

Tideline



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

The Bird Formerly Known as California Clapper Rail

By James M. Maley, Ph.D.

There's a new species in town but you may already be familiar with it. You may not realize it, but the secretive, endangered, and charismatic bird you knew as the California Clapper Rail has been renamed the Ridgway's Rail.

The name change does not represent a loss of anything. In fact, it makes our rails much more unique and advances our understanding of bird relationships. The name Ridgway's Rail is an honorific, or patronym, that is intended to reflect the tremendous contribution to the understanding of North American birds made by Robert Ridgway.

Given new information, the old name doesn't work for several reasons. There have always been questions about the relationships among the big rails of the Americas in ornithological circles. Understanding how these birds were first identified and described can help explain the science and reasoning behind the name change and the splitting of the King and Clapper rail complex. In addition, I'll explain how our research that included DNA sequencing prompted changes to the number of species in the King and Clapper Rail group.

Traditionally, there were two species of large rails in the Americas. The Clapper Rail was found along the Atlantic, Pacific, and Gulf coastlines of North America, throughout the Caribbean, and along both coasts of South America. The King Rail was found in freshwater marshes of eastern North America, Cuba, and the highlands

of Mexico. The North American Check-list Committee of the American Ornithologists' Union split these two species into five species in July 2014 based on the research I conducted with Dr. Robb Brumfield at Louisiana State University Museum of Natural Science.

later decided that this was the same species as the one described by Boddaert, so it was considered a subspecies of Clapper Rail.

John James Audubon described the next member of the group in 1834, King Rail, based on birds he found in Camden,



Rails in California were originally lumped with the clapper rails because they breed in salt water habitats. Photo: Aric Crabb, Bay Area News Group

The original Clapper Rail was described in 1789 by Pieter Boddaert, a Dutch scientist, based on a specimen from mangrove forests of Cayenne in French Guiana, South America. German naturalist Johann Gmelin described another large rail that same year from Long Island. It was

New Jersey. It wasn't until 1874 that any other rails were described in the group. Robert Ridgway described the birds of San Francisco Bay as a subspecies of King Rail. He also described the birds of the highlands

continued next page

of central Mexico as a subspecies of King Rail. Over the course of the next 140 years, many new subspecies were described from throughout the extensive distribution of these birds.

There was much confusion and debate about how many species there actually were, and which subspecies belonged with which species. Thus, at some point, the birds in California switched from being considered King Rails to Clapper Rails.

Why has there been so much confusion about which species occurs here in California? It has to do with the habitat the birds are found in and the color of their feathers. Clapper Rails of eastern North America are the most well known of the entire species group because they occur at high densities near major population centers. They are also game birds that continue to be hunted today. They spend their entire lives in salt marshes, much like the birds along the California coastlines.

In contrast, King Rails of eastern North America breed exclusively in freshwater marshes. So, just by habitat, we would consider the birds in California as most similar to Clapper Rails. In coloration, the birds in California are much more similar to King Rails than Clapper Rails. They share a bright reddish-orange breast and upper wing. Prior to our genetic research, habitat trumped coloration and they were considered Clapper Rails, even though the evidence was conflicting.

What is a species versus a subspecies? A species is defined as a population of interbreeding organisms that are reproductively isolated from other populations. Reproductively isolated means that either they can't have hybrids with other closely related populations, or the hybrids don't survive.

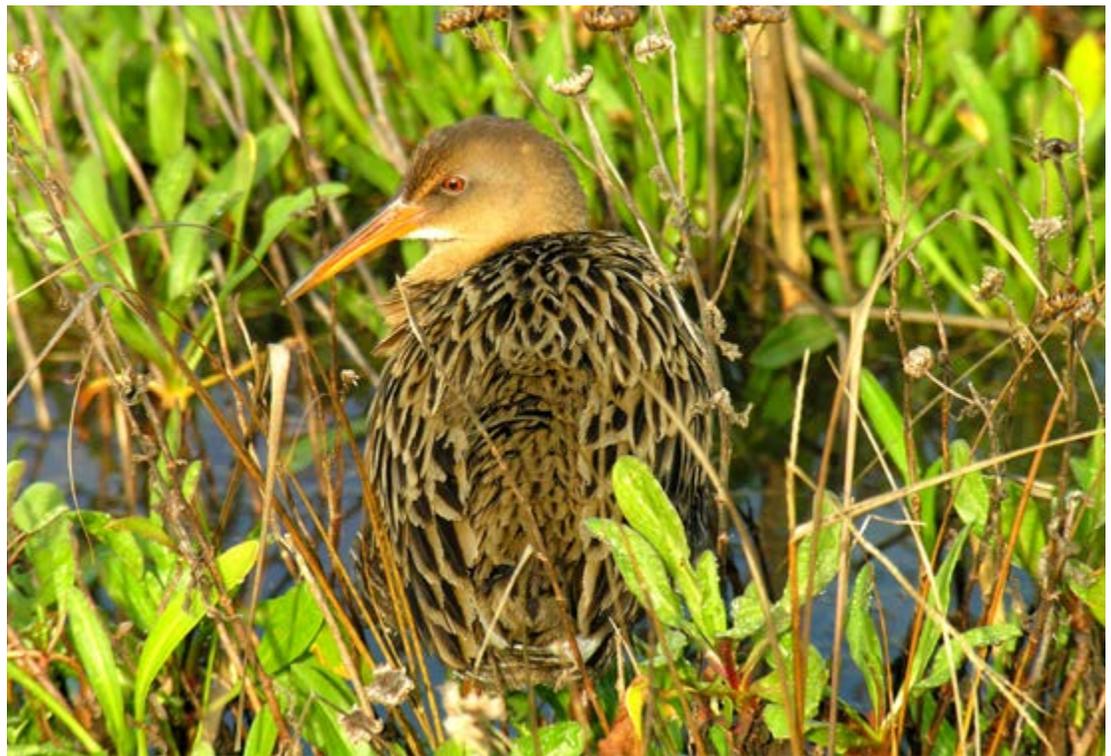
A subspecies is considered a distinct

form of a species that is likely not reproductively isolated from other populations, but is diagnosably distinct in some characters. Many birders can easily recognize different subspecies of birds, such as Yellow-shafted and Red-shafted flickers. Where flickers overlap in the Great Plains they hybridize freely, so even though they were once considered different species they are not any longer. There is no way to directly test whether rails from California would breed with birds from Long Island, but we can make an assessment by comparing the California rails to other cases where two species do come together and hybridize.

When I started my Ph.D. with Robb Brumfield at Louisiana State University

during the spring migrations can be an incredible experience. You can see hundreds of adult male Bay-breasted Warblers in a small patch of forest, feeding and resting after their long journey from the Yucatan Peninsula. These small woodlots are found near marshes, so we would also look for waterbirds. We frequently found rails that looked like hybrids between King and Clapper rails. Upon research I realized that nobody had done a genetic study on hybridization in the rails. This fit my interests perfectly because King Rails breed in freshwater marshes while Clapper Rails breed in salt marshes.

As I looked further, I found that not only had no one investigated what was



The coloration of the California rails were more similar to king rails on the east coast. Photo by Chris Cochems

(LSU) in 2006 I was looking for a research project. LSU is one of the world's best institutions for ornithology, and most students work on birds in South America. I tried my hand at research in the tropics in 2008 but unfortunately came back with a nasty flesh-eating parasite that took months of treatment to cure. I decided to look closer to home for birds to study. A particular interest of mine is the role that adaptations to saltwater versus freshwater might play in bird evolution.

Bird watching in southwest Louisiana

going on with the rail hybrids, neither had anyone done a thorough genetic study of all the large rails in the Americas. No scientists had sequenced the DNA of California rails and eastern rails to see whether they were King Rails or Clapper Rails. So, before I studied the hybrid zone, it seemed useful to try and figure out the genetic relationships of the entire group.

I was able to obtain samples from natural history collections because of the previous work of naturalists, scientists, and volunteers that collect or salvage scientific specimens. Some birds from California had



*Distribution of the Aztec, Clapper, King, Mangrove, and Ridgway's Rails.
Courtesy of James M. Maley, Ph.D.*

been found dead and fortunately given to museums. For some populations, no recent specimens had been collected, but I was able to get degraded DNA from small cuttings of skin from the toes of old specimens.

A considerable amount of time was spent extracting and sequencing DNA from tissue or small chunks of skin. The analyses yielded some surprising results. It turned out that King Rails and Clapper Rails in Louisiana are more closely related to each other than either is to the Clapper Rails of California! I sequenced some old specimens of King Rails from the central highlands of Mexico and these turned out to be the closest relatives of California Clapper Rails!

Because we like our taxonomy to reflect something about evolutionary history, there were two options based on these genetic results: we could lump everything so there was only one species, which had been done previously, or we could split everything up. Whether we split them up depended on the question of hybridization. If King Rails and Clapper Rails of eastern North America freely hybridize where they come into contact then everything should be lumped. On the other hand, if hybridization was

limited, then each distinct population group should be split into their own species.

I spent many hot days in the marshes of southwestern Louisiana studying the hybrid zone. I encountered hostile locals, aggressive cottonmouths, and huge alligators with high frequency. I was fortunate to have the help of many people assisting me with permits and access to marshes.

I noticed that there were very rapid transitions from mostly King Rails to mostly Clapper Rails depending on the salinity of the marsh they were found in. I sequenced their DNA and measured water samples and found that this was true. The transition in salinity from saltwater to freshwater was about seven kilometers in southwest Louisiana, and this transition was roughly the same for DNA and the physical characteristics of the bird.

We can use the width of the transition to tell us about the nature of the hybridization. The width of this transition zone is narrower than any other bird hybrid zone that I know of, which means that hybrids are not very successful and don't persist well in the population. This low success of

hybrids indicates that the two populations are reproductively isolated, thus, we have to consider them different according to the definition of a species. Because we have to consider King and Clapper rails in the eastern US to be different species, then it makes the most sense to elevate the other populations that we also found to be genetically and physically distinct to species level.

After six years of work, Robb Brumfield and I published these results in the journal, *The Condor*, and then submitted a proposal to the North American Check-list Committee. The committee makes all decisions about splitting or lumping species. In July 2014, the committee agreed with our proposal and split the species.

The birds had all been described previously, so each species takes the scientific name that it was first described as, even if it was considered a subspecies at the time. We chose the common names and, despite some debate, the committee accepted them.

There were two choices for coming up with common names for the five species, we could come up with five new names or retain Clapper and King rail for the eastern birds, as this is what they have always been called. We chose to retain Clapper Rail and King Rail for the birds in eastern North America and the Caribbean for stability. We chose Mangrove Rail for the birds along the coastlines of South America, as these birds exclusively inhabit mangrove forest. We chose Aztec Rail for the birds of the highlands of Mexico, as their distribution closely matches the distribution of the former Aztec Empire. Finally, we chose Ridgway's Rail for the birds of California, Nevada, Arizona, and northwestern Mexico. This was to honor Robert Ridgway, who described this species and many other populations as new.

James M. Maley, PhD is currently the Collections Manager of the Moore Laboratory of Zoology at Occidental College in Los Angeles, CA. He continues to conduct research on rails and other birds, including Western Scrub-Jays, while helping manage the world's largest collection of Mexican birds.

Your Neighborhood Refuge

In a recent *New York Times* op-ed (*New West Renaissance*, August 29, 2014), writer Timothy Egan coined the phrase “a new-century ecosystem” in describing the West of today as “high-tech, young, more optimistic than other regions. And what gives joy, solace, relief and a thrill to the lives of so many Westerners is the one thing they all have in common: public land at their doorstep. There is no other place on earth like it.”

San Francisco Bay is clearly a new-century ecosystem that is distinguished by three major cities and hundreds of communities across nine counties surrounding a vibrant, thriving estuary and ringed by verdant hills and valleys. And intertwined within this vast cultural and natural landscape, at the doorstep of millions of people living in ethnically and economically diverse neighborhoods, are our National Wildlife Refuges.

As the nation’s first urban refuge emphasizing nature study and wildlife-oriented recreation, the Don Edwards San Francisco

Bay National Wildlife Refuge and its companion refuges have something unique to offer in this new-century ecosystem – lands and waters for place-based, hands-on, multi-sensory learning. Children - and many adults - learn best by experiencing a place, by touching, seeing, and doing. Through our environmental education and outreach programs, we strive to inspire urban dwellers to connect with nature and renew a sense of wonder.

Even so, a recent Refuge Visitor Satisfaction Survey (2012) revealed that our visitation does not necessarily reflect the ethnic and economic diversity of our neighboring communities, and this needs to change. In order to strengthen our relevancy for a diverse demography, we are seeking to expand our programs through the new Urban Wildlife Refuge Initiative, launched as part of the U.S. Fish and Wildlife Service’s vision for the National Wildlife Refuge System,

entitled *Conserving the Future*.

We envision a bold and comprehensive program that uses new tools, enhanced facilities, and stronger partnerships to provide more equity and inclusion across a continuum of engagement for youth,



adults, families, and community groups. We welcome you to join us and experience the wonders of nature at your doorstep. Because, there really is “no other place on earth” like San Francisco Bay.

For more information about the Urban Wildlife Refuge Initiative, visit <http://www.fws.gov/refuges/vision/urbanwildliferefugeinitiative.html>.

Litterati Art Exhibit Opening Reception Environmental Education Center, Alviso

Trash is everywhere. Soda cans, plastic bags, and cigarette butts litter the environment, choke wildlife, and threaten our planet. By combining technology, social awareness and art, the Litterati is tackling this ever-escalating problem one piece of litter at a time.



Friday, February 13 6:30 pm-8:30 pm

FREE Admission with complimentary refreshments

Provided by the San Francisco Bay Wildlife Society

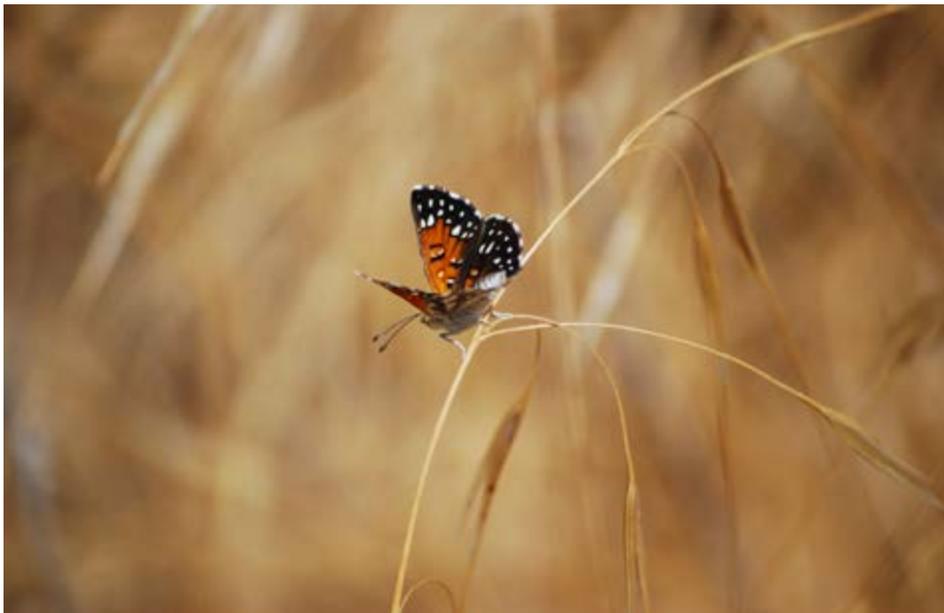
Space is limited, please register at: <http://litteratieec.eventbrite.com>

This planet we call home is a big place to keep clean. We all need to play our part.

Join the Litterati. www.litterati.org

Seven Things You May Not Have Known About the Refuges in the San Francisco Bay National Wildlife Refuge Complex

1 Three poachers were convicted in 1993 for poaching endangered insects including the Lange's metalmark butterflies at Antioch Dunes National Wildlife Refuge. The trio received a combination of monetary fines, hundreds of hours of community service, months of in-house imprisonment, and years of probation.



Top: The Santa Cruz Long-toed Salamander can emit sounds. Photo by Leah Oscar. Above: Lange's Metalmark Butterfly was the subject of poachers in the early 1990s. Photo by Susan Euing. Right: Not much is known about the Farallon Camel Cricket. Photo by Bryan White.



2 Two films, the 1971 cult classic *Harold and Maude* and a 1999 independent film *Dumbarton Bridge*, was partially filmed on what is now the Don Edwards San Francisco Bay National Wildlife Refuge. Familiar scenes of salt ponds are used as backdrop for the films.

3 Ellicott Slough National Wildlife Refuge was established to protect the Santa Cruz long-toed salamander, which can vocalize squeaks and clicks, possibly as a defense mechanism to startle predators into dropping them when captured.

4 There is an endemic cricket (*Farallonophilus cavernicolus*) on Farallon National Wildlife Refuge that lives nowhere else in the world. Researchers are currently studying the Farallon camel cricket.



5 The Marin Islands is named after Chief Marin, a Coast Miwok Native American who hid there trying to evade Spanish soldiers in the early 1800s.

6 Parts of what is now Salinas River National Wildlife Refuge were once used as a bombing range by the Navy.

7 Skaggs Island in San Pablo Bay National Wildlife Refuge is named after Marion Barton Skaggs whose family started the grocery store Safeway.

Teen Honored by Earth Island Institute for Creating Refuge's Junior Ranger Program

By Doug Cordell, Public Affairs Officer

Lynnea Shuck, a 17-year-old volunteer who created the Don Edwards San Francisco Bay National Wildlife Refuge's Junior Refuge Ranger program, has been named one of six youth leaders in North America to receive the Earth Island Institute's prestigious Brower Youth Award.

The awards, part of the Institute's New Leaders Initiative, recognize young environmental activists ages 13 to 22 for outstanding efforts to promote ecological sustainability and social justice.

Shuck, a senior at Mission San Jose High School in Fremont, Calif., has been volunteering with the refuge since 2010. She created her innovative Junior Refuge Ranger program in 2013, when she recognized an opportunity to more actively engage young people who, in turn, can become advocates for wildlife protection and the refuge system.

Shuck said her experiences as a young volunteer at the refuge inspired her effort to reach out to other young students.

"I started volunteering when I was in 7th grade and became totally hooked on refuges. It opened up a whole world of environmental awareness for me—I've grown so much as a person here and am so appreciative of what the refuge has to offer. I want to give young children the opportunity to have the same experiences I've had."

As part of her program, Shuck designed a 21-page activity book for 8-11 year-olds. The youngsters earn wildlife collector's cards for activities like nature hikes, bird counts, wildlife art, and interviews with rangers, managers and educational staff at the refuge. Some of the regular refuge programs that



Photo courtesy of Earth Island Institute

earn participants points are the Wetlands Water Café, All About Owls, World of Butterflies and Nocturnal Wonders. With completion of the activity booklet, youngsters receive a sticker and are certified as Junior Refuge Rangers.

Hands-on experience at the refuge is central to the program.

"It's one thing to learn about marsh plants in a classroom," Shuck said. "It's another to be standing in the marsh, touching the plants, and even tasting the pickleweed."

Besides being fun, the activities impart valuable lessons about refuges and the environment.

"I learned that no matter how old a kid is, they can learn really complicated concepts in environmental science if they are taught in the right way," Shuck notes. "This program demonstrates that environmental steward-

ship can be taught at any age."

Shuck is now working to expand the Junior Refuge Ranger program to other refuges, including California's Humboldt Bay National Wildlife Refuge and Sacramento National Wildlife Refuge Complex.

As part of her award, she and the other winners — who hail from Michigan, New York, Florida and Hawaii, and work on projects ranging from sustainable food security to prevention of marine debris — get a week of leadership training. Each also received \$3,000 funding for their programs.

The Brower Youth Awards were formally presented by the Earth Island Institute on October 21, 2014 at the Nourse Theater in San Francisco.

To see a short video on her project and what inspired her, go to <http://bit.ly/10OqKbZ>.

Alviso Slough Cleanup

DATES available at <http://sloughkeepers.com/joining-sloughkeepers>

Alviso Marina through the Alviso Slough

12:30 p.m. - 4:00 p.m.



Join your love of kayaking in the San Francisco Bay and a clean environment by participating with our partners the Slough Keepers in cleaning Alviso Slough. Bring a kayak out to the upper lot's launch ramp at the Alviso Marina and be prepared to paddle through the slough and some reeds to clean up our neighborhoods waters. Due to the reeds, this is recommended for those who have some kayaking experience. Slough Keepers will provide garbage bags and even some garbage barges. To sign up, contact Eric Norris at sloughkeepers@gmail.com and visit www.sloughkeepers.org for more information. Space is limited to 25 kayakers.

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

The Environmental Education Center offers five types of youth programs which are listed below. Email Julie at watershed-watchers@sfbws.com to schedule a date, and to customize your visit. *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.*

*Webelos Naturalist Badge

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.

Daisies Journeys

Journeys: 5 flowers, 4 stories, 3 cheers for animals (Sessions 1-6) Between earth and sky (Sessions 1-5)

Brownies Journeys and Badges

Journeys: WOW! Watching our Water: Life can't exist without water, neither can rainbows! Water does so much for you! Can you return the favor? On this journey you will take action by discovering how to love water, save water, and share water. Badges: (from WOW badge activity set): Household Elf: make a natural cleaner, water log on ways to save water, trash clean up, discover natural filters. Hiker: go over trail map, leave no trace, detective hike with birds.

Juniors Journeys and Badges

Journeys: Get Moving!: Are you prepared to use your energy to save the planet? On this Journey, you'll find out how to reduce your energy use, make buildings energy efficient, and create a plan to fix an energy problem in your community. Badges (from Get Moving badge activity set): Gardner: outdoor garden, native plant garden design, seasonal plants, seeds and soil, plant own native plant to take home. Badges (from aMUSE badge activity set): Animal Habitats: puppet show, explore 5 different habitats, make bird house, learn about endangered wetlands and animals, help clean up.

Cadet Journeys

Breath (Sessions 1 & 3)



Girl Scouts World Thinking Day

Saturday, February 21

**Environmental Education Center, Alviso
3:00 p.m. – 4:00 p.m.**

Be part of the global community. Each year on February 22, girls honor their sister Girl Guides and Girl Scouts on World Thinking Day by taking time to give thanks for their international friendships and recognize that Girl Scouts of the USA is part of a global community. The theme for World Thinking Day 2015 is "We can create peace through partnerships." Come to the refuge for a guided discussion about different ideas of peace and learn about what you can do to promote peace at home. **RESERVATIONS REQUIRED.** Go to <http://gswtd.eventbrite.com> Questions? Call Julie at 408-262-5513 ext.104 (Note: badges are not provided).

Youth Group Programs at the Refuge Headquarters in Fremont

The Refuge Headquarters offer Webelos programs for up to 15 Webelos. To register, call 510-792-0222 ext. 362 or at <https://donedwardswebelos.eventbrite.com>. Program is led by June Smith.

Webelos Naturalist Program

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.

Sunday, December 7

10:00 a.m. – 12:30 p.m.

Register at <http://www.donedwardswebelos.eventbrite.com> or call 510-792-0222 ext. 362

Sunday, February 22

10:00 a.m. – 12:30 p.m.

Register at <http://www.donedwardswebelos.eventbrite.com> or call 510-792-0222 ext. 362

Thank you San Francisco Bay Wildlife Society Donors!

We gratefully acknowledge the following donors who have made gifts to the San Francisco Bay Wildlife Society between July 1, 2014 and September 30, 2014. 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.

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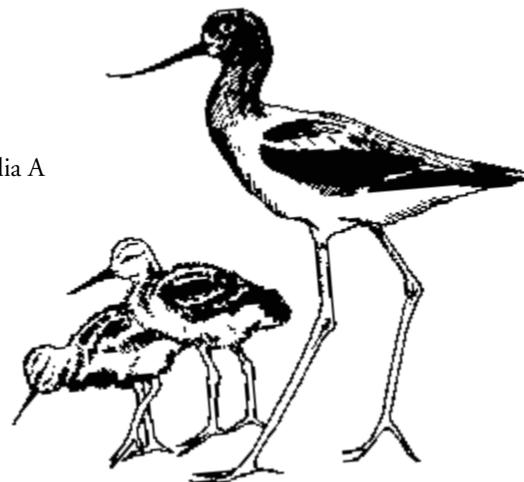
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Tri-City Ecology Center, David Epps, Susan Kozdon, Georgann Meadows, Julia A Paccioretti & Marge E Wood

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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.

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*. Enclosed is my contribution of:

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

Check For credit card payment, please use PayPal at www.sfbws.com/donate.

Signature _____

Name _____

Address _____ City _____ State _____ Zip _____

Phone _____

Thank you for your support!

A3 West Donation by Cargill

By Jill Singleton
Cargill Public Affairs Manager

The Don Edwards San Francisco Bay National Wildlife Refuge recently expanded by 50 acres and nearly two miles of levee roads, thanks to Cargill's donation of the A3 West Channel in Sunnyvale. The 50-acre donation includes the A3 West Channel and a paved road on the west side of Pond A3.

"There are no other lands like this anywhere along the South Bay," said Pat Mapelli, Cargill's Real Property Manager. "It is unique property that will provide extremely important public benefits and we are very pleased to place it in public ownership."

The A3 West Channel measures approximately 100-foot wide along its 1.5-mile length. The channel was built in the 1950s to move salt brines between Ponds A3W and A4, former commercial salt concentra-

tor ponds. It is often used by a variety of wildlife including great and snowy egrets, great blue herons, double-crested cormorants, ducks, coots, and Canada geese.

It is surrounded by two levees, one of which is paved. The paved levee connects Pond A3W (transferred to the Don Edwards Refuge in 2003 as part of the South Bay Salt Pond Restoration Project) and the Sunnyvale Water Pollution Control Plant, and provides all-weather access to hundreds of acres of wetlands and salt ponds along the South Bay.

Cargill originally offered to convey this property to the US Fish and Wildlife Service in 1999, when the company re-engineered

its 30,000-acre solar salt operations in the South Bay. The US Fish and Wildlife Service (USFWS), however, declined to accept the land due to the presence of two abandoned fuel pipelines, owned by NASA. NASA recently removed the pipelines, freeing up the property for wildlife usage.

In 2003, Cargill donated and sold 16,500 acres of former commercial salt ponds and associated properties to the US



Left: Area donated by Cargill. Above: Double-crested cormorants loafing in the A3 West Channel.

Fish and Wildlife Service and California Department of Fish and Wildlife (formerly CA Department of Fish and Game). That transaction, valued at \$200 million by the Internal Revenue Service, involved a \$100 million sale and a \$100 million donation in land value by Cargill. It also set the stage for the largest wetland restoration project on the West Coast, the South Bay Salt Pond Restoration Project – a biological and engineering plan that is expected to cost more than \$1 billion over the next 50 years.

Since 2003, Cargill has donated two more properties of significance: Pond SF2, a 252-acre former salt concentrator pond at the southwest take-off of the Dumbarton Bridge was donated in 2007 and in 2010 Cargill donated a 2.4-mile long levee (16 acres) near Moffett Field, linking segments of the Bay Trail from Menlo Park to Alviso.

Winter 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.

December

Saturday, December 6

*Nature Walk for Health



Visitor Center, Fremont
10:30 a.m. – 11:30 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 1.3-mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.

*Bird Drawing

Environmental Education Center, Alviso
11:00 a.m. – 12:30 p.m.

Learn how to draw birds. Increase your confidence in drawing and learn some 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 techniques for making life-like bird drawings and for getting the 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. RESERVATIONS REQUIRED. Go to <http://eecbirdd.eventbrite.com> Questions? Call Julie at 408-262-5513 ext.104.

The Basics of Salt Pond Restoration

Environmental Education Center, Alviso
1:00 p.m. – 2:30 p.m.

Learn about the South Bay Salt Pond Restoration Project with Park Ranger Jose Garcia at Don Edwards San Francisco Bay National Wildlife Refuge. This ambitious project seeks to restore 15,100 acres of former industrial salt ponds to wildlife habitat. This illustrated and interactive talk will be in the Environmental Education Centers auditorium and if weather permits, a walk on the 0.25-mile boardwalk trail and view the progress thus far. For any questions please contact Jose at 510-792-0222 ext. 141.

Sunday, December 7

Mallard Slough Hike

Environmental Education Center, Alviso
10:00 a.m.

Join Find Your Trail's founder Paul Salemme on another hike on the Mallard Slough Trail. This flat, level, trail surrounds a former salt pond slated for restoration, and the islands constructed in the middle of the pond attracts hundreds of wild birds. Don't forget your binoculars! Register at <http://donedwardsmallard.eventbrite.com> or call 510-792-0222 ext. 362.

*The Past, Present, and Future of the Don Edwards San Francisco Bay National Wildlife Refuge: Does the Past Hold Keys to the Future?

Environmental Education Center, Alviso
11:00 a.m. - 12:00 p.m.

Come learn about the history of this fascinating area as we walk along the salt marsh trails. Hear the interesting facts about the Don Edwards San Francisco Bay National Wildlife Refuge in the town of Alviso, and the old ghost town on the salt marsh called "Drawbridge." We will also take in views of the surrounding area and abundant wildlife along the way. Led by Pamela Delgado. Sign up at: <http://eecpastpresentandfuture.eventbrite.com>.

Marshland Homes

Environmental Education Center, Alviso
1:00 p.m. – 2:00 p.m.

Have you ever wondered where an animal lives? Or what it might live in? Come explore some different types of animal homes and shelters with Intern Colter Cook. Find out why so many creatures call Don Edwards SF Bay Refuge home by solving puzzles, playing games and even making your own bird nest! All ages are welcome. Register at <http://eecmarshlandhomes.eventbrite.com>.

Saturday, December 13

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 707-769-4200 for additional information and directions.

*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. Go to <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

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 (1.3 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.

Sunday, December 14

*Duck Walk

Visitor Center, Fremont
9:00 a.m. – 10:30 a.m.

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

Saturday, December 20

Community Service

Visitor Center, Fremont
9:30 a.m. – 12:00 p.m.

If you are interested in improving the refuge for visitors and for wildlife alike, join us at the Visitor Center for a community service project. We will do either a trash cleanup or a planting/weeding project. Dress appropriately for the task and for the weather. We will have gloves to lend and will provide the tools. Bring your own water bottle. Meet in the parking lot at the Visitor Center. Driving an additional 2.5 miles may be required since the project may be at a different location. For more information, or to make reservations, call 510-792-0222 ext. 361.

Sunday, December 21

*Salt Marsh Walk – Special King Tide Edition

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

On this date, the salt marsh will be inundated by king tides and it will be a site to behold. 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. Go to <http://donedwardsmarsh.eventbrite.com> or call 510-792-0222 ext. 362.

Saturday, December 27

Photographing Salt Ponds

Environmental Education Center, Alviso

10:00 a.m. – 11:00 a.m.

Find the magnificence in mud cracks, beauty in salt crystals, and of course birds! Join an interpretive walk to photograph the wildlife and wetlands in the South Bay Salt Pond Restoration Project. Learn and be a part of the history of wetland restoration. Seeing the area in a different way will increase your appreciation for its beauty, function, and role in the environment. Digital or film welcome. Led by Park Ranger Joseph Garcia. Call 510 792-0222 ext. 141 for reservations.

5 Tools You Can 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.

January

Saturday, January 3

*Nature Walk for Health

Visitor Center, Fremont

10:30 a.m. – 11:30 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 1.3-mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.

Saturday, January 10

*Marshlands of Dreams

Visitor Center, Fremont

9:30 a.m. – 10:30 a.m.

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

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 707-769-4200 for additional information and directions.

Salt Pond Perspectives

Environmental Education Center, Alviso

1:00 p.m. – 2:30 p.m.

Get the latest perspective on the Salt Ponds and the exciting restoration process. Get a handle on the habitats protected by restored wetlands which serve both animals and humans. Presented by docents from Santa Clara University. Call 510 792-0222 ext. 141 for more information.

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 (1.3 miles) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Go to <https://donedwardstwilight.eventbrite.com> or call 510-792-0222 ext 362. Led by Mary and Gene Bobik.

Sunday, January 11

*Bird Watching for Beginners

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

Thousands of birds winter on 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.

*Tiny Drifters

Environmental Education Center, Alviso

1:30 p.m. – 2:30 p.m.

There's plankton in our Bay! Learn about the different characteristics of plankton and how they have adapted to survive. We will become planktologists for a day, collect water samples and identify these incredible organisms under a microscope! All ages are welcome. Register at <http://eectinydrifters.eventbrite.com>.

Saturday, January 17

*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. Go to <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

Sunday, January 18

*Salt Marsh Walk – Special King Tide Edition

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

On this date, the salt marsh will be inundated by king tides and it will be a site to behold. 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. Go to <http://donedwardsmarsh.eventbrite.com> or call 510-792-0222 ext. 362.

Saturday, January 24

Community Service

Visitor Center, Fremont

9:30 a.m. – 12:00 p.m.

If you are interested in improving the refuge for visitors and for wildlife alike, join us at the Visitor Center for a community service project. We will do either a trash cleanup or a planting/weeding project. Dress appropriately for the task and for the weather. We will have gloves to lend and will provide the tools. Bring your own water bottle. Meet in the parking lot at the Visitor Center. Driving an additional 2.5 miles may be required since the project may be at a different location. For more information, or to make reservations, call 510-792-0222 ext. 361.

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 program by Art Garibaldi. After a brief introduction on how to use our GPS units, we'll give you a set of coordinates that will lead you to the landmarks that embody the rich human history that helped shaped refuge lands. GPS units are available for loan. Register at <http://donedwardsstory.eventbrite.com>.

Winter 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.

Saturday, January 24

Night Sky Party!

Environmental Education Center, Alviso

6:30 p.m. – 8:00 p.m.

Meet the stars of winter! Join our amateur astronomers as we learn about constellations. Make a star chart and then venture outside to view the night sky through a telescope. Afterwards, warm up with some hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly, as it gets cold in the evening. Fun for the whole family! Program will go on sprinkling rain or shine. Program will be canceled only if it is pouring rain. RESERVATIONS REQUIRED. Reserve by January 21st. Go to: <http://nightsky.eventbrite.com> Questions? Call Julie at 408-262-5513 ext.104.

Sunday, January 25

The Science of Seasons – Help Document Climate Change!

Visitor Center, Fremont

11:00 a.m. – 12:30 p.m.

Become part of the scientific community and help scientists gather data on how the climate is changing. A presentation will be given about the importance of gathering data, how plants can be an indicator of climate change, and how to take measurements of Don Edwards Refuge plants to be uploaded onto the Nature's Notebook website. Over time, the information you provide can be used by refuge managers to manage land more effectively. To register for this free workshop, go to <https://donedwardsphenology.eventbrite.com> or call 510-792-0222 ext. 362. Led by Carmen Minch.



Saturday, January 31

5 Tools You Can 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.

Jr. Refuge Manager Program

Visitor Center, Fremont

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

Become an honorary Jr. Refuge Manager by completing activities on the refuge. We will guide you in some of the activities that will help you earn the Refuge Manager Badge. The rest of the activities can be completed on your own. Those who complete the activities in the booklet for your age group will receive a Jr. Refuge Manager button. Register at <http://donedwardsjrmanger.eventbrite.com>. More information about the Jr. Refuge Manager program in Fremont can be found at <http://go.usa.gov/khTh>

February

Sunday, February 1

*Ohlone in the Marshes

Environmental Education Center, Alviso

1:00 p.m. – 2:30 p.m.

People have been living in the San Francisco Bay Area for 10,000 years. How did they survive without stores? Come learn about the Ohlone Native Americans and how they lived off of the land. Take a walk through the marsh, and go shopping in the Ohlone grocery store. Taste an Ohlone pickle and learn how to make rope. Best suited for ages 9 and up. Register at <http://eectulerope.eventbrite.com>.

Saturday, February 7

*Nature Walk for Health

Visitor Center, Fremont

10:30 a.m. – 11:30 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 1.3-mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center.



Geology Walk of the Don Edwards Refuge Visitor Center, Fremont

1:00 p.m. – 2:00 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 Jose Garcia at the refuge 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.

Jr. Refuge Ranger Program

Environmental Education Center, Alviso

1:00 p.m. – 2:30 p.m.

Become a Jr. Refuge Ranger! Our Jr. Refuge Ranger program is an introduction to the Don Edwards SF Bay National Wildlife Refuge from its wildlife to its plants. You'll taste pickleweed which you learn about endangered species. Jr. Refuge Rangers will participate in several fun hands-on activities in order to earn their badge at the end of the program. Dress in layers- we'll be going on a nature walk with volunteer Lynnea Shuck. Best suited for ages 8-11. RESERVATIONS REQUIRED. Go to <http://jrrangerwinter.eventbrite.com> Questions? Julie: 408-262-5513 ext.104.

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 (1.3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Go to <https://donedwardstwilight.eventbrite.com> or call 510-792-0222 ext 362. Led by Mary and Gene Bobik.

Sunday, February 8

*Duck Walk

Visitor Center, Fremont

9:00 a.m. – 10:30 a.m.

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

***Water is Wonderful**

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

Seventy-one percent of the Earth is covered in water, yet California is having a water shortage. The average American uses about 100 gallons of fresh water every day. Learn about simple things you can do to conserve water. Test the water quality of wetlands habitats. You'll be able to put your math and chemistry skills to use as you calculate your daily water usage, conduct simple monitoring tests, and learn how to protect and keep your local watershed clean. Register at <http://eecwateriswonderful.eventbrite.com>.

Friday, February 13

Litterati Art Exhibit Opening Reception

Environmental Education Center, Alviso
6:30 p.m. – 8:30 p.m.

Trash is everywhere. Soda cans, plastic bags, and cigarette butts litter the environment, choke wildlife, and threaten our planet. By combining technology, social awareness and art, the Litterati is tackling this ever-escalating problem one piece of litter at a time. Come find out how you can play your part. RESERVATIONS REQUIRED. Go to: <http://litteratieec.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

Saturday, February 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 707-769-4200 for additional information and directions.

Story Hunters

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

Discover what stories lie hidden on the Don Edwards Refuge in this program by Art Garibaldi. After a brief introduction on how to use our GPS units, we'll give you a set of coordinates that will lead you to the landmarks that embody the rich human history that helped shaped refuge lands. GPS units are available for loan. Register at <http://donedwardsstory.eventbrite.com>



Saturday, February 21

Community Service

Visitor Center, Fremont
9:30 a.m. – 12:00 p.m.

If you are interested in improving the refuge for visitors and for wildlife alike, join us at the Visitor Center for a community service project. We will do either a trash cleanup or a planting/weeding project. Dress appropriately for the task and for the weather. We will have gloves to lend and will provide the tools. Bring your own water bottle. Meet in the parking lot at the Visitor Center. Driving an additional 2.5 miles may be required since the project may be at a different location. For more information, or to make reservations, call 510-792-0222 ext. 361.

Habitat Under Construction in Bayfront Park

Bedwell Bayfront Park, Menlo Park
10:00 a.m. - 11:00 a.m.

The Salt Pond Restoration Project is entering Phase 2 of the management plan. Take a nature trail walk with Park Ranger Jose Garcia, and enjoy the abundant wildlife. Come see and be a part of the exciting transition. Cameras welcome. Location: Bayfront Expy and Marsh Rd in Menlo Park, CA 94025. An adult must accompany children. Call 510-792-0222 ext. 141 for more information.

Drawbridge Van Tour: A History Revealed

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

An abandoned 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 people scabbling out a living? How long did it exist? 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 will be of most interest to adults interested in history or nature; children 13 and over with an adult are welcome. Space is very limited. Van tour is subject to cancellation if conditions are too wet to drive on the levees. RESERVATIONS REQUIRED. Go to <http://drawbridgewinter.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

***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. Register at <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

Girl Scouts World Thinking Day

Environmental Education Center, Alviso
3:00 p.m. – 4:00 p.m.

Be part of the global community. Each year on February 22, girls honor their sister Girl Guides and Girl Scouts on World Thinking Day by taking time to give thanks for their international friendships and recognize that Girl Scouts of the USA is part of a global community. The theme for World Thinking Day 2015 is "We can create peace through partnerships." Come to the refuge for a guided discussion about different ideas of peace and learn about what you can do to promote peace at home. RESERVATIONS REQUIRED. Go to <http://gswtd.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104 (Note: badges are not provided).

Saturday, February 28

Team Citizen Scientists! – Community Service

Environmental Education Center, Alviso
1:00 p.m. – 2:30 p.m.

Become a citizen scientist! Are you interested in plants? Come help with native plant monitoring and habitat restoration. 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 Julie for reservations at 408-262-5513 ext.104.

Jr. Refuge Manager Program

Visitor Center, Fremont
1:00 p.m. - 3:00 p.m.

Become an honorary Jr. Refuge Manager by completing activities on the refuge. We will guide you in some of the activities that will help you earn the Refuge Manager Badge. The rest of the activities can be completed on your own. Those who complete the activities in the booklet for your age group will receive a Jr. Refuge Manager button. Register at <http://donedwardsjrmanager.eventbrite.com>. More information about the Jr. Refuge Manager program in Fremont can be found at <http://go.usa.gov/khTh>

5 Tools You Can Use to Find the Elusive Gray Fox

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

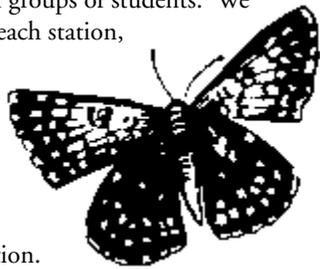
Do you sometimes see paw prints in mud or scat (poop) on the trails and assume that a dog left it? It could be from something else. Come along with me and I will show you how to distinguish and identify the markings of a gray fox. Gain some insights into the fox's nature and their behavior during the 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.

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.



Field Trips at Learning Center in Fremont

Wetland Round-Up Field Trips— Details about scheduling a SPRING 2015 field trip will be posted on our website on Monday, November 17, 2014. http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/Field_trip_Programs.html

Contact the Environmental Education Staff at Fremont:

Office: (510) 792-0222 x 475

Cell: (510) 377-7269

E-mail: tia_glagolev@fws.gov

Field Trips at the Environmental Education Center in Alviso

Wetland Round-Up Field Trips— Details about scheduling a SPRING 2015 field trip will be posted on our website on Monday, November 17, 2014. http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/Field_trip_Programs.html

Wetland Round-Up Field Trip Workshops

New Teachers that have not yet attended a field trip orientation must attend a training. The workshops are offered from 4 pm – 6:45 pm on weekdays in the spring.

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 pm – 6 pm on weekdays in the spring.

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

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.

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 Aja, Yee, the Living Wetlands Program Coordinator at 408-262-5513 ext. 102 or email LivingWetlands@sfbws.com.

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 presentations and guided tours are available, and generally last 1.5 hrs. in length.

Application for 2014-2015 Transportation Funds

The Yellow School Bus Field Trip Transportation Fund was started with funding from the U.S. Fish and Wildlife Service's Connecting People with Nature Program. The San Francisco Bay Wildlife Society has provided additional funding for the 2014-2015 school year. The program will be administered by the U.S. Fish and Wildlife Service and San Francisco Bay Wildlife Society Staff.

The fund was created to help Title 1 schools and schools with other financial hardships to access the Wetland Round-Up and Living Wetlands Field Trip Programs at the Don Edwards San Francisco Bay

National Wildlife Refuge Environmental Education Center in Alviso and the Newark Slough Learning Center in Fremont.

The **San Francisco Bay Wildlife Society** will pay up to \$700 for transportation for a field trip. If you are awarded funding for a bus you will be expected to hire the bus and mail a copy of the invoice to the San Francisco Bay Wildlife Society. Once they receive the invoice they will send the check for up to \$700 either to the bus vendor directly (school district or local vendor) or to the school/school district for the reimbursement, whichever method is preferred by the school.

PLEASE NOTE: If your school is in need of transportation to a field trip you will need to reserve a field trip date first and then fill out a Bus Fund Form. Please follow these steps and we will contact you as soon as possible with a response.

Please refer to our website for more information: http://www.fws.gov/refuge/don_edwards_san_francisco_bay/for_educators/yellow_bus_fund.html

You may also contact Genie Moore at 408-262-5513 ext 100 or at genie_moore@fws.gov.



Internships available: The Living Wetlands and Watershed Watchers programs are offering internships starting January 2015. To inquire, please email livingwetlands@sfbws.com or watershedwatchers@sfbws.com

TIDELINE

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

Volume 37, Number 4

Editor:Carmen Minch

To receive *Tideline*, email carmen_leong-minch@fws.gov, or write to: *Tideline*, San Francisco Bay National Wildlife Refuge Complex, 1 Marshlands Rd, Fremont, CA 94555

San Francisco Bay National Wildlife Refuge Complex

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

Project Leader: Anne Morkill
 Don Edwards Wildlife Specialist:..... Melisa Amato
 Don Edwards Warm Springs Unit Manager: .Ivette Loreda
 Farallon Refuge Manager: Gerry McChesney
 Farallon Wildlife Specialist:.....Jonathon Shore
 North Bay Refuges Manager:.....Don Brubaker
 North Bay Wildlife Specialist: Louis Terrazas
 South Bay Refuges Manager: Diane Kodama
 Public Affairs Officer:..... Doug Cordell
 Refuge Planner:.....Winnie Chan
 Chief of Visitor Services:Jennifer Heroux
 Park Ranger/Outdoor Recreation Planners:.....
 Joseph Garcia and Carmen Minch
 Environmental Education Specialists:
 Tia Glagolev and Genie Moore
 Volunteer Coordinator: Paul Mueller
 Law Enforcement Officers:..... Jared Klein, Jesse Navarro
 and Chris Wilson
 Biologists:Joy Albertson, Christopher Caris,
 Susan Euing, Allison Fuller, Meg Marriott,
 Cheryl Strong, and Rachel Tertes
 Administrative Staff:Lucinda Ballard, Ellen Tong
 Maintenance Staff: Juan Flores, James Griffin,
 Calvin Sahara, Michael Springman, and Ed Van Til

San Francisco Bay Wildlife Society

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

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 Program Administrator: Sue Ten Eyck
 Fund Development Consultant.....James Bernard

Tideline is On-Line

Visit our web sites at

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 San Francisco Bay NWR Complex

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 DON EDWARDS SAN FRANCISCO BAY
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 Fremont, CA 94555
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 PENALTY FOR PRIVATE USE, \$300

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SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE COMPLEX

WINTER 2014-2015
 Volume 37, Number 4

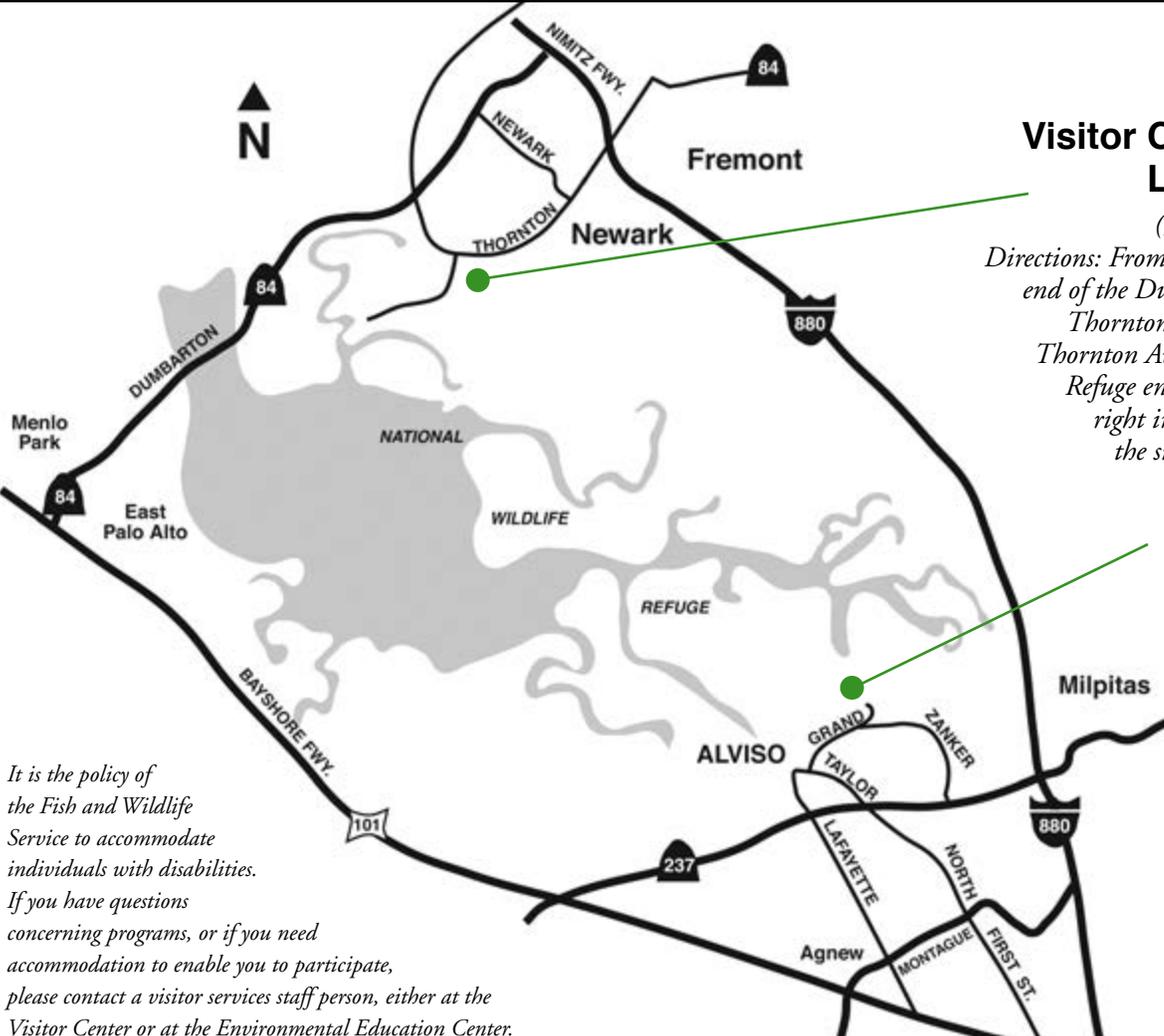


Tideline

Inside This Issue

- 1-3 **Clapper Rail**
- 4 **Your Neighborhood Refuge**
- 5 **7 Things**
- 6 **Teen Honored**
- 7 **Scout and Youth Programs**
- 9 **Cargill Donates Land**
- 10-13 **Winter Activities**
- 14-15 **Field Trips to the Refuge**

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



Visitor Center, Fremont Learning Center

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

Environmental Education Center, Alviso

(408) 262-5513
Directions: From I-880 or US-101, exit on CA-237 toward Mountain View/Alviso. Turn north onto Zanker Road. Continue on Zanker Road for 2.1 miles to the Environmental Education Center entrance road (a sharp turn at 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.