

Tideline

WINTER 17-18

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

Improving Burrowing Owl Habitat in South San Francisco Bay

By *Aidona Kakouros*

Once abundant in South San Francisco Bay, the burrowing owl currently breeds at only five known sites. In 2017, only 64 adults were reported during the breeding season in the entire South Bay.

I take a deep breath, trying to digest and synthesize the information just reported at the South Bay Burrowing Owl Surveying Network meeting. It is evident the burrowing owl population in the South Bay is in peril. Is it too late? Can our efforts save it? What else can be done?

Habitat loss due to development is the main factor of this dramatic decrease. Grasslands habitats were once common in the South Bay. Considering the current booming Bay Area housing market and habitat degradation from factors associated with large scale urbanization, very little burrowing owl habitat remains. Unless habitat management and other conservation activities take place, it is possible that the breeding population of burrowing owls will be extirpated from the South Bay.

This realization prompted public agencies, nonprofit conservation organizations, and burrowing owl experts to join forces and try to reverse the downward population trend in the South Bay. A collaboration between the Don Edwards San Francisco Bay National Wildlife Refuge, Santa Clara Valley Habitat Agency, and San Francisco Bay Bird Observatory was formed to enhance burrowing owl habitat at the refuge's Warm Springs Unit.

The Warm Springs Unit, located in South Fremont, is composed of 719 acres of vernal pool grasslands. It is managed by the



Photo taken from a camera trap. Photo: San Francisco Bay Bird Observatory

refuge to provide habitat for several endangered and special status species, including burrowing owls.

Warm Springs is home to the federally-endangered vernal pool tadpole shrimp (*Lepidurus packardii*) and Contra Costa goldfield (*Lasthenia conjugens*), and the federally-threatened California tiger salamander (*Ambystoma californiense*). The site is grazed by cattle to keep vegetation low and to improve the habitat conditions for the species listed above and for the burrowing owl.

Historically, burrowing owls have used the Warm Springs unit and the surrounding areas as breeding and wintering habitat. Currently, the Unit is home to one of the five breeding burrowing owl populations in the South Bay.

Because of its relatively large acreage,

history, and management regime, Warm Springs Unit has great potential for burrowing owl habitat enhancement. The goal is to stabilize and increase the burrowing owl breeding population on site and use the acquired knowledge from this process to enhance other habitats in the South Bay.

So what are the main elements for a high quality burrowing owl breeding habitat? While burrowing owls may nest in a variety of habitats there are three main requirements.

Open Landscape

The ideal habitat for burrowing owls is associated with open landscape with no trees and well drained areas. Other than that, the species exhibits a remarkable tolerance for human alteration of natural habitats.

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Presence of Underground Burrows

As the name suggests, burrowing owls use burrows for nesting and for shelter from predators and weather. Conversely, unlike what the name suggests, the owls do not dig their own burrows. They rely on their neighbors like California ground squirrels and other ground-digging (fossorial) mammals to create the burrows.

Many people may not realize how important ground squirrels are for grasslands ecosystems and particularly for burrowing owls. Not only do ground squirrels excavate extensive networks of burrows but they clean and maintain the old ones. Room service anyone? Ground squirrels also alert owls for the presence of predators through their alarm calls. In fact, at Warm Springs, California ground squirrel is considered a keystone species because it provides essential habitat to many species including the California tiger salamander.

For these reasons we try to maintain and increase the squirrel population. Short vegetation with some bare ground openings encourages ground squirrel burrowing activity. Overgrown vegetation or a thick layer of thatch hinders ground squirrel activity. This leads us into the third habitat requirement.



Photo: Tom Bennett

Short, Low Density Vegetation for Nesting Habitat

Short vegetation is also critical for burrowing owls. It allows quick detection of predators and an unobstructed entrance into the burrows. Burrowing owls may abandon their nests when vegetation grows too thick or high.

While ground disturbance and squirrel burrowing activity are highly desirable features of burrowing owl habitat, they



A family of burrowing owls at Warm Springs. Photo: San Francisco Bay Bird Observaotry.

facilitate the proliferation of tall, nonnative plants on the disturbed areas. Tall mustard and nonnative thistles choke the entrance of the burrows and/or restrict predator visibility.

At Warm Springs a grazing program is used to keep the vegetation short which benefits all of the unit's rare species. However, additional weed abatement methods are necessary to control weed invasions on the burrow areas. Unfortunately, due to the large acreage of Warm Springs, more manpower is needed. The refuge relies on partners and volunteers to help keep the vegetation short on the burrows. Staff and volunteers are engaged in weeding activities from spring through fall.

Besides nesting habitat, high quality foraging habitat is necessary for successful burrowing owl conservation. High quality foraging habitat is also correlated to higher breeding success. This translates to a diverse matrix of microhabitats that support abundant prey.

Prey food items, such as small rodents and lizards, are attracted to rock and debris piles and native perennial and annual plants. In the summer at Warm Springs, we regularly observe owls feeding on the bottom of vernal pools where the short green vegetation hosts a plethora of insects. Insects comprise the highest percentage of owl diets during the summer months. For this reason, planting native plants that thrive in warm

weather to attract insects is very beneficial.

Other complex community dynamics may affect the population status. For example predation from mammalian and avian species affects nesting success and survivorship of the owls.

After three years of implementation of a project focused on the enhancement of burrowing owl habitat at Warm Springs, we started seeing a small increase in the number of breeding owls. We have a long way to go and we wish to see more rapid population growth to bolster the South Bay population.

While we are adjusting our strategies on what we have learned, we need your help on improving habitat for this charismatic species and for all other vernal pool grassland species.

As a volunteer, you will experience one of the last remaining vernal pool grassland habitats in the San Francisco Bay Area, a place that is truly unique and special. Learn about its ecology and conservation activities form staff. You may even spot a burrowing owl!

If interested, please contact me at Aidona_kakouros@fws.gov or Ivette Loreda at Ivette_Loreda@fws.gov.

Aidona Kakouros is the Botanist/Ecologist for the San Francisco Bay National Wildlife Refuge Complex. Her work focuses primarily at the Warm Springs Unit of the Don Edwards San Francisco Bay National Wildlife Refuge.

The year 2017 was a year of prioritization for the San Francisco Bay National Wildlife Refuge Complex. In addition to staff reviewing and evaluating thousands of species and hundreds of surveys that are conducted on the seven refuges in the refuge complex, our conservation work continued. Here are just a few of the highlights.

Antioch Dunes

The winter rains spurred large numbers of endangered Antioch Dunes evening primrose to sprout in the new dunes created at the Stamm unit. Several hundred



Refuge staff placing block on the Stamm Unit. Photo: FWS

primroses self-propagated, indicating that if the habitat is there, this species will take advantage. Unfortunately, the rains, and subsequent warm temperatures, also allowed invasive vetch to overwhelm many of the native plants on the Sardis and Stamm units. Much of the time spent on the refuge was trying to control vetch. Thanks to the California Conservation Corps for helping with this effort.

Other partners helping with restoration at Antioch Dunes Refuge included school and scout groups planting naked-stemmed buckwheat, the host plant for the endangered Lange's metalmark butterfly, and other native nectar plants. The peak numbers of Lange's metalmark butterflies counted this

Refuge Reflections by Anne Morkill will return in the spring issue.

summer was 67 butterflies.

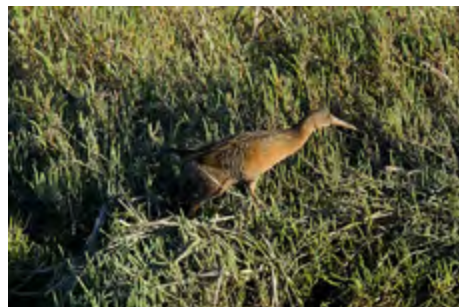
The Stamm Unit also looks different this year. Several 4,500-pound concrete blocks were placed along the western boundary of the unit. The low wall will prevent the sand from blowing onto our neighbors' properties during high winds, and retain the sand for dune habitat.

Don Edwards San Francisco Bay

The refuge welcomed new Refuge Manager Jared Underwood in the spring. Endangered Ridgway's rail surveys received

a new bay-wide protocol with significant input from refuge complex biologists, and sandhill cranes were spotted at the Warm Springs unit in the spring!

Heavy winter rains filled vernal pools to maximum levels and stimulated breeding activity of the threatened California tiger salamander and the endangered vernal pool tadpole shrimp. The 2017 season recorded a record number of pools supporting the breeding of both these species and the ponds



California Ridgway's rail. Photo: Aric Crabb



Staff and volunteers seining for vernal pool creatures. Photo: FWS

held water for much longer than average.

The refuge, through a Coastal Conservancy grant awarded to the San Francisco Bay Wildlife Society, hired interns to conduct outreach to new audiences. Nearly 5,500 youths and adults were reached through the interns' efforts in three months! The refuge also held its first Black History Month event in February which included a showing of *Through the Eyes of a Buffalo Soldier* and video interview with renowned National Park Service Buffalo Soldier Interpreter Shelton Johnson. A discussion followed led by interns Trisha Thornton and Ennis Chauhan. Other new audiences the refuge reached out to were teens at nearby Alviso Youth Center.



Large California red-legged frog tadpole is on the left. Photo: Julie Kitzenberger

Ellicott Slough

During summer of 2017, federally-threatened California red-legged frog metamorphs (young frogs newly transformed from tadpoles) were spotted for the first

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Refuge Dispatches



Northern Fur Seal. Photo: Adam Brown

time in Ellicott Pond. The red-legged now joins the federally-endangered Santa Cruz long-toed salamander and the federally-threatened California tiger salamander in successfully breeding at this location.

An Americorps crew on loan from the Bureau of Land Management worked at the refuge for two days helping to clear trees downed by the severe spring storms from roads and trails.

Farallon Islands

The name of Farallon National Wildlife Refuge was changed to Farallon Islands National Wildlife Refuge. The more descriptive name will help reduce confusion as to what the refuge is actually called!

The refuge saw high numbers of seal and sea lion pups this past year. California sea lion set an island record count of 500 pups in July. Not to be outdone, Steller sea lions pups reached a high count of 44 pups, which is among the highest in the last 40 years. Northern fur seals also had good numbers of pups this year. Unfortunately, elephant seals pups did not fare as well. Many of these pups were lost due to storm surges.

Breeding seabirds fared well this year despite nesting later than normal and breeding failures farther north. The Farallon Islands host the largest seabird breeding colony in the lower 48 states.

In response to increasing air temperatures that can cause birds to overheat, Point

Blue Conservation Science researchers installed 30 clay Cassin's auklet ceramic nest boxes to replace wooden ones to determine if the clay boxes help keep the nests cooler. The plan is to replace all 400 Cassin's and rhinoceros auklet nest boxes if all goes well.

Marin Islands

This small island refuge utilized volunteer groups to help with management. The local California Native Plant Society conducted a native plant survey on the islands and the Americorps crew on loan from Bureau of Land Management assisted with weed management for a few days.

The refuge was created for its heron and egret rookery on the west island. Unfortunately, this year had a low number of breeding pairs, possibly due to trespassing.

Salinas River

The refuge partnered with the Monterey Bay LiMPETS program (Long-term Monitoring Program and Experiential Program for Students) to bring the students



Smith's blue butterfly. Photo: Jared Klein

of Castroville Elementary School to Salinas River National Wildlife Refuge. The program uses citizen science to monitor coastal ecosystems. Refuge staff developed activities to augment the monitoring program experience and teach the students about coastal dune habitat.

Staff and volunteers conducted surveys for the federally-endangered Smith's blue butterfly from June to August, counting butterflies in the backdune habitat. Results showed steady numbers throughout the survey period, but the overall peak count was lower than in previous years.

After a rough start to the federally-threatened Western snowy plover breeding season with all early nesting attempts at the refuge wiped out by raven depredation, the season got back on track with mid-season plover chicks successfully fledging by summer's end.

San Pablo Bay

Restoration continues at the Cullinan Unit. Approximately 300,000 to 400,000 cubic yards of dredge material is being deposited on the east side of the unit to build up the marsh plain. In the Sonoma Baylands Unit which was opened to tidal flow in 1995, 23 endangered Ridgway's rails were detected in the restored marsh.

Several public events took place with the help of partners. Our sister refuge, Yukon Flats National Wildlife Refuge from Alaska, presented in schools in the North Bay and participated in the San Francisco Bay Flyway Festival. Sonoma Land Trust continues to hold docent-led tours at the Dickson Ranch Unit, and Point Blue Conservation Science's Students and Teachers Restoring a Watershed program brings kids to the refuge to plant native vegetation on the transition zone levee at Sonoma Creek.

Sonoma Land Trust also held its first Bay Camp for 7 to 12 year old kids at Sears Point and Dickson Ranch Units. The kids learned about the refuge system, conservation, and wildlife while enjoying bike rides and kayaking.

The Tubbs fire in October 2017 burned more than 200 acres at the Sear's Point Unit, but no lives were lost. A back burn most likely helped save the refuge office and other facilities at the site.

San Francisco Bay Wildlife Society Quarterly Message

30th Anniversary: San Francisco Bay Wildlife Society's Nature Art Show and 30th Anniversary Celebration was great fun and a resounding success. The artists' works were beautiful. We had a lovely party, and many people came to appreciate the works by Kathy Kleinsteinber, Donald Neff, Shirley Lin, Linda Patterson, Linda Knoll, Matthew Dodder, Julie Long, and Attila Cziglenyi. Watch our website, www.sfbws.com, for a Nature Art Portfolio coming soon. We will put the artists' works on-line for continued sales, with a portion of the proceeds donated to the Society to support our on-going programs at the refuge.

New Exhibit: A new Pollution Prevention Exhibit is available for viewing at the Environmental Education Center. The exhibit was funded by a grant from the Santa Clara Valley Water District, and generous donations from Clean Harbors Environmental Services, Whole Foods Market, and (us) San Francisco Bay Wildlife

Society. Learn how trash affects the short and long-term health of three habitat types through disruption of soil deposition. This exhibit and continued clean up activities will be integrated into the Watershed Watchers Program at the Environmental Education Center. Contact Hope Presley at 408-262-5513 ext. 104 or hope.presley@sfbws.com for more information.

Publications: We hope you enjoyed and learned something new from the four-page insert we published in the fall *Tideline* (last quarter). Watch out for our new book, *Sinking Underwater: A Ghost Town's Amazing Legacy* by Anita Goldwasser and me! This updated book about Drawbridge will be in our nature stores very soon.

Out on the Trail: At one of my Drawbridge programs in September, a participant shared that he leads walks on the Mallard Slough Trail Spur to the Drawbridge viewpoint where he shares interesting facts and stories with young

people. Anybody else out there who has learned something from a U.S. Fish & Wildlife Service program that you have shared with friends, family, neighbors, or colleagues? We'd love to hear from you.

Volunteer Opportunities: Volunteers are vital to the nature stores at Fremont and Alviso, as well as various committees that help the Society function and grow. Reach out to Mary Deschene at Mary.Deschene@sfbws.com or 510-792-0222 ext. 364 for more information or dates!

Your Feedback Desired! We welcome your feedback on the hours at the Visitor Contact Station in Fremont and Environment Education Center in Alviso, and on nature store and San Francisco Bay Wildlife Society goals and mission. Go to www.surveymonkey.com/sfbws_survey to provide your comments.

Check out www.sfbws.com. I also strongly recommend a visit to the National Wildlife Refuge Association website at refugeassociation.org to understand the challenges facing our refuges today.

As always, we welcome your input. Send your thoughts to Ceal.Craig@sfbws.com.

Cecilia (Ceal) D. Craig, PhD

President, SFBWS Board of Directors

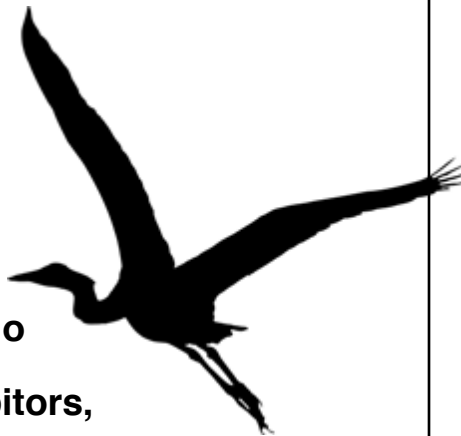
Save the Date!

The 22nd annual San Francisco Bay Flyway Festival

February 9-11, 2018 in Vallejo

Guided wildlife walks, exhibitors,
art show and more!

<https://www.facebook.com/SanFranciscoBayFlywayFestival>



Volunteer Training at the Don Edwards San Francisco Bay National Wildlife Refuge

Train to volunteer at the Fremont Visitor Center desk! Volunteers work a minimum of two shifts a month for a minimum of four months. You must be able to attend both training days to volunteer.

Training dates:

Sunday, December 3: 10:00 a.m. – 3:00 p.m.

Wednesday, December 6: 6:00 p.m. – 8:00 p.m.

To register, visit https://donedwards_infodesk.eventbrite.com.

For more information, call 510-792-0222 ext. 361 for Paul Mueller, or ext. 476 for Carmen Minch.



Traffic Delays on Marshland Road in Fremont

A 0.4-mile stretch of Marshlands Road from Thornton Avenue to the first parking lot is undergoing construction. It is expected to end February 1, 2018. The bridge that crosses over the slough is to be replaced with one that meets earthquake safety standards.

To minimize disturbance to endangered species habitat, a short section of the road will be reduced to one lane with traffic controls. Expect delays when leaving and entering the refuge.

The Harrier Spur Trail and the LaRiviere Marsh Trailhead that connects to Marshlands Rd. will be closed during this time.

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 and September 30, 2017. These gifts will be used for publishing *Tideline*, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.

Leader

Linda Vetter & Terry Blanchard

Sponsor

Helen E Conway

Participant

Paul Babwin, Terry Blanchard, Cheryl Davis, Steve Ferguson, Renee Fitzsimons, Barb Francis, Annie Henzel, Kirsten Holmquist, Marge Kolar, Igor & Shirley May Skaredoff, Terry Smith, Gerald Watanabe

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Senior/Student

Burt Anderson, Patrica Carelli, Erna B Coker, Pat Gordon, Herman Konrad, Nancy Milligan, Joan M Nolen, Ali Shan, Haven Thompson

Donations

AmazonSmile Foundation, Bright Funds Foundation, Beatrice Campione, PayPal Giving Fund, Joyce Fong Wright

Special thanks to Newark Parks Foundation for the Native Plant Nursery



Help Us Protect Your San Francisco Bay Wetlands!

Mail your membership donation to: San Francisco Bay Wildlife Society, P.O. Box 234, Newark, CA 94560. You may also become a member at www.sfbws.com/donate.

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

San Francisco Bay Wildlife Society is a not-for-profit 501(c)(3) organization that 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.

Enclosed is my donation of:

- | | |
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| <input type="checkbox"/> \$100 Participant | |

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

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Thank you for your support!

The San Francisco Bay Wildlife Society has:

- Introduced tens of thousands of students of all ages to the Don Edwards San Francisco Bay National Wildlife Refuge
- Provided weekend staffing at Visitor Centers
- Provided funding for restoration projects, a new boardwalk, trails, a greenhouse and native plant nursery

And much more ...

Become a Supporting Member of the Society. Benefits include:

- Free subscription to *Tideline* newsletter
- Tax deduction to the extent permitted by law
- 15% off at our nature stores
- Free book – *Exploring Our Baylands*
- The joy of helping protect this important environment

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 2

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.

Hike the Mallard Slough

Environmental Education Center, Alviso
10:00 a.m. - 12:00 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. Rain will cancel this hike due to muddy trail. Led by Steve Stolper, certified California Naturalist. RESERVATIONS REQUIRED. Go to <https://hikeectrail.eventbrite.com> Questions? Call 408-262-5513 ext. 104.

Nature Walk for Health

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

Take a break from your busy schedule and refresh your spirit with nature at the refuge. Take a guided nature walk on the Tidelands Trail and hear what makes this National Wildlife Refuge unique. The 1.3-mile walk traverses through endangered species habitat and offers great views of south San Francisco Bay. Meet in front of the Visitor Center. Led by Matt Keehner.

King Tides Salt Marsh Walk

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

Take a walk with docent Gregg Aronson around the wetlands during the King Tides. See examples of salt collection ponds and learn what is being done to convert them back to their original, natural salt marsh state. Hear how wildlife is

affected by the two types of habitat, and why it is important to control the rate of conversion from salt ponds back to the salt marshes. Binoculars and/or a camera are recommended. Register at <http://marshwalk.eventbrite.com> or call 510-792-0222 ext. 363.

Volunteer Orientation - Alviso

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

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.

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.

Sunday, December 3

Visitor Center Desk Training

Visitor Center, Fremont
10:00 a.m. - 3:00 p.m.

The refuge is seeking volunteers to staff the Visitor Center information desk. Once trained, volunteers work a minimum of two shifts a month for a minimum of four months. This training is six hours and broken up into two days. On Day 1, we will walk the trails, discuss the history of the refuge and its mission, learn about the wildlife that lives here, and hear about the benefits of becoming a volunteer. To volunteer at the information desk, you must be able attend both training days. Day 2 training is held on Wednesday, December 6 from 6:00 p.m. - 8:00 p.m. To register, visit https://donedwards_infodesk.eventbrite.com. For more information, contact Paul Mueller or Carmen Minch at 510-792-0222, ext. 361 or 476, respectively.

Saturday, December 9

*Restoring Inner Bair Island

Bair Island Trail, Redwood City
10:00 a.m. - 11:00 a.m.

On this 1.5-mile walk, witness wetland restoration in progress. Hear the story of Bair Island and see how we are turning the former salt pond back into a healthy tidal marsh. RESERVATIONS RECOMMENDED. Go to <http://innerbairtour.eventbrite.com>.

Marshland Homes

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 Colter Cook. Find out why so many creatures call the Don Edwards SF Bay Refuge home by solving

puzzles, playing games and even making your own bird nest! All ages are welcome. Register at <https://eemmarshomes.eventbrite.com>

*Family Bird Walk

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

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. 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.

Holiday Crafts!

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

Spread the holiday cheer by creating fun handmade crafts. These nature-based project ideas make great gifts and decorations. Appropriate for children 6 and older. Register at <http://echoholidaycraft.eventbrite.com> or call 408-262-5513 ext. 102.

Twilight Marsh Walk

Visitor Center, Fremont
4:00 p.m. - 5:45 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. 363. Led by Mary and Gene Bobik.

Saturday, December 16

*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.

Restoration Work Day

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

Interested in volunteering at the refuge? Come out for a restoration work day in preparation for the spring season! We will be working in the Butterfly Garden and surrounding trails. Work will include weeding, mulching, and planting native plants. This is a great opportunity for middle, high, and college students to gain volunteer hours. Great for scout groups and families as well! All ages and skill levels are welcome to join. Gloves and tools are provided. Bring a lunch to enjoy after. Reservations required. Go to: <https://restorationeec.eventbrite.com>. Questions? Call Hope at 408-262-5513 ext. 104.

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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, December 23

*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.

Saturday, December 30

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>.

January

Tuesday, January 2

A Walk Amongst Kings:

King Tides Walk

Visitor Center, Fremont
11:30 a.m. – 12:30 p.m.

Take time out on your lunch break and view the highest tide of the season. Stroll the Tidelands Trail with Carmen Minch and view how tidal marshes help prevent flooding of manmade infrastructure and help to reduce the impacts of sea level rise.

Saturday, January 6

Stewardship Saturday

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

See December 2 for program description.



*Nature Walk for Health

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

See December 2 for program description

*Duck Walk

Visitor Center, Fremont
3:00 p.m. – 4:30 p.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, January 13

Hike the Mallard Slough

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

See December 2 for program and registration information.

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. The Refuge Headquarters offer Webelos programs for up to 15 Webelos. Registration required. Register at <https://donedwardswebelos.eventbrite.com>. Program led by June Smith.

*Salt Marsh Walk

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

Take a walk with docent Gregg Aronson around the wetlands of the wildlife refuge and learn about their history. See examples of salt collection ponds and learn what is being done to convert them back to their original, natural salt marsh state. Hear how wildlife is affected by the two types of habitat, and why it is important to control the rate of conversion from salt ponds back to the salt marshes. Binoculars and/or a camera are recommended. Register at <http://marshwalk.eventbrite.com> or call 510-792-0222 ext. 363.

Volunteer Orientation – Alviso

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

See December 2 for program information and registration information.

Twilight Marsh Walk

Visitor Center, Fremont
4:00 p.m. – 5:45 p.m.

See December 9 for program description and registration information.

Saturday, January 20

*Family Bird Walk

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

See December 9 for program description and registration information.

Saturday, January 27

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> or call 408-262-5513 ext. 102 for reservations.

Indicators that Fox are in Your Area

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

See December 30 for program description and registration information.

February

Thursday, February 1

A Walk Amongst Kings:

King Tides Walk

Visitor Center, Fremont
12:30 p.m. – 1:30 p.m.

See January 2 for program description.

Saturday, February 3

Stewardship Saturday

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

See December 2 for program description and registration information.

Hike the Mallard Slough

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

See December 2 for program and registration information.



*Nature Walk for Health

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

See December 2 for program and registration.

Volunteer Orientation – Alviso

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

See December 2 for program and registration information.

Junior Refuge Ranger

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 San Francisco Bay National Wildlife Refuge from its wildlife to its plants. You'll taste pickleweed while 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. Best suited for ages 8-11. RESERVATIONS REQUIRED. Go to: <http://jrrefugeranger.eventbrite.com>.

Saturday, February 10

Ohlone in the Marsh

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

Did people live here 10,000 years ago? 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 8 and up. Register at: <http://eecoahlonerope.eventbrite.com> or call 408-262-5513 ext. 102.

*Twilight Marsh Walk

Visitor Center, Fremont
4:30 p.m. - 6:15 p.m.

See December 9 for program and registration information.

Saturday, February 17

*Salt Marsh Walk

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

See January 13 for program and registration information.

*Family Bird Walk

Visitor Center, Fremont
2:00 p.m. - 4:00 p.m.

See December 9 for program and registration information.

Volunteer Orientation - Fremont

Visitor Center, Fremont
3:00 p.m. - 4:00 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.

Saturday, February 24

Webelos Adventure Into the Wild

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

See January 13 for program and registration information.

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 fea-

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.

ture 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>.

Indicators that Fox are in Your Area

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

See December 30 for program and registration information.

Black
Friday...

...Cyber
Monday

#GIVINGTUESDAY™
November 28, 2017

#GivingTuesday is a global day of giving when people around the world contribute to and promote the causes they care about. Supporting the San Francisco Bay Wildlife Society on Giving Tuesday is as easy as 1-2-3:

- 1) Donate to support the environmental and educational mission of the San Francisco Bay Wildlife Society at: www.sfbws.com/donate
- 2) Apply for your employer matching gift (if available)
- 3) Share your support on your social networks using #GivingTuesday

Thank you!



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.**

Field Trips at the Learning Center in Fremont

Wetland Round-Up Field Trip

We anticipate offering the field trip program March – May 2018. Please note that due to staffing and budget we may reduce the number of available field trip dates.

Instructions about scheduling a spring 2018 field trip will be posted on our website on **Wednesday, November 15, 2017**. You will be notified about your status the week of December 4, 2017.

https://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/WetlandRoundUp_Fremont.html

Contact the Environmental Education Staff at Fremont:

Office: 510-792-0222 ext. 475

Cell: 510-377-7269

email: tia_glagolev@fws.gov

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Field Trips at the Environmental Education Center in Alviso

Wetland Round-Up Field Trips

We anticipate offering the field trip program March – May 2018. Please note that due to staffing and budget we may reduce the number of available field trip dates.

Instructions about scheduling a spring 2018 field trip will be posted on our website on **Wednesday, November 15, 2017**. You will be notified about your status the week of December 4, 2017.

https://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/WetlandRoundUp_Alviso.html

Wetland Round-Up Field Trip Workshops

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

Contact the Environmental Education Staff at Alviso:

Office: 408-262-5513 ext. 100

Cell: 510-377-5250

email: genie_moore@fws.gov

Living Wetlands Program

The Living Wetlands program 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 activi-

ties 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, call Colter Cook, Living Wetlands Program Coordinator, at 408-262-5513 ext. 102 or at Colter.Cook@sfbws.com.

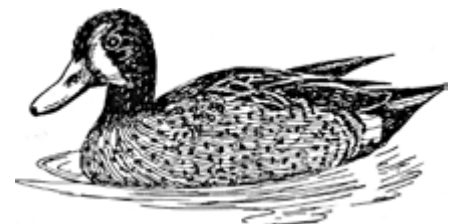
Programs for Colleges and Universities at the Environmental Education Center in Alviso

Staff-led Field Trips

Guided field trips by staff generally last 1 ½ to 2 hours. Reservations must be made at least eight weeks in advance of the desired field trip date. Please contact Hope Presley at 408-262-5513 ext. 104 or at hope.presley@sfbws.com.

College Instructor-led Excursions

Instructors from area colleges can lead their own field excursions at the Environmental Education Center in Alviso. All college instructors planning this type of excursion must make a reservation at least eight weeks in advance of a desired 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 Hope Presley, at 408-262-5513 ext. 104 or at hope.presley@sfbws.com.



Application for 2017-2018 Blue Goose Bus Funds

The Blue Goose Transportation Fund was started with funding from the U.S. Fish & Wildlife Service's Connecting People with Nature Program. The San Francisco Bay Wildlife Society has provided additional funding for the 2017-2018 school year through a generous grant from the City of San Jose and the California Coastal Conservancy's Explore the Coast program. The program is administered by the U.S. Fish & Wildlife Service and San Francisco Bay Wildlife Society staff.

The fund was created to help Title 1 schools and schools with proven 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.

Please refer to our website for more information at <https://go.usa.gov/xRVMJ>. You may also contact Genie Moore at 408-262-5513 ext. 100 or at genie_moore@fws.gov.



New Maps on Don Edwards San Francisco Bay Refuge Website

By Gregg Aronson, Refuge Docent

Did you know you can track hiking distances on maps that you can download to your smart phone? They are PDF maps that have geospatial data embedded in them (GeoPDF maps).

The Don Edwards San Francisco Bay National Wildlife Refuge website currently has three such maps available on its website.

These maps allow you to view your current location (within the map boundaries), track your hiking or biking distance, record your start time and duration, and place markers with precise GPS locations, just to name a few features. GeoPDF maps work without wi-fi or data connections, which means you can use them without incurring data charges. You don't even need to be within range of a cell tower.

The maps are stored on your smart phone. To use the maps, you need an app such as Avenza Maps. Avenza Maps is available free of charge. The free version of the app allows you to import up to three GeoPDF maps at a time. Install Avenza Maps from your phone's app store.

The easiest way to get the maps is to download them ahead of time to your own computer. To get maps from the refuge, connect to the following web address: https://www.fws.gov/refuge/don_edwards_san_francisco_bay/map.html After the map page loads, scroll to the bottom of the page where the links to the refuge GeoPDF maps are located. After you download the maps to the computer, connect your smart phone to the computer to copy the maps to your phone.

Come to the *Intro to Geo PDF Maps* program on Saturday, February 24 at 10:30 a.m. for a slide show with on how to use the maps. Information on finding maps at other sites and creating your own GeoPDF maps will be included.

TIDELINE

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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

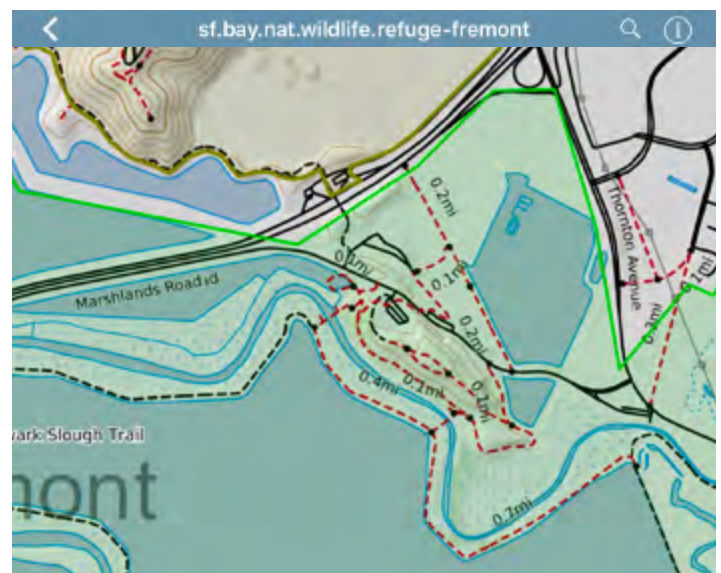
Administered by the U.S. Fish & Wildlife Service, San Francisco Bay National Wildlife Refuge Complex exists to preserve wildlife habitat, protect threatened and endangered species, protect migratory birds, and provide opportunities for nature study. Seven refuges are managed from the headquarters in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

WINTER 17-18
Volume 40, Number 4

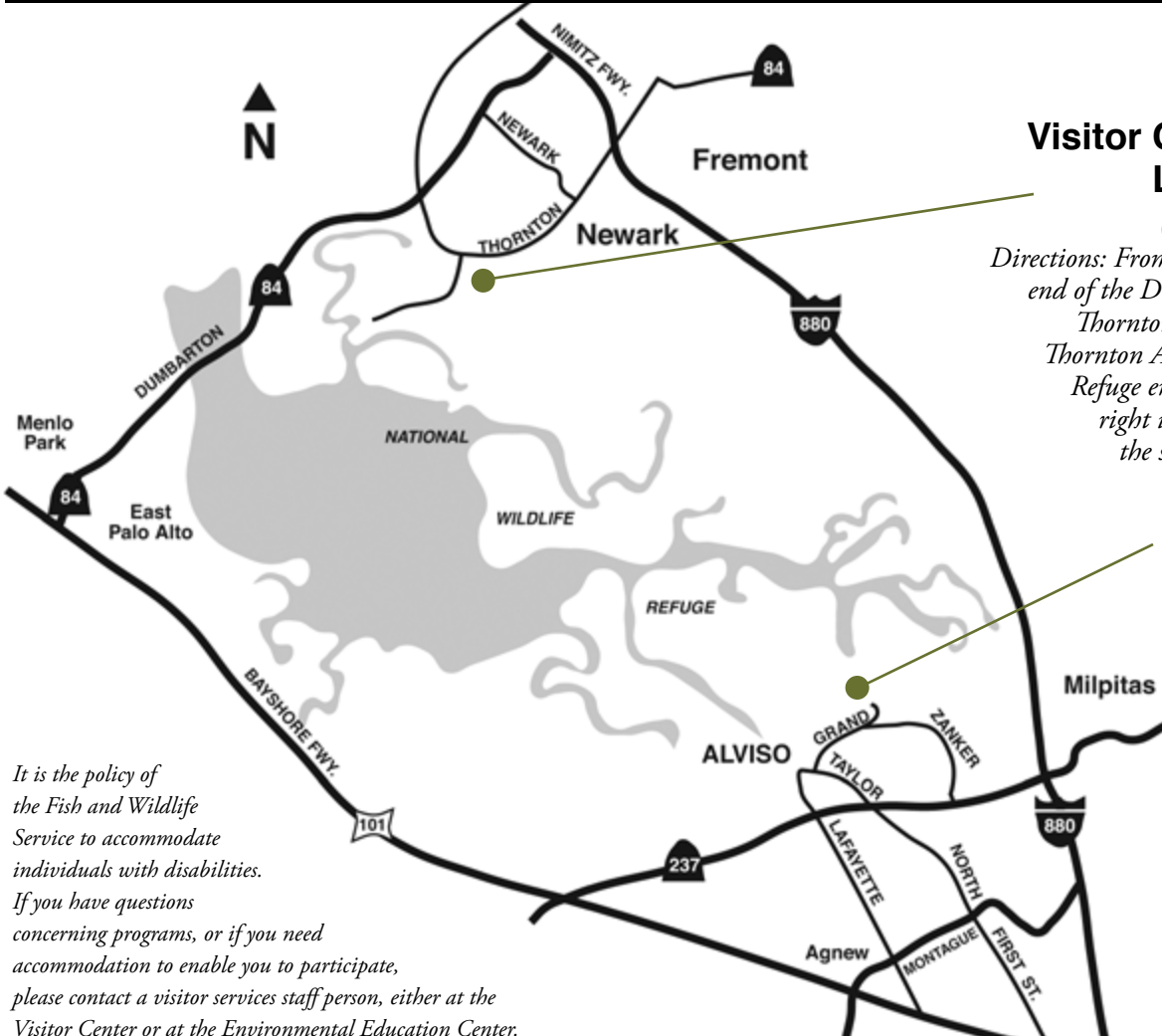


Tideline

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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.