed Watchers),  
The U.S. Fish and Wildlife Service, and the San Francisco Bay Wildlife Society.**

# Autumn Activity Schedule

Children under the age of 16 must be accompanied by an adult.

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

## National Wildlife Refuge Week Oct 13-19

Sunday, October 13

**Make Way for Science Day**  
Meet at the Visitor Center, Fremont  
7:00 a.m. - 4:00 p.m.

The Don Edwards San Francisco Bay National Wildlife Refuge is gathering scientists and naturalists to introduce you to scientific data collection and land management techniques on national wildlife refuges. Meet the experts and see what they do first-hand. Train to be a citizen scientist and help monitor plants and animals on the refuge to document effects of climate change. See page 6 for more information. A complete schedule will be available on our web site October 1. [http://www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay](http://www.fws.gov/refuge/don_edwards_san_francisco_bay)

**Native Plant Sale**  
Visitor Center, Fremont  
10:00 a.m. - 2:00 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.

Saturday, October 19

**Tidelands Trail/LaRiviere Marsh Walk - 1.5 miles**

Visitor Center, Fremont  
10:00 a.m.

**Let's Go Outside!**  
This is the eighth and final walk featured in the Refuge Rambler club. If you've completed seven out of eight walks in the series, congratulations! Be sure to bring your passport to the Visitor Center for your free All-Star T-shirt! This trail is 1.5 miles. The walk is self-paced and you may turn back at any time. 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 10:00 a.m.

**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. Not suitable for young children. Register at <http://donedwardstwilligt.eventbrite.com> or call 510-792-0222 ext. 362. Led by Mary and Gene Bobik.

Sunday, October 20

**Geology Walk of the Coyote Hills**  
Visitor Center, Fremont  
2:00 p.m. - 3:00 p.m.

Ever wonder what the dirt on the trail is made of, what the rocks are by the shore, and how wetlands are created? Join Park Ranger Jose Garcia at Coyote Hills as he deconstructs the area around you and explains how geology influences the landscape. Discover how knowledge of geology helps rebuild wildlife habitat and provides flood protection for us all. Cameras welcome. Trail is 1.3 miles and family friendly. Call 510-792-0222 ext. 141 for more information.

Saturday, October 26

**Habitat Exploration**  
Environmental Education Center, Alviso  
10:00 a.m. - 12:00 p.m.

Join us as we explore the five refuge habitats. We will look for various types of wildlife including insects, spiders and reptiles. With the fall season in progress we will discover how the change in season affects refuge plants and animals. Open to all ages but best suited for ages 7 and up. Call 408-262-5513 ext 102 for reservations.

**5 Tools to Use to Find the Elusive Gray Fox**  
Visitor Center, Fremont  
2:00 p.m. - 3:30 p.m.

Do you sometimes see paw prints in mud or scat (poop) on the trails and assume that a dog left it? It could be from something else. Come along with me and I will show you how to distinguish and identify the markings of a gray fox. Gain some insights into the fox's nature and their behavior during the walk. By the time we are through, you will have a set of "tools" you can use to identify the presence of foxes in any area that you are in. Bring a hat, binoculars, and good walking shoes.

Sunday, October 27

**Habitat Under Construction Bike Ride**  
Environmental Education Center, Alviso  
10:00 a.m.-12:00 p.m.

The South Bay Salt Pond Restoration Project is engaged in an effort to convert former salt ponds into lands for wildlife habitat, wildlife-oriented recreation, and natural flood protection. Join Park Ranger Jose Garcia in this bike ride and learn about the structure of different habitats which make up the bay front. Helmets required. Water and safety gear recommended. A PowerPoint will be substituted in case of inclement weather. Call 510-792-0222 ext. 141 for more information.

**Story Hunters**  
Visitor Center, Fremont  
2:00 p.m. - 3:30 p.m.

Discover what stories lie hidden on the Don Edwards Refuge in this series by Art Garibaldi. New coordinates will lead you to two new landmarks that embody the rich human history that helped shaped refuge lands. We'll begin with a brief introduction on how to use our GPS units. GPS units are available for loan. This program is open to everyone. Call 510-792-0222 ext. 363 for reservations.

# November

Saturday, November 2

**Nature Walk for Health**  
Visitor Center, Fremont  
9:00 a.m. - 10:00 a.m.



Take a break from your busy schedule and refresh your spirit with nature at the refuge.

Take a guided nature walk on the Tidelands Trail and hear what makes this National Wildlife Refuge unique. The 1 1/3 mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.

**Beginning Bird Drawing**  
Environmental Education Center, Alviso  
11:00 a.m. - 12:30 p.m.



Learn how to draw birds, or just practice what you've already learned. Increase your confidence in drawing and develop skills to help you draw what you see. We will have a variety of mounted birds available for drawing and for observing bird anatomy. We will practice different techniques for getting proportions right. Appropriate for ages 8 to adult. Children, please bring an adult with you who would like to participate. Adults without children are also welcome. Bring a sketch pad and pencil or use ours. All skill levels welcome. Call 408-262-5513 ext. 102 for reservations.

help you draw what you see. We will have a variety of mounted birds available for drawing and for observing bird anatomy. We will practice different techniques for getting proportions right. Appropriate for ages 8 to adult. Children, please bring an adult with you who would like to participate. Adults without children are also welcome. Bring a sketch pad and pencil or use ours. All skill levels welcome. Call 408-262-5513 ext. 102 for reservations.

**Intermediate Bird Drawing**  
Environmental Education Center, Alviso  
1:30 p.m. - 3:00 p.m.

Learn techniques to help your bird drawings come to life! The earlier class emphasized quick sketches and basic shapes while this class will emphasize the 3-dimensional form. It will provide more advanced techniques. Appropriate for ages 8 to adult. Children, please bring an adult with you who would like to participate. Adults without children are also welcome. Bring a sketch pad and pencil or use ours. All skill levels welcome. Call 408-262-5513 ext. 102 for reservations.

Sunday, November 3

**\*Bird Watching for Beginners**  
Visitor Center, Fremont  
9:30 a.m. - 11:30 a.m.

Millions of birds migrate through the Don Edwards Refuge every year. In this beginner's program, we will go over the use of binoculars, how to use a bird guide, and identify the birds we see on the trail. Recommended for ages 10 and up. Dress for the weather and wear comfortable shoes. Heavy rain cancels. Led by Carmen Minch.

**Geology Walk of the Coyote Hills**  
Visitor Center, Fremont  
2:00 p.m. - 3:00 p.m.

Ever wonder what the dirt on the trail is made of, what the rocks are by the shore, and how wetlands are created? Join Park Ranger Jose Garcia at Coyote Hills as he deconstructs the area around you and explains how geology influences the landscape. Discover how knowledge of geology helps rebuild wildlife habitat and provides flood protection for us all. Cameras welcome. Trail is 1.3 miles and family friendly. Call 510-792-0222 ext. 141 for more information.

## Saturday, November 9

### Twilight Marsh Walk

Visitor Center, Fremont

4:00 p.m. – 5:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. Register at <http://donedwardstwilight.eventbrite.com> or call 510-792-0222 ext. 362. Led by Mary and Gene Bobik.

## Sunday, November 10

### \*Salt Marsh Walk

Visitor Center, Fremont

10:30 a.m. – 12:00 p.m.

Take a walk with docent Gregg Aronson around the wetlands of the wildlife refuge and learn about their history. See examples of salt collection ponds and learn what is being done to convert them back to their original, natural salt marsh state. Hear how wildlife is affected by the two types of habitat, and why it is important to control the rate of conversion from salt ponds back to the salt marshes. Binoculars and/or a camera are recommended. Register at <http://donedwardssaltmarsh.eventbrite.com> or call 510-792-0222 ext. 362.

## Saturday, November 16

### \*Beginning Bird Watching

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

This will be a great way to learn about many local and migratory birds. Ceal Craig will start with a slideshow indoors to show you how to recognize the regulars, then you can borrow a pair of binoculars and take a walk to try out your new skills. All ages welcome. Reservations required. Call 408-262-5513 ext. 102.

### \*Living Wetlands

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

Our refuge consists of salt marsh, salt ponds, tidal and non-tidal sloughs that are teeming with life, both visible and non-visible to the naked eye. Come enjoy a slideshow and discussion depicting the life and death struggles of our marsh inhabitants and why the refuge wetlands are important to all of us. Weather and time permitting, we may take a short walk to view our wetlands. Open to all but best suited for ages 9 and up. Call 408-262-5513 ext 102 for reservations.

### \*Family Bird Walk

Visitor Center, Fremont

2:00 p.m. – 4:00 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. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Register at <http://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

## Sunday, November 17

### Story Hunters

Visitor Center, Fremont

2:00 p.m. – 3:30 p.m.

Discover what stories lie hidden on the Don Edwards Refuge in this series by Art Garibaldi. New coordinates will lead you to two new landmarks that embody the rich human history that helped shaped refuge lands. We'll

begin with a brief introduction on how to use our GPS units. GPS units are available for loan. This program is open to everyone. Register at <http://donedwardsstory.eventbrite.com> or call 510-792-0222 ext. 362.

## Saturday, November 23

### Gardening at the EEC

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

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

### 5 Tools to Use to Find the

### Elusive Gray Fox

Visitor Center, Fremont

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

Do you sometimes see paw prints in mud or scat (poop) on the trails and assume that a dog left it? It could be from something else. Come along with me and I will show you how to distinguish and identify the markings of a gray fox. Gain some insights into the fox's nature and their behavior during the walk. By the time we are through, you will have a set of "tools" you can use to identify the presence of foxes in any area that you are in. Bring a hat, binoculars, and good walking shoes.

### \*The Basics of Salt Pond Restoration

Environmental Education Center, Alviso

2:00 p.m. – 3:30 p.m.

Learn about the salt pond restoration project with Jose Garcia. This ambitious project seeks to restore 15,100 acres of former industrial salt ponds to a mix of wetland habitats. An interactive talk will be in the Environmental Education Center auditorium and if weather permits, a walk on the 0.25-mile trail and view the progress thus far. Call 510-792-0222 ext. 141 for more information.

## Sunday, November 24

### Chompers and Stompers

Environmental Education Center, Alviso

2:00 p.m. – 3:30 p.m.

Ever wondered why birds come in so many shapes, sizes, and colors? Come find out why some birds exhibit wacky behaviors. We will examine different bird specimens we have collected over the years to see how birds have adapted some extraordinary features. Then take a guided walk around the refuge to see these marvelous creatures in action. RESERVATIONS RECOMMENDED – All ages are welcome. Call 408-262-5513 ext. 104.

## Saturday, November 30

### \*Bird Migration Walk

Ravenswood Unit (SF2), Menlo Park

1:00 p.m. – 2:30 p.m.

Our wetlands are an important stop on the Pacific Flyway, a major bird migration route. Stroll with docent Laurel Stell to learn why the birds migrate, why they stop along the San Francisco Bay, and to spot the birds in action. Trail is easy and level. All ages and abilities welcome. Meet at the SF2 trail parking area on the west side of the Dumbarton Bridge. For information and directions, call 510-792-0222 ext. 141.

## Scout and Youth Group Programs

The Don Edwards San Francisco Bay National Wildlife Refuge offers free hands-on, programs for youths. During the programs participants learn about endangered species, migratory birds, wetland habitats, and the relationship between personal habits and their effects on the San Francisco Bay. These programs are designed to meet badge/patch requirements of Scout Groups, but anyone can participate. Because of the popularity of such programs, reservations are required. Children under the age of 16 must be accompanied by an adult. Badges are not provided.

Below are the names, dates, and descriptions of the programs. Programs at the Environmental Education Center are sponsored by the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Francisco Bay Wildlife Society.

### Youth Group Programs at the Environmental Education Center in Alviso

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

#### Webelos Naturalist Badge

Saturday, September 7 10:00 a.m. – 12:00 p.m.

Saturday, September 14 10:30 a.m. – 12:30 p.m.

Saturday, October 5 10:00 a.m. – 12:00 p.m.

Saturday, November 23 2:00 p.m. - 4:00 p.m.

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

#### \*Brownie Eco-Explorer Try-It Patch

Saturday, October 5 3:30 p.m. – 5:00 p.m.

Come and learn about habitats, food chains, and how you can help wildlife. Then take a walk to explore the habitats at the South Bay. We'll have a special craft to round out the day.

### Youth Group Programs at the Headquarters in Fremont

The Refuge Headquarters offer Webelos programs for up to 15 Webelos. Register at <http://donedwardswebelos.eventbrite.com> All programs are led by June Smith.

#### Webelos Naturalist Program

Sunday, October 6

Saturday, November 9

10:00 a.m. – 12:30 p.m.

Attention Webelos! Earn your naturalist badge in just 2.5 hours. During this hike, learn about birds, flyways, food chains, and the importance of wetlands. Bring your binoculars, or borrow one of ours.

# Field Trips to the Refuge

## General Education Program Information

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

Educators and adult leaders conduct their own field trips after attending a Field Trip Workshop. The workshops allow you to design and conduct your own field trip. In addition, adult volunteers must be recruited to lead the activities at the different learning stations and to chaperone the rotation groups of students. We provide easy to follow "scripts" for each station, but both "leaders" and "chaperones" are strongly encouraged to attend a Field Trip Workshop. New teachers must attend a Field Trip Workshop. Location of activities and trail conditions may vary. Please call for accessibility information.

### CHANGES TO THE WETLAND ROUND-UP FIELD TRIP PROGRAM – FREMONT ONLY

#### Field Trips at Learning Center in Fremont

**Wetland Round-Up Field Trips** – WE WILL NOT BE OFFERING THE WETLAND ROUND-UP PROGRAM IN THE FALL 2013. Details about scheduling a Spring 2014 field trip will be posted on our website on November 19, 2013 and in the Winter issue of *Tideline*.

Contact the Environmental Education Staff at Fremont:

Office: (510) 792-0222 x 475

Cell: (510) 377-7269

E-mail: ee.hq.intern@gmail.com

#### Field Trips at the Environmental Education Center in Alviso

**Wetland Round-Up Field Trips** - Investigate the butterflies in the butterfly garden, taste pickleweed in the salt marsh, or discover the creatures that live in the slough and salt pond water on a Wetland Round-Up Field Trip. This field trip program is designed for up to 65 students in grades K-6. This fall, Wetland Round-Up is offered October to December 2013.

### NEW! NEW! NEW! MAIL IN REGISTRATION!!

**Mail-in registration for Fall 2013 (October - December) will begin on Monday, August 26, 2013. Here's how it works:**

- Registration Forms will be available on-line at [http://www.fws.gov/refuge/Don\\_Edwards\\_San\\_Francisco\\_Bay/WetlandRoundUp\\_Alviso.html](http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/WetlandRoundUp_Alviso.html)
- You will be able to choose from a list of available dates and indicate your 1st, 2nd and 3rd choices on the form. Please make sure ALL these dates are good ones as availability may be more limited this year.
- PLEASE NOTE! Completed field trip registration forms should be mailed to our office in the following manner:

U.S. Fish and Wildlife Service  
P.O. Box 411  
Alviso, CA, 95002  
WRFT Registration/ EE attn: Genie

*We will not be accepting electronic versions of the forms at this time.*

- All forms received will be opened on Thursday, September 12, 2013.
- Every effort will be made to accommodate your requests. However, we may need to offer alternative dates if we cannot assign you your preferred dates.
- Selections will be made in a timely fashion. You will be notified by your preferred method as indicated on your form.
- We will continue to take requests after September 12, 2013 until all available dates for the Fall season (October - December) have been filled.
- Details about Spring 2014 registration will be in the Winter issue of *Tideline* and also posted on our website by November 19, 2013.

### Wetland Round-Up Field Trip Training Workshops

**New Teachers** who have not yet attended a field trip orientation must attend the training. The workshops are offered from 4 p.m. – 6:45 p.m. on select weekdays in the fall.

We highly recommend that returning **Teachers accompany Parent Leaders and Chaperones** to a workshop prior to your field trip. The workshops are offered from 4 p.m. – 6 p.m. on select weekdays in the fall.

The workshop dates will be announced on-line with the Field Trip Registration information (see above).

For more information call the Environmental Education Staff at Alviso:

Office: 408-262-5513 ext 100

Email: [genie\\_moore@fws.gov](mailto:genie_moore@fws.gov)

# Living Wetlands Program

Living Wetlands provides a first-hand learning environment for students and educators to explore the topics of watershed health, wetlands, and habitat preservation. Activities and presentations focus on the relationship between personal habits and their effects on their local wetlands. Living Wetlands is an environmental education program offered at no cost through the cooperative efforts of the City of San Jose, U.S. Fish and Wildlife Service, and the San Francisco Bay Wildlife Society.

## Program Offerings:

**5th – 12th grades:** Integrated Field Trip Program – This program incorporates multiple activities related to wetlands and watershed health. Participating classes will receive one pre-classroom presentation from Living Wetlands educators, a field trip to the Don Edwards Refuge, and one post-classroom presentation all including hands-on activities and demonstrations. For the Integrated Program, participating classes must be from the following cities: San Jose, Alviso, Milpitas, Santa Clara, Saratoga, Monte Sereno, Los Gatos, Campbell, and Cupertino. There is a limitation to 60 students per field trip, and a 1:10 chaperone to student ratio is required.

**5th – 12th grades:** Classroom Presentations – Presentations include an in-depth look at the habitats of the south bay along with the pathways of indoor and outdoor water use. Students will have a better understanding of the role they play in the health of their watershed and what personal actions they can take to help. The presentation takes approximately one hour. Please contact us for specific classroom presentation needs.

**Other Schools, Colleges, Universities, and related organizations:** - Field Trip and Guided Tours – General field trips and guided tours are available and generally last 1.5 hrs. in length.

Educators are encouraged to contact us to discuss options for customizing field trips and classroom presentations. Reservations for the Living Wetlands program are on a first-come basis. For more information, or to make a reservation, call the Living Wetlands Program Coordinator at 408-262-5513 ext 104 or email at [livingwetlands@sfbws.com](mailto:livingwetlands@sfbws.com).



## TIDELINE

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### San Francisco Bay National Wildlife Refuge Complex

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

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 Don Edwards Warm Springs Unit Manager: .. Ivette Loreda  
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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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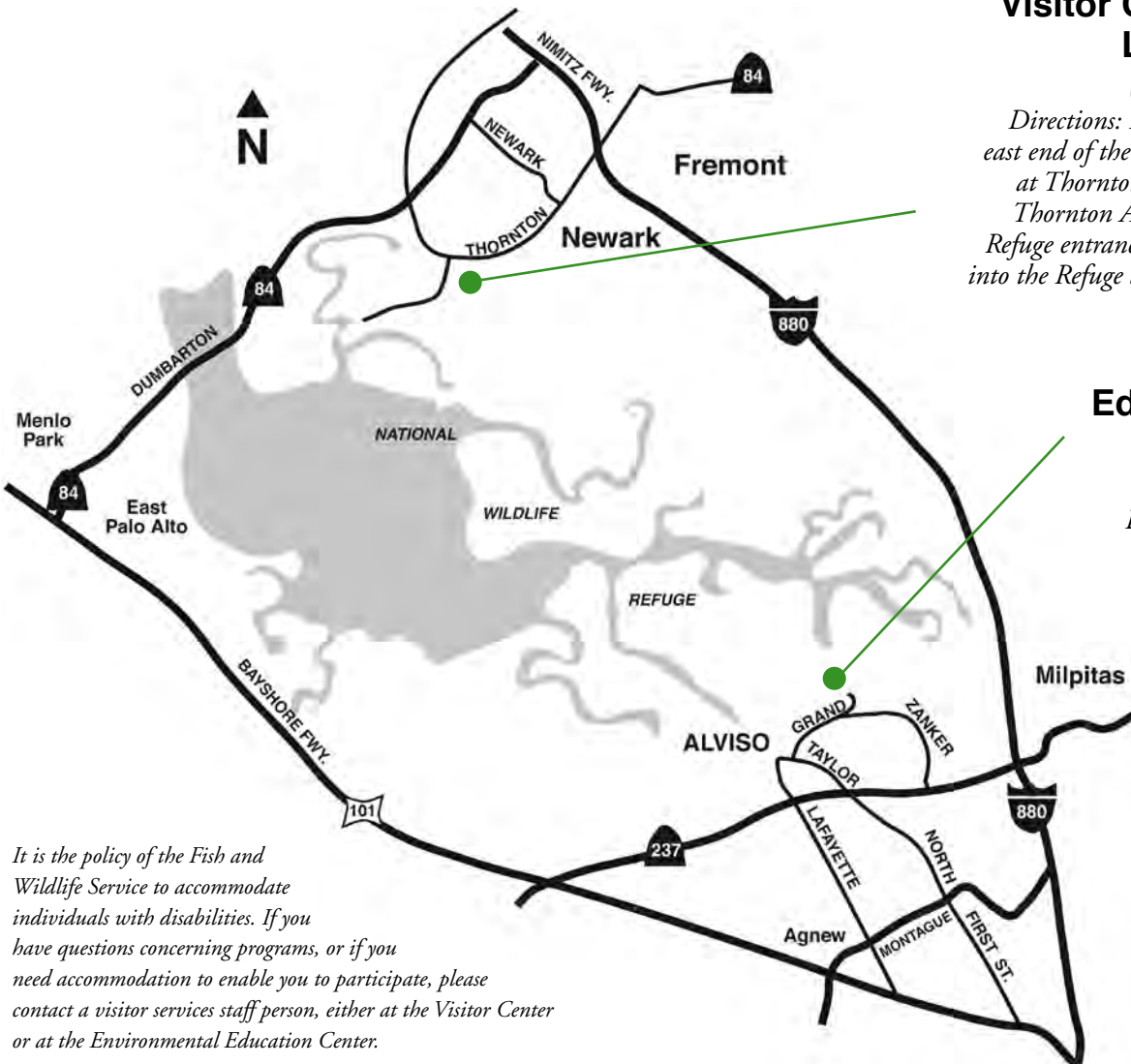
# Tideline



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### Visitor Center, Fremont Learning Center

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

### Environmental Education Center, Alviso

(408) 262-5513  
 Directions: From I-880 or Highway 101, exit on Highway 237 toward Mountain View/Alviso. Exit North 1st St. and head north. Turn right onto Nortech and then left onto Disk Dr. Turn right onto Grand Blvd.

*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.*