

Tideline

SUMMER 2017
Volume 40, Number 2

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

Sonoma Baylands Enhancement Demonstration Project – a Trendsetter for Wetland Restoration

By Don Brubaker

One February evening, Wildlife Refuge Biologist Meg Marriott stood quietly along the edge of the Sonoma Baylands Unit and listened. There had been reports over the last year that Ridgway's rails were present in the restored marsh. She heard nothing. Reaching for her audio player, she pressed "Play." A loud "kek kek kek" – the call of a Ridgway's rail – was emitted over the marsh. Several "kek kek keks" erupted back. Meg could barely contain her excitement. The Ridgway's rail has indeed returned. Those sounds have not been heard in these parts of San Pablo Bay in more than a century.

Long before the existence of Tesla, Honda, Chevrolet, or Ford, the horse and carriage were the dominant conveyance for people and supplies. Instead of gasoline, hay fueled this mode of transport, and a lot was needed. This demand led to the draining of the salt marshes that fringed San Pablo Bay by diking them off from the Bay tides, a common practice for more than 100 years. More than 93% of salt marsh habitat surrounding San Pablo and San Francisco Bays had been converted into farmland and other uses.

The movement to restore salt marsh habitats by citizens and conservationists began to take hold in the 1970s and 1980s. Species such as the salt marsh harvest mouse and Ridgway's rail needed salt marsh to survive, not to mention the important functions salt marshes serve ecologically. But unfortunately, salt marsh restoration on habitats that have been altered for more than 100 years is not a simple process. Once salt marsh becomes dry, the bay mud



Sonoma Baylands Unit in September 2010. Photo: Don Brubaker

oxidizes, losing structural integrity and causing subsidence.

Farm fields that were formerly salt marsh were now six to eight feet below where the mid marsh plain used to be. To raise the floor naturally, levees need to be breached to allow in the Bay tides. The tides would carry sediment which builds up on the former farm field. This carrying and deposition of sediment is the reason why shipping channels and harbors gets clogged, requiring the need to dredge on a regular basis. Simply knocking a hole in the levee and waiting for sediment to raise the floor six to eight feet will take a long, long time.

It can take anywhere from 30 to 60 years, maybe.

Wouldn't pouring water on the subsided soil reconstitute the land? Unfortunately, the dried lands don't work like a sponge. The oxidation/structural integrity of the soils is permanent.

An idea began to make way in the late 1980s which was to take dredge sediment from shipping channels and deposit this material on subsided farmland. Historically, dredge material was hauled out beyond the Golden Gate Bridge and deposited at

continued next page



Sonoma Baylands Unit in April 2017. Photo: Don Brubaker

sea. Why not use this material to build up the marsh plain close to that sweet spot where cordgrass can grow and proliferate? Certainly, this technique would create tidal marsh much faster than breaching the levee and letting tides bring in sediment naturally. Besides, Ridgway's rails can then move in much sooner.

In 1988, the California State Coastal Conservancy, Sonoma Land Trust, Port of Oakland, and the U.S. Army Corps of Engineers collaborated to develop the Sonoma Baylands Wetland Demonstration Project. This project would restore 322 acres of farmland to tidal marsh using dredge material. People raised concerns that the dredge material would contain contaminants, and historic farmland would be taken out of production. These concerns were addressed by reassuring that only dredge material tested as clean was to be used and by educating the public that tidal marshes are productive as well. Tidal marshes are nursery habitats for a billion-dollar fisheries industry that provides culinary delights and recreation in the San Francisco Bay Area and beyond.

The land was purchased from willing sellers and from 1993 to 1994 more than 2,800,000 cubic yards of material from the Petaluma River and Port of Oakland were

pumped into Sonoma Baylands. Later, channels were carved out, and peculiar herring-bone shaped structures were established. Those herring-bone structures were designed to help slow the incoming bay tide to allow sediment to drop out and accumulate. In 1995, a channel was opened to San Pablo Bay. The channel had to be widened in 2003 to allow greater tidal flow to increase sediment accumulation.

While waiting for the sediment to accumulate in the newly-created tidal area, pickleweed and saltgrass, two salt marsh plants that grow well in the higher elevations of a salt marsh, began to self-colonize along the edges. Grade schools were also getting involved with the program through the Students and Teachers Restoring a Watershed (STRAW) project. Wielding trowels, the students planted native plants to create upland habitat along the levee that was constructed to protect a railroad and serve as a hiking trail. Yet, Sonoma Baylands still looked like a mud flat with a network of channels. Discussions began about whether the restoration would ever be a success.

Then, in 2009, clumps of cordgrass began to appear. More and more clumps appeared and in late 2014, that sweet spot had been reached. Over the course of 18 to 24 months, cordgrass began to cover the

entire restoration with abandon!

Cordgrass is an integral habitat component for Ridgway's rails. The proliferation of the plant over Sonoma Baylands was a clear signal of a successful restoration. Except . . . where are the rails?

Two years later, Meg finally heard the rails that one February evening in 2017 and they were officially documented. In fact, Ridgway's rails responded from so many points over the Sonoma Baylands Unit that Meg could barely obtain a bearing on the birds and transcribe the observations fast enough!

That evening, 20 individuals were detected. All told, 23 Ridgway's rails have been detected over what was once thought to be an idea that may have limited success. Today, the concept of using beneficially re-used dredge material to accelerate a restoration to habitat useable to Ridgway's rails and salt marsh harvest mice has now become a standard practice.

Come visit the Sonoma Baylands Unit at San Pablo Bay National Wildlife Refuge and see the results of a 24-year restoration effort! Go to https://www.fws.gov/refuge/san_pablo_bay for trail maps.

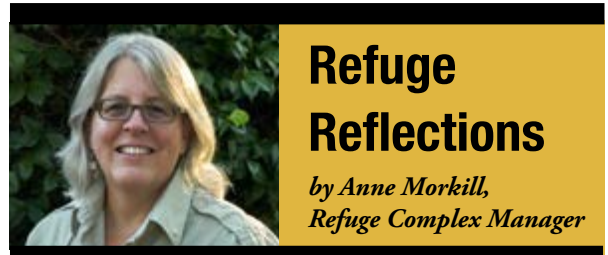
Don Brubaker is the Wildlife Refuge Manager for Antioch Dunes, Marin Islands, and San Pablo Bay National Wildlife Refuges.

Getting Hooked on Nature

A sprawling suburb surrounding a densely populated city hardly seems like a place where a future Wildlife Refuge Manager might come from. But I got hooked on nature at the end of a 6-foot fishing pole. I grew up fishing with my father in south Florida. Most Saturday mornings we'd head out to our favorite destination on the shallow grassy flats among the scattered mangrove islands of Biscayne Bay. It was there that I spent many hours with Dad observing wading birds and sea creatures, casting to the telltale clouds of mud and silver fins of foraging fish, far from the

bustling city streets. After I left home for college and a career, fishing became the common theme for all of our visits. This activity helped form a strong bond between us that lasted his entire life.

Fishing is one of America's favorite outdoor pastimes. The Outdoor Foundation's latest participation report shows fishing is the second most popular outdoor activity among adults over 25 years old (after jogging) and fourth most popular for youth. Fishing is one of six



priority public uses of the National Wildlife Refuge System and a key component of our visitor services program at several refuges in the San Francisco Bay National Wildlife Refuge Complex.

The Dumbarton fishing pier on the Don Edwards San Francisco Bay National Wildlife Refuge in Fremont is a favorite destination for many fishermen. Designated as a Public Fishing Pier, no fishing license is needed. Fish commonly caught here include rays, leopard sharks, white sturgeon, striped bass, and shiner surfperch. More people are discovering our new fishing access along Highway 37 at the Cullinan Unit of the San Pablo Bay National Wildlife Refuge. Surf fishing at the Salinas River National Wildlife Refuge is a very popular activity where you can catch striped bass.

Every summer we offer a free fishing clinic at the Dumbarton pier to introduce the public, young and old, to fishing. The refuge supplies bait and tackle and a loaner fishing rod for up to 50 participants. Each participant learns how to use a fishing rod, about the safety and ethics of fishing, and what they can do to protect the San Francisco Bay. Join us for this year's event on June 3 and form your own bonds with family and nature.



Photo: Gregg Aronson

Connections to Pier Fishing

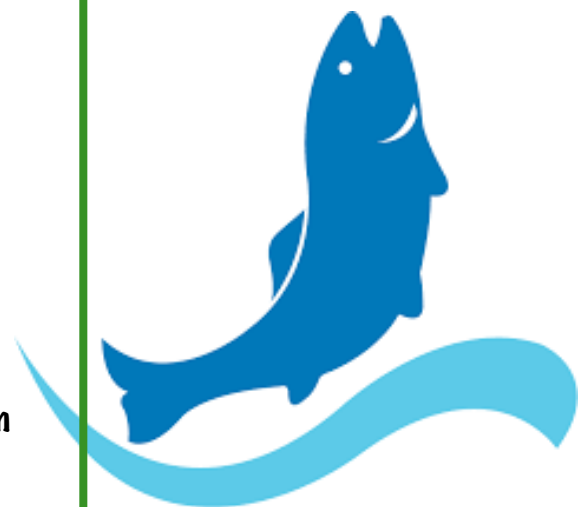
Learn how to fish for free at the Dumbarton Fishing Pier in Fremont!

**Saturday, June 3
9:00 a.m. -noon**

Space is limited to 50 people.
All equipment will be provided.

No fishing license needed. Please come on time.

To register, go to <http://doneedwardsfishing.eventbrite.com>
or call 510-792-0222 ext. 476.
For more information, see page 7



San Francisco Bay National Wildlife Refuge Welcomes new Don Edwards Refuge Manager, Jared Underwood

Dr. Jared Underwood arrived at the Refuge Complex in March 2017 to take the helm of Don Edwards San Francisco Bay National Wildlife Refuge. Learn more about Jared in this Q & A session with Visitor Services Intern Jacquelyn Warren.

Q: Where are you from?

A: I am originally from Los Angeles, but I moved to Hawaii when I was 12. I lived on O'ahu Island where I graduated from Kahuku High School.

Q: What field of study did you earn your Ph.D. in?

A: I earned my Ph.D. in conservation biology at Arizona State University. For my dissertation, I worked in conservation planning and reserve design, which is a process of identifying and prioritizing areas for habitat protection. I also earned my bachelor's and master's degrees in conservation biology at Brigham Young University in Utah. For my master's project, I studied the migration of hawks in western North America. This research consisted of capturing hawks and placing satellite transmitters on their backs to track their movement.

Q: What inspired you to choose this career field?

A: I would have to say that being exposed to nature at a young age by my parents led to my interest in the wildlife and the outdoors. My environment also played a large role. Growing up in Hawaii I learned a lot about threatened and endangered species. It was my interest in saving them that led me towards majoring in conservation biology for both my undergraduate and graduate studies.

Q: What was your previous job?



Photo: Jacquelyn Warren

A: I worked with the U.S. Fish & Wildlife Service where I managed the inventory and monitoring program for the Hawaiian and Pacific Islands. This job encompassed 22 refuges which spread from Japan down to Samoa. I also managed a complex of five refuges on three different islands for a year while I was there. It was that year of work that sparked my interest in becoming a manager. I also developed an interest in public education as several of these refuges were semi-urban.

Q: Why Don Edwards San Francisco Bay National Wildlife Refuge?

A: One of the reasons I was excited to come work here at Don Edwards was because it still has that endangered species focus. It also has great restoration projects specifically for the endangered species that we have here on the refuge. The large restoration project of the south bay was also of interest to me. As part of my last job, I worked on the landscape level which I really preferred over working on smaller projects. I personally believe these larger restoration projects are more impactful. I also really like the environmental education program that Don Edwards has. Public engagement is very important to me since my wildlife experiences I had as a child led me to where I am today.

Q: What were your first impressions of the Bay Area?

A: The beautiful green hills and how friendly everyone is at the refuge. Also, the cultural diversity we have here, which reminds me of home. I was also struck by the natural beauty of the area despite the urban setting. And, of course, the passion that a lot of locals seem to have for the environment.

Q: What experiences are you hoping to gain/accomplish that you couldn't at your other job?

A: Well, by working at Don Edwards, I will have the ability to work in an urban refuge environment giving me more opportunity to interact with the public. I will also have the chance to work on our large scale restoration projects and with the Warm Springs Unit.

Jared enjoys hiking, birding, and all water related activities such as surfing, snorkeling, scuba diving and kayaking. He is married with four children ages 18 months to 11 years old.

Volunteer Opportunities: Summer 2017

Don Edwards San Francisco Bay National Wildlife Refuge

If you have an interest in wildlife and their conservation, enjoy working with people, and are enthusiastic and dependable, the refuge's Volunteer Program is for you! As a volunteer, you'll receive on-the-job training from staff and other volunteers in the project area you choose. Project areas are: restoration projects, information desk on weekends, interpretive programs, school field trips, and citizen science/community service.

Upcoming Volunteer Orientations for Summer

Volunteer orientations will meet in the auditorium of the Environmental Education Center in Alviso, 11 a.m. to noon.

Saturday, June 10

Tuesday, June 13

Saturday, July 8

Tuesday, July 11

Tuesday, August 9

Volunteer orientations in Fremont will meet in the Visitor Center

Saturday, June 10 2:00 p.m. - 3:00 p.m.

Volunteer Requirements: attend a volunteer orientation; attend the scheduled trainings; meet the age requirements for the program. Volunteer applications provided at orientation.

Don Edwards San Francisco Bay National Wildlife Refuge & REI Outdoor School presents

The Amazing Refuge Race

2 Marshlands Rd, Fremont

August 19, 2017 • 10:30 a.m. – 12:00 p.m.

Armed with GPS units, you and your team will “race” against other teams by attempting to complete required tasks on the refuge first. Teams will be given a set of coordinates where they must try to locate using a GPS unit. Once at that location, teams must work together to complete a task. When that task is completed, teams will receive the next set of coordinates. Those who complete all tasks in the fastest time wins!

Intrigued? Go to http://www.fws.gov/don_edwards_san_francisco_bay or call Carmen at 510-792-0222 ext. 476 for additional information and rules. Don't have a GPS unit? Borrow one of ours.

Registration is required! You may register up to 5 people for your team. A minimum of 2 people per team. The refuge may place individuals on teams containing fewer than 5 people to ensure maximum participation. Registration deadline is August 17. Go to <http://amazingrefugerace.eventbrite.com> or call 510-792-0222 ext. 476. There is no cost to enter.

GPS Bootcamp by REI Outdoor School

Learn how to enter coordinates and locate coordinates using a hand-held Global Positioning unit prior to the Amazing Refuge Race. We will have limited number of units to practice on. No reservations necessary.

When: August 19, 2017

Where: Visitor Center, 2 Marshlands Rd, Fremont, CA

Time: 10:00 a.m. - 10:15 a.m.

Cost: FREE! No reservations necessary.

Help Us Protect Your San Francisco Bay Wetlands!

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.

For a gift membership, call 510-792-0222 ext. 364.

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. My dues include a subscription to *Tideline*. Enclosed is my contribution of:

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

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

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Email _____

Thank you for your support!

For nearly 30 years, the San Francisco Bay Wildlife Society has:

- Introduced the refuge to tens of thousands of students of all ages
- Helped fund the Bair Island restoration and Management Plan, restoration work at Antioch Dunes NWR, and uplands restoration at the Environmental Education Center
- Provided weekend staff in Alviso through long-term partnerships with the City of San Jose and the Santa Clara Valley Urban Runoff Pollution Prevention Program
- Provided funding for a new boardwalk at the New Chicago Marsh Trail at the Environmental Education Center
- Funded a new greenhouse
- Provided funds to create a native plant nursery
- And much more

Help continue this tradition by becoming a Supporting Member of the Society.

Benefits include:

- Free subscription to *Tideline* newsletter
- Tax Deduction to the extent permitted by law
- Free book – *Exploring Our Baylands*
- The joy of helping protect this important environment

Thank you San Francisco Bay Wildlife Society Donors!

We gratefully acknowledge the following donors who have made gifts to the San Francisco Bay Wildlife Society between January 1, 2017 and March 31, 2017. These gifts will be used for publishing *Tideline*, environmental education, habitat restoration, and interpretive programs at the San Francisco Bay National Wildlife Refuge Complex.

Matching Fund Donations

Bright Funds Foundation
JustGive (Cisco Foundation)

Sponsor

Valerie Boquet, Mark A & Kathleen Soulard

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John F Atwood, Mary & Gene Bobik, Kim Brink, Terry & Zoe Coddington, Cheryl Davis, Jane Hicks, Norman & Marca Houseworth, Mark Jackson, Piedmont Garden Club, Robert & Harriet Jakovina, Howard Shellhammer, Varon Smith, Tri-City Ecology Center

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San Francisco Bay Wildlife Society Quarterly Message

30th Anniversary of the San Francisco Bay Wildlife Society

To celebrate our 30th Anniversary as a not-for-profit Friends Group supporting the San Francisco Bay National Wildlife Refuge Complex, the Society is launching an anniversary fund raising campaign with several objectives:

1. Support new and ongoing native habitat restoration projects
2. Obtain long-term funding for Society employees at Fremont to keep Visitor Contact Station open on weekends
3. Support refuge facility improvements (i.e., support planning for a new Visitor Center and smaller more shovel-ready projects such as accessible boardwalks, fishing platforms, trail improvements, multi-lingual interpretive signs, restroom facilities, and nature play area)
4. Develop new and enhanced environmental education and stewardship efforts
5. Expand the Society Nature Stores.

We are seeking corporate and individual donations to fund these projects, and people who might be interested in helping with the campaign. Please share with us any company contacts to explore future funding opportunities. In the next *Tideline* issue, we will have a special insert to commemorate this special year and share our plans for the years ahead.

Need key skills on Board of Directors and Committees:

We are accepting new Board of Director members. Those with legal backgrounds and business financial experience are particularly needed. We are also accepting volunteers to join the Membership and Volunteer Recruitment Committee, the finance team, fund development team, and the Marketing and Communications committee. We will be launching a social media campaign to share the Society's mission and vision. Join us in determining the best strategy to get the word out. Contact us to chat about these opportunities and contribute your expertise in support of our National Wildlife Refuges in the Bay Area. A joint U.S. Fish & Wildlife Service and Friends conference in Region 8 is coming up in late June. Interested in attending or learning more? Contact Ceal, see below.

Out on the trail: I joined refuge staff and Society staff to welcome and thank a large number of refuge volunteers at the annual volunteer appreciation luncheon. The San Francisco Bay National Wildlife Refuge Complex Volunteer of the Year was Ken Roux, a retired member of law enforcement who supports the Environment Education Center Marsh-In summer camp every year by providing security during the overnight sleepover. Ken also trains interns, conducts interpretive programs, and volunteers at several special events. Volunteers who

contributed many hours and in unique situations were recognized as well: Larry Rosenblum was named Rookie Volunteer of the Year, and the Environmental Education Restoration Crew was named Team Volunteers of the Year. Mary Deschene, the Society's Program Administrator, recognized Adam Champoux for his work in the Fremont Nature Store. I am always inspired and encouraged by the many volunteers, young and old, singles and families, who give their most precious gift to us: their time and labor. Thank you all!

Nature Store Volunteer

Opportunities: Volunteers are vital to the Nature Stores at Fremont and Alviso. Contact Mary.Deschene@SFBWW.com 510-792-0222 ext.364 for more information!

Your feedback desired! We welcome feedback on the changed hours at the Visitor Contact Stations (Fremont) and Environment Education Center (Alviso/San Jose), Nature Stores, and San Francisco Bay Wildlife Society goals and mission. (www.surveymonkey.com/sfbws_survey)

Check out www.sfbws.com and refugeassociation.org As always, we welcome your inputs. Send your thoughts to [Ceal\[dot\]Craig\[at\]SFBWS\[dot\]com](mailto:Ceal[Craig]@SFBWS[dot]com)

Cecilia (Ceal) D. Craig, PhD
President, SFBWS Board of Directors

Summer 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.

JUNE

Friday, June 2

Night Sky Party

Environmental Education Center, Alviso
8:30 p.m. - 10:00 p.m.

Meet the stars of summer! 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! RESERVATIONS REQUIRED. Go to <https://summersky.eventbrite.com>. Questions? Call Hope at 408-262-5513 ext.104.

Saturday, June 3

Connections to Pier Fishing

Dumbarton Fishing Pier, Fremont
9:00 a.m. - 12:00 p.m.

Have you ever wanted to try fishing but didn't know how to begin? Learn the fundamental basics of catch-and-release fishing at the Dumbarton fishing pier! Discover the types of wildlife living in the San Francisco Bay, learn the safety and ethics of fishing, and then try your luck out on the pier with our fishing poles. All participants receive free box with tackle. No fishing license needed. Space is limited to the first 50 people. Event is recommended for ages 5 and up. You must arrive at 9 a.m. to participate. REGISTRATION REQUIRED. Register at <http://donedwardsfishing.eventbrite.com> or call 510-792-0222 ext. 476.

Tai Chi at the Refuge

Environmental Education Center, Alviso
9:30 a.m. - 10:30 a.m.



HEALTHY PARKS
HEALTHY PEOPLE
BAY AREA

Morning Crane founder Chris Shelton is a certified Tai Chi and Qigong practitioner and instructor with 20 years of experience. Chris Shelton has helped thousands of people around the world reclaim their health and enjoy lives free from chronic pain. Sponsored by Morning Crane and Open Space Authority. No registration necessary.

Nature Walk for Health

Visitor Center, Fremont
10:30 a.m. - 11:30 a.m.



HEALTHY PARKS
HEALTHY PEOPLE
BAY AREA

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 Fran-

cisco Bay. Meet in front of the Visitor Center. Led by Matt Keehner.

National Trails Day: Hike the Mallard Slough Trail

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

What better way to celebrate National Trails Day than to go for a hike on the Mallard Slough Trail. Look for birds, mammals, and animal tracks as we explore along the water's edge on this 3.7-mile nature walk. Bring binoculars and your favorite field guide to help enjoy the views. Have at least one liter of water, snacks, and appropriate clothing. Free drawing for National Trails Day swag for participants at the end of the hike. Rain cancels. Led by Steve Stolper. RESERVATIONS REQUIRED. Go to: <https://hikeeetrail.eventbrite.com>. Questions? Call 408-262-5513 ext.104.

*Wetlands Walking Tour

Environmental Education Center, Alviso
10:30 a.m. - 12:00 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 us. Find out why so many creatures call Don Edwards SF Bay National Wildlife Refuge home by solving puzzles, playing games and even making your own bird nest! Register at: <https://eecomarshhomes.eventbrite.com>

Tiny Drifters

Environmental Education Center, Alviso
1:00 p.m. - 2:00 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! Best suited for ages 7 and up. Register at <http://eectinydrift.eventbrite.com> or call 408-262-5513 ext. 102 for reservations.

Saturday, June 10

Stewardship Saturday

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 stewardship 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.

*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 ages are welcome. For reservations, go to <https://tidesmatter.eventbrite.com>. Questions? Call Hope at 408-262-5513 ext. 104.

A Day in the Life of a Swallow

Visitor Center, Fremont
1:00 p.m. - 2:30 p.m.

Join docent Roy Sasai to experience the "day to day" life of a swallow. What are they doing when they are not eating? What is their favorite food? Where do they get it? How do they get it? You will have an opportunity to catch their meal too. Meet outside the Visitor Center to learn about this species' natural history and their habits. We will hike to spots on the refuge to view

them feeding and discuss if sea level rise will affect their food source. Bring binoculars and a camera. The hike is approximately 1 mile with medium hills. Register at <https://lifeofswallow.eventbrite.com>.

Outfall Tour

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

Have you ever wondered where your indoor water ends up? If you live in the south bay, it probably goes to the San Jose-Santa Clara Regional Wastewater Facility to be cleaned. Join us on a tour of the facility's outfall and see firsthand how it helps keep the San Francisco Bay and our refuge clean. Register at <https://eecoutfall.eventbrite.com>.

Volunteer Orientation

Visitor Center, Fremont
2:00 p.m. - 3:00 p.m.

Increase your quality of life with a resolution to volunteer for a good cause. Come to this presentation to see if volunteering at the Don Edwards San Francisco Bay National Wildlife Refuge is right for you. Begin by learning the mission and goals of the San Francisco Bay National Wildlife Refuge Complex, its parent agency U.S. Fish and Wildlife Service, and volunteer positions currently open at the Fremont location. Presented by Paul Mueller.

Twilight Marsh Walk

Visitor Center, Fremont
7:30 p.m. - 9:15 p.m.

Cap off the day by experiencing 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. Go to <https://donedwardstwilight.eventbrite.com> or call 510-792-0222 ext. 362. Led by Mary and Gene Bobik.

Saturday, June 17

Nature Yoga

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

Enjoy the benefits of Yoga outdoors with great views of the salt marsh. Through story and postures, learn what attracted people and wildlife to the Bay. There will be a short hike to the site on top of the hill from the Visitor Center. Bring a yoga mat. A limited number of mats are available to borrow. Wear comfortable clothing. Consult with your doctor before participating. All ages and abilities welcome. Reservations are required. Register at <http://donedwardsyoga.eventbrite.com> or call 510-792-0222 ext. 362. Led by Carmen Minch.

Hike the Mallard Slough

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

Look for birds, mammals, and animal tracks as we explore along the water's edge on this 3.7-mile nature walk. Bring binoculars and your favorite field guide to help enjoy the views. Have at least one liter of water, snacks, and appropriate clothing. Hike cancels if rain. Led by Steve Stolper. RESERVATIONS REQUIRED. Go to <https://hikeeetrail.eventbrite.com>. Questions? Call 408-262-5513 ext.104.

Summer 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.

Insect Exploration

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

Insects have been on this Earth for hundreds of millions of years. Come learn about the many different insects that call the San Francisco Bay Area their home. We will examine insects and learn how they've adapted to survive. Join us as we dig in the dirt and crawl through the plants in search for our six-legged friends. Be prepared to get dirty. All ages are welcome. Register at <http://eecinsect.eventbrite.com> or call 408-262-5513 ext. 102.

*A Taste of the Refuge

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

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

Drawbridge Van Excursion

Environmental Education Center, Alviso
2:00 p.m. - 4:30 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 will 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. RESERVATIONS REQUIRED. Go to <http://drawsummer.eventbrite.com>. Questions? Call Hope at 408-262-5513 ext.104. (Note: we do not visit the town itself - we go to the closest spot that one can legally view Drawbridge.)

Saturday, June 24

Webelos Adventure Into the Wild

Visitor Center, Fremont
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. Space is available for up to 15 Webelos. Registration required. Register at <https://donedwardswebelos.eventbrite.com>. Program led by June Smith.

Bay Bike Ride

Meet at the Visitor Center, Fremont
10:30 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 including salt marsh, salt pond, and the bay. 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 <https://donedwardsbike.eventbrite.com> or call 510-792-0222 ext. 363 for reservations.

*Family Bird Walk

Visitor Center, Fremont
2:30 p.m. - 4:30 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. 363.

JULY

Saturday, July 1



*Nature Walk for Health

Visitor Center, Fremont
10:30 a.m. - 11:30 a.m.

See June 3 for program description.

Saturday, July 8

*Bird Watching for Beginners

Visitor Center, Fremont
8:30 a.m. - 10:00 a.m.

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. Led by Carmen Minch.

Drawbridge Van Excursion

Environmental Education Center, Alviso
9:30 a.m. - 12:00 p.m.

See June 17 for program description and registration information.

Stewardship Saturday

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

See June 10 for program description and registration information.

Bay Bike Ride

Meet at the Visitor Center, Fremont
10:30 a.m.

See June 24 for program description and registration information.

Saturday, July 15

*Marshlands of Dreams

Visitor Center, Fremont
10:00 a.m. - 11:00 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.

Ohlone in the Marsh

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

Do you want to know more about the Native Americans that lived in the Bay Area before us? Come to the refuge to learn about some of the tools and games the Ohlone might have used and played. Play Ohlone games and take home your own. Best suited for ages 8 and up. Register at <http://eecohlone.eventbrite.com> or call 408-262-5513 ext. 102 for reservations.

Why Just One?

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

Join Sea Shepherd in our first in-house feature length documentary on the sandy shores of Costa Rica. In the documentary, *Why Just One?*, the Sea Shepherd crew tackles a vexing paradox: trying to prevent the poaching of sea turtle eggs in Costa Rica when the activity is legal in one beach town, Ostional, on the country's Pacific coast. This legal loophole fuels and enables egg poaching throughout Costa Rica. In *Why Just One?*, Sea Shepherd explores the widely accepted statistic that just one in one thousand sea turtle hatchlings survive to maturity. This is a one hour film appropriate for ages 10+, or at your own discretion. A brief Q&A will follow the showing. RESERVATIONS REQUIRED. Go to <https://eecdocumentary.eventbrite.com> Questions? Call Hope at 408-262-5513 ext. 104.

Twilight Marsh Walk

Visitor Center, Fremont
7:30 p.m. - 9:15 p.m.

See June 10 for program description and registration information.

Saturday, July 22



Nature Yoga

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

See June 17 for program description and registration information.

Meet the Swallow Family

Visitor Center, Fremont
1:00 p.m. - 2:30 p.m.

Some of the baby swallows are now out exploring their new world. Join docent Roy Sasai to view the crèches (assembly of colony young) as they await their meal delivery. Meet outside the Visitor Center to learn about their adventures as they explore their new world, and how they learn to fly and catch their meals to prepare for their monumental 5000-mile journey. We will hike to spots on the refuge to view their unusual gathering spots and discuss the effects of sea level rise on their future. Bring binoculars and a camera. The hike is approximately 2 miles total with medium hills. Register at <https://swallowfamily.eventbrite.com>.

Saturday, July 29

Indicators that Fox are in Your Area

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. Led by Bill Leikam, the Fox Guy. Register at <http://donedwardsfox.eventbrite.com>.

AUGUST

Saturday, August 5



*Nature Walk for Health

Visitor Center, Fremont

10:30 a.m. – 11:30 a.m.

See June 3 for program description.

Bay Bike Ride

Meet at the Visitor Center, Fremont

10:30 a.m.

See June 24 for program description and registration information.

Twilight Marsh Walk

Visitor Center, Fremont

7:00 p.m. – 8:45 p.m.

See June 10 for program description and registration information.

Saturday, August 12

Drawbridge Van Excursion

Environmental Education Center, Alviso

9:30 a.m. - 12:00 p.m.

See June 17 for program description and registration information.

Crafts in the Outdoors: Beginning

Leatherwork

Environmental Education Center, Alviso

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

Doing crafts outdoors is a wonderful experience! Make

and decorate (tool) a small patch for your backpack or clothing made from vegetable tanned leather. Learn how Bay Area residents used the tanoak tree for food and for making leather. This family-friendly program lets you have fun crafting your own leather item. Bring water, snacks, and appropriate clothing. This program runs rain or shine. Led by Steve Stolper. RESERVATIONS REQUIRED. Go to <https://eeclleatherwork.eventbrite.com>. Questions? Call 408-262-5513 ext.104.

*Marshlands of Dreams

Visitor Center, Fremont

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

See July 15 for program description.

Intro to Geo PDF Maps

Visitor Center, Fremont

10:30 a.m. - 12:00 p.m.

What's a Geo PDF map? How do you use it? A Geo PDF map is a map that you download and store on your smart phone. Use the free app called PDFMaps to view and navigate from the stored map in your phone. Use it on hikes or bike rides to log your distance, start time, and duration, as well as perform other functions. You don't need wi-fi or a data connection once the app is installed. It uses your phone's GPS feature so it works even if you are out of range of mobile phone service. Meet at the Visitor Center to see a slideshow and find out how to obtain a copy of a Geo PDF map of the Don Edwards SF Bay National Wildlife Refuge. A live demonstration will follow. Led by docent Gregg Aronson. Register at <https://geopdf.eventbrite.com>.

Why Tides Matter

Environmental Education Center, Alviso

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

See June 10 for program description and registration information.

Saturday, August 19

GPS Unit Bootcamp by REI Outdoor School

Visitor Center, Fremont

10:00 a.m. - 10:15 a.m.

This GPS unit bootcamp led by REI Outdoor School is intended to teach how you use the basic functions of a Global Positioning Unit. Waypoint entry and coordinate location is taught and practiced. Intended as a precursor for the Amazing Refuge Race. No reservations necessary. GPS units will be available for loan.

Amazing Refuge Race

Visitor Center, Fremont

10:30 a.m. - about 12:00 p.m.

Sign up to participate in the Amazing Refuge Race! Using a GPS unit, teams of five will "race" to the coordinates given and perform specific tasks. Once the tasks are completed, teams will be given another set of coordinates. Team with the best finish time wins! Prizes will be awarded. Teams may use their own GPS unit, or borrow one of ours. Form your own teams or one can be assigned to you. Reservations are required! Go to <http://amazingrefugerace.eventbrite.com> or call 510-792-0222 ext. 476.

Saturday, August 26

Stewardship Saturday

Visitor Center, Fremont

9:30 a.m. - 12:00 p.m.

See June 10 for program description and registration information.

*Family Bird Walk

Visitor Center, Fremont

10:00 a.m. – 12:00 p.m.

See June 24 for program description and registration information.

Wetlands Walking Tour

Environmental Education Center, Alviso

10:30 a.m. - 12:00 p.m.

See June 3 for program description and registration information.

Indicators that Fox are in Your Area

Visitor Center, Fremont

2:00 p.m. – 3:30 p.m.

See July 29 for program description and registration information.

TIDELINE

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Editor: Carmen Minch

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

Tideline is On-Line Visit our web sites at

- http://www.fws.gov/refuge/antioch_dunes
- http://www.fws.gov/refuge/don_edwards_san_francisco_bay
- http://www.fws.gov/refuge/ellicott_slough
- http://www.fws.gov/refuge/farallon_islands
- http://www.fws.gov/refuge/marin_islands
- http://www.fws.gov/refuge/salinas_river
- http://www.fws.gov/refuge/san_pablo_bay



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San Francisco Bay NWR Complex



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. We are piloting new and modified activities that support Next Generation Science 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.**

Field Trips at Learning Center in Fremont

Wetland Round-Up Field Trip

Wetland Round-Up field trip registration information for the 2017/2018 school year will be announced on the refuge’s website in August 2017.

Contact the Environmental Education Staff at Fremont:

Office: (510) 792-0222 ext. 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

Wetland Round-Up field trip- registration information for the 2017/2018 school year will be announced on the refuge’s website in August 2017.

Contact the Environmental Education Staff at Alviso:

Office: (408) 262-5513 ext 100

Cell: (510) 377-5250

E-mail: genie_moore@fws.gov

Wetland Round-Up Field Trip Workshops

The workshop dates will be announced online with the field trip registration information (see above).

Living Wetlands Program

Living Wetlands provides a 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 & Wildlife Service, and the San Francisco Bay Wildlife Society.

Program Offerings: (See below for information about priority schools)

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. There is a limit of 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.

Due to funding restrictions, first priority will be given to Title 1 schools in San Jose. Second priority will be given to schools in Milpitas, Santa Clara, Saratoga, Monte Sereno, Los Gatos, Campbell, and Cupertino.

For more information, or to make a reservation, contact the Living Wetlands Program Coordinator at 408-262-5513 ext. 102 or at Colter.Cook@sfbws.com.

Programs for Colleges and Universities

Guided Field Trips are offered at the Environmental Education Center in Alviso. Programs generally last from 1.5-2 hours. *Reservations must be made at least 8 weeks in advance of the desired field trip date.* Please contact the Watershed Watchers Program Coordinator at 408-262-5513 ext. 104 or at Hope.Presley@sfbws.com to make a reservation.

College instructor-led tours are allowed at the Environmental Education Center in Alviso. All college instructors planning this type of field trip must make a reservation at least 8 weeks in advance of the desired field trip date. If your group size is over 25 you will need to acquire a Special Use Permit from our Headquarters office in Fremont. Please contact Genie Moore, at 408-262-5513 ext. 100 or at Genie_moore@fws.gov or the Watershed Watchers Program Coordinator, at 408-262-5513 ext. 104 or at Hope.Presley@sfbws.com to make a reservation.

Application for 2017/2018 Blue Goose Bus Funds

The Blue Goose School Bus Fund provided by the U.S. Fish & Wildlife Service and San Francisco Bay Wildlife Society was created to help Title 1 schools and schools with proven hardships to come the Wetland Round-Up and Living Wetlands Field Trip Programs in Alviso and the Newark Slough Learning Center in Fremont.

Please refer to our website for more information: <https://go.usa.gov/xX6KZ>

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



DON EDWARDS SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE
ENVIRONMENTAL EDUCATION CENTER

Summer

FREE Marsh-In Summer Day Camp

2017



Live Animals,
Outdoor Activities,
Hikes, Crafts
and Fun!

July 31 - August 4

Monday- Bird Day!
Tuesday- Fish Day!
Wednesday- Mammal Day!

Overnight
Night hikes, star gazing, sleeping
under the stars, and ice cream
making!

Grades 1-6 : Mon - Wed
9:15 am - 1:30 pm

Overnight (Grades 4 - 6)
Thursday 6:00 pm-
Friday 9:00 am

Location:

1751 Grand Blvd, Alviso, CA 95002

Requirements:

Campers must be entering grades 1-6 in Fall 2017, provide their own transportation to and from camp, and attend ALL days of camp.

To Apply:

Download the application, you can fill it out on the computer and email it to us or mail it. (See application form.)

Selections will be made by lottery--Applicants will be notified of their status by mail or email after June 27th.

Applications due by June 26th.

Questions?: (408) 262-5513 x100
Genie_Moore@fws.gov Preguntas?
(510) 792-0222 x125
Jared_Underwood@fws.gov

Visit us at
http://www.fws.gov/refuge/don_edwards_san_francisco_bay/



UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
DON EDWARDS SAN FRANCISCO BAY
NATIONAL WILDLIFE REFUGE
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Fremont, CA 94555

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SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE COMPLEX

SUMMER 2017
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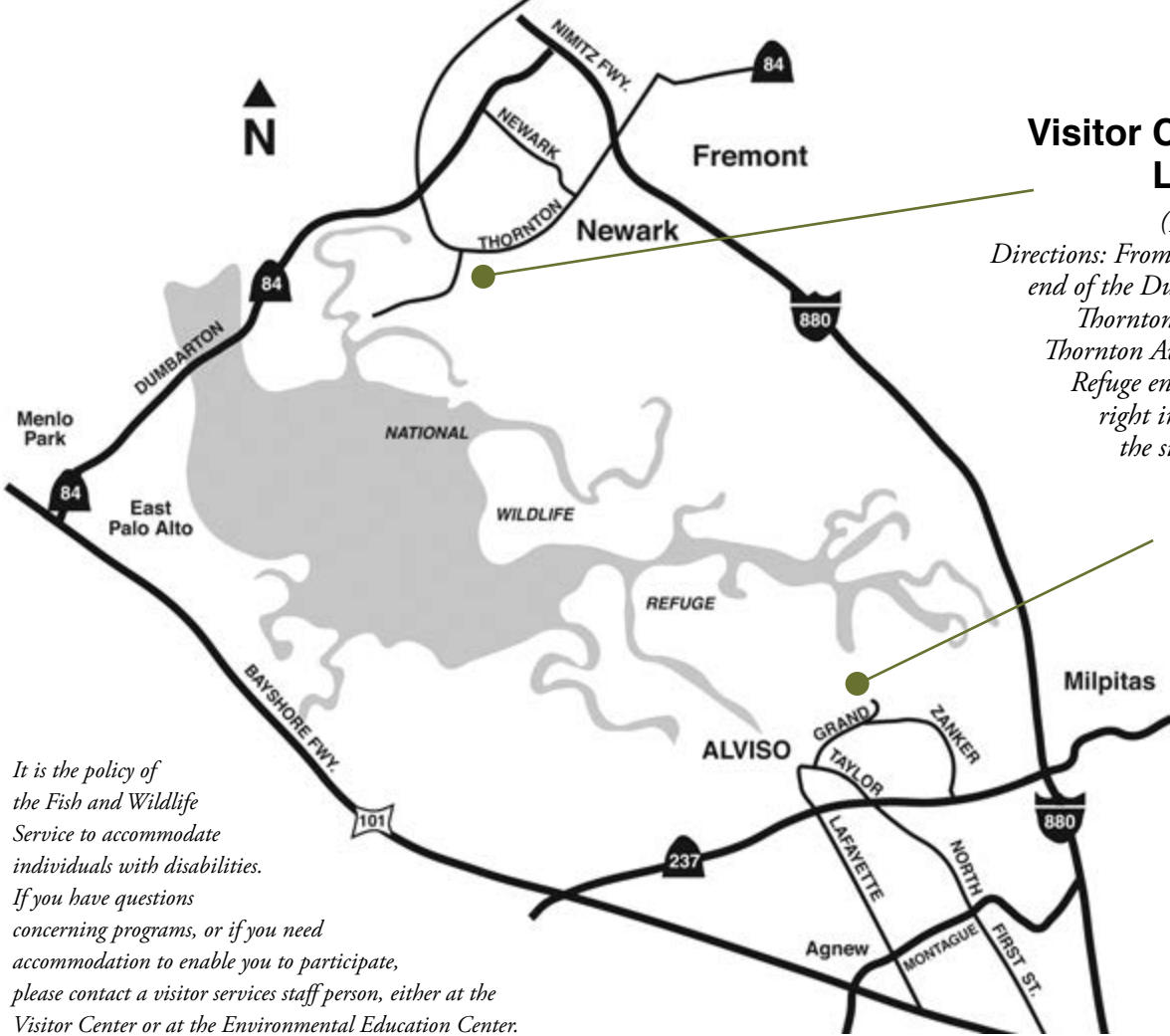


Tideline

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



Visitor Center, Fremont Learning Center

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

Environmental Education Center, Alviso

(408) 262-5513
Directions: From I-880 or 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.