

SUMMER 2011

Volume 32, Number 2

Tideline



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

Island Life for Salamanders

By Russ Bradley and Ryan Berger

Sharing its origins with the core of the Sierra Nevada Mountains, the Farallon Islands were violently shaken free from the mainland some 10,000 years ago. In the ensuing years the Farallones have drifted northwest as a result of movements from the Pacific Plate and currently reside 27 miles west of the Golden Gate and 18 miles southwest of Point Reyes. The Farallon National Wildlife Refuge provides habitat for a great assortment of wildlife. Hosting the largest seabird colony in the contiguous United States, the islands provide nesting grounds for over 300,000 breeding birds. In addition, large numbers of seals, sea lions, and white sharks frequent the islands and their adjacent waters. Many winged migrants, like song birds and even bats will stop over on the islands during their travels. We at PRBO Conservation Science, in partnership with the U.S. Fish and Wildlife Service, have been conducting monitoring,



PRBO Conservation Science

research, and stewardship efforts on the refuge for over 40 years.

Until recently, our work has focused almost entirely on animals which either fly or swim their way to the islands. However, recently we have started study of an unlikely Farallon inhabitant - the Farallon Arboreal Salamander - that hitched a ride on the islands' slow but steady drift northward on the Pacific Plate after the islands were separated from the mainland.

The arboreal salamander, *Aneides lugubris*, is endemic to California and Mexico, occurring in coastal and interior oak forests, but also on islands, from Humboldt County, CA to northern Baja California. This group of salamanders has no aquatic larval stage - eggs are laid in terrestrial nests and hatchlings resemble miniature adults. Females will lay their eggs on the underside of moist damp places - like decaying trees on the mainland, or under rocks in damp areas of the island. They are primarily nocturnal, foraging for small prey such as spiders, beetles, grubs, ants, and centipedes on the ground or on the trunks of trees. During the day



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they remain under rocks, decaying logs, and in stone walls and crevices. Arboreal salamanders are unusual in that they have enlarged toe tips and a prehensile tail adapted for climbing, which serves them well in their habitat on the mainland. However, this adaptation may not fare so well on the Farallones, seeing that trees are few and far between. Arboreal Salamanders are more tolerant of dry conditions than other lungless salamanders, and are often the last species to retreat beneath ground when the dry season begins. Lungless salamanders conduct respiration through their skin which requires them to live in damp environments on land, not in water,

continued next page

and to move about on the ground only during times of high humidity.

The arboreal salamander is the only native terrestrial vertebrate inhabiting the Farallon Islands. The distinctive spot pattern of the salamanders on the islands led Van Denburgh (1905) to consider the population as a sub-species *A. lugubris farallonensis*. PRBO biologists have been checking for the presence of salamanders bimonthly since 2007 under cover boards, which are used both to provide burrowing habitat and to permanently mark study plots. Arboreal salamanders exhibit high site fidelity, and we often find the same animals under particular cover boards. Individuals are measured, weighed, and sexed by looking for eggs in a female's translucent belly or the male's distinctive mental gland under the chin, involved in pheromone production.

These salamanders possess unique spot patterns much like finger prints on humans which allow biologists to track them over time. A photo database of captured salamanders has been created for long-term mark-recapture monitoring. Some individuals are quite easily distinguishable by anomalies such as missing limbs or extra digits. Salamanders are common on the island starting in late fall, when the first rains come, and disappear underground in the summer when the soil dries out.



PRBO Conservation Science

A recent report and publication based on Farallon salamander data has been completed, led by Derek Lee, our former PRBO winter biologist who initiated



Southeast Farallon Island

this study. This research has made some fascinating discoveries. We have found that the species has a delayed maturity, with an average age of breeding maturity of three years. Adult survival was high, with 78-88% of adults surviving from one year to the next. Using size data to compare with other salamander species, we estimate that Farallon salamanders can be very long lived, with average adult life spans of eight to eleven years. Amazingly, these parameters resemble those of seabirds like Cassin's

Auklets, and those of Northern Elephant Seals.

So why is it important to study these wet, slimy amphibians that spend much of their time underground? Many salamander populations around the world currently are experiencing threats from chemicals, infectious diseases, global warming and increasing

climatic variability. In particular, arboreal salamanders are lungless and offer unique attributes that make them good indicators of ecosystem health. Breathing through

moist, well-vascularized skin makes them vulnerable to changes in water or air quality. Baseline demographic data are helpful in documenting effects of existing and future threats to salamander populations – particularly unique ones like we have here on the Farallones. By obtaining data now and continuing to monitor into the future, we can better manage salamander populations on the island and hopefully be able to use these salamanders as another indicator species of ecosystem health.

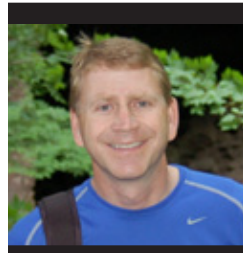
Russ Bradley is the Farallon Program Manager for PRBO Conservation Science. Originally from Vancouver Island, Canada, he completed his Bachelors and Masters degrees in Biology from Simon Fraser University in Vancouver. This year will be his 11th field season on the Farallones, where he has spent over 1200 days in the field working with PRBO's long term seabird ecology studies.

Ryan Berger just completed his first season as winter Farallon Biologist from PRBO. Ryan got his Bachelors degree from the University of Illinois and his Masters from Georgia Southern University. Before coming to work at PRBO, Ryan coordinated marine mammal research and standing response for the Florida Fish and Wildlife Conservation Commission in Jacksonville.

Staff remains dedicated, even in tough times

On April 8, the National Wildlife Refuge System nearly shut down along with the rest of the Federal government due to a lack of a budget to carry us through the remainder of the fiscal year. Along with the other 800,000 government employees nationwide, our staff that care for 50,000 acres on seven national wildlife refuges in the Monterey and San Francisco Bay areas were expecting to be sent home. As the possibility of a furlough became close to reality, I watched our employees become quite concerned about not only what a shutdown might mean to their personal financial security but also their work obligations. The only thing that was clear about the possible shutdown was just how unclear things were. They started asking to what extent will our refuges be closed to the public during a shut down? Who must be notified? Are researchers allowed to continue their work on our refuges? Must employees travelling as part of their jobs be required to return home before the budget deadline? Would employees continue to receive health care and other benefits during a shut down? Would we get paid? These were only a handful of questions that we were all dealing with.

It is natural for anyone to be concerned about their livelihood in a time of so much uncertainty, but the extent our staff began to worry about the wildlife under our care and the public we serve was extraordinary. As



Refuge Reflections

by Mendel Stewart

we received more information, we learned that we were not allowed to volunteer our services should the government close. We were told we would be prohibited from using our computer systems and mobile phones, or even stepping foot back in the office after taking a few hours to “close out” on the first day of the furlough.

As the realization that we would not be able to care for our resources sunk in, many began to grasp the seriousness of the situation. For example, endangered California Least Terns had just been spotted around their nesting site in Alameda, where we manage the largest nesting colony in northern California. Each year, prior to the terns nesting, we place shelters on the 10-acre site to protect newly hatched chicks from predators and the sun’s heat. This work was scheduled for the weekend following the possible shutdown. Not knowing how long the shutdown would last if it occurred, our staff scrambled to organize a team to get

the site work done before the fast approaching deadline. In the meantime, our visitor services staff quickly contacted area schools scheduled to visit to make sure they were aware of the potential closure. We were also notified by an adjacent landowner that he could not get to his property because an eight-foot diameter tree on San Pablo Bay NWR had fallen across the road, blocking all access. Our staff responded swiftly, taking chainsaws and tractors to the site and working into the evening to get the roadway cleared before the deadline.

All these actions and many more took place in the final 36 hours before the impending shutdown was predicted to occur. These are just a few examples, but I think they illustrate the dedication of our staff. Even in uncertain financial times — for agency budgets and personal budgets, alike — our staff showed that wild things, wild places and the public we serve, come first.

It’s Official: Skaggs Island is now part of San Pablo Bay National Wildlife Refuge

The final documents have been signed between the U.S. Fish and Wildlife Service and the U.S. Navy to transfer Skaggs Island, a former naval base, to the Service for inclusion in the San Pablo Bay National Wildlife Refuge, effective March 31.

The 3300-acre island increased the size of the 13,000-acre San Pablo Bay National Wildlife Refuge by a quarter and added a much-needed haven in the North Bay for birds and other wildlife.

“Skaggs Island is a missing piece of the puzzle for restoration in the North Bay, and we’re excited to see it become part the

refuge,” said Don Brubaker, manager of the San Pablo Bay National Wildlife Refuge. “Thanks to great teamwork between the Navy and the U.S. Fish and Wildlife Service, and the support and cooperation of a lot of partners, we were able to make it happen.”

Congresswoman Lynn Woolsey (D-CA), a key advocate for the restoration of Skaggs Island, introduced legislation in 2008 that enabled the property to be transferred from the Navy to the Service. In 2010, the Navy demolished more than 100 structures and completed an extensive environmental cleanup of the site, which

served as a naval communications base from 1942 to 1993. The island is one of the largest diked wetlands in the North Bay, and is located 40 miles northeast of San Francisco, near the shore of San Pablo Bay in Sonoma County.

The San Pablo Bay National Wildlife Refuge was created in 1974 to protect migratory birds, wetland habitat and endangered species like the salt marsh harvest mouse and California clapper rail. The refuge and San Pablo Bay support the largest wintering population of canvasbacks on the West Coast.

Gulls Gone Wild!

By Cheryl Strong, Wildlife Biologist

In the early 1980s a group of avian ecologists from San Jose State University made a surprising discovery while surveying the salt ponds near the South Bay: a new colony of breeding birds, of a species never before known to nest coastally! Thus the first California Gull colony was found by the San Francisco Bay Bird Observatory in the dry salt pond known as A6 on the Don Edwards San Francisco Bay National Wildlife Refuge.

The San Francisco Bay estuary is an important wintering and migratory site for hundreds of thousands of birds along the Pacific Flyway, including a dozen species of gulls. But prior to circa 1982 the only gulls nesting here were a handful of Western Gulls. Now the vast majority of gulls left in the South Bay after migration are California Gulls.

California Gulls are a wide-spread species and are commonly found in urban areas. Happy to live on the leftovers of their human neighbors at landfills, parking lots, and dumpsters, California Gulls thrive in the Bay Area. Over the past 28 years, their numbers have continued to increase rapidly: over 23,000 California Gull nests were counted in the South Bay in 2010. The largest colony has consistently been the original breeding site in pond A6 with over 11,000 nests last year. In addition, the number of colonies has grown to 10 active nesting sites.

As the number of California Gulls continues to increase, so does the concern over their effects on other nesting birds. Research by the San Francisco Bay Bird Observatory has caught California Gulls on camera eating the eggs and newly hatched chicks of Western Snowy Plovers, a threatened species that also nests on dry salt ponds. U.S. Geological Survey has documented high levels of predation on American Avocets, Black-necked Stilts, and Forster's Terns that nest on islands in ponds adjacent to gull colonies.

In December 2010, as part of the South Bay Salt Pond Restoration Project, pond A6 was restored to tidal action for the benefit of endangered tidal marsh species and for overall improved health of the South Bay. With the introduction of tidal waters into the site,



California Gull on nest. Photo by R. Golden

gulls have lost a large portion of their nesting area. Only a few high spots that are not under water at high tide still exist within the pond. Therefore, over 20,000 gulls may be looking for a new home this nesting season. For the past three years, the San Francisco Bay Bird Observatory and U.S. Geological

Survey have been banding California gull adults and chicks in the hopes of discovering where they might relocate after the breach of pond A6. Gulls banded at pond A6 have been spotted at other Bay gull colonies, and as far away as Orange County, Mendocino County, and Southeast Farallon Island.

The 2011 nesting season has already begun here on the Don Edwards Refuge. Avocets and Snowy Plovers are sitting on eggs. California Gulls have begun to establish pair bonds and nesting territories; nests, eggs, and chicks will soon follow. With the help of the San Francisco Bay Bird Observatory and U.S. Geological Survey, we are closely monitoring for new gull colonies that may be starting up and continuing to monitor existing colonies to see if they increase in size. In addition, research on nesting success of shorebirds and terns continues as we try and balance management of nesting birds and restoration for endangered tidal marsh species.

You can help by reporting any banded gulls you see while bird watching and by reporting any new nesting colonies of gulls. To learn how you can help, and for more information about the project, log on to <http://www.sfbbo.org/science/waterbird.php>.



California Gulls on pond A6 before the levees were breached. Photo by R. Golden

New I&M Program Helps Refuges Adapt to Climate Change

By *Orien Richmond*

Imagine stepping into a time machine that transports you to the year 2050. What will the San Francisco Bay look like? How warm will it be and how high will the waves reach? How clean will the water and air be? What animal and plant species will occupy the Bay's shorelines and coastal areas? Refuge biologists and managers are struggling to answer these and other questions in the face of substantial uncertainty about climate change, even as they make immediate decisions about management actions, habitat restoration goals and land acquisition targets for the Refuge System.

To help guide the Fish and Wildlife Service's response to climate change and other stressors, a new National Wildlife Refuge System Inventory and Monitoring (I&M) Program was launched in 2010. This national program will address the Refuge System's mission-critical information needs (such as baseline inventories of biotic and abiotic resources on refuges), support the Service's landscape conservation efforts, assess landscape-scale changes in species distributions, predict refuge vulnerability to climate change, and assist refuges with data storage, synthesis and analysis.

Here in Region 8 (California, Nevada and the Klamath basin in Oregon), our I&M team is already up and running. Our staff include Karen Laing (Regional Coordinator), Giselle Block (I&M Specialist), Kaylene Keller (Database Manager), Rachel Esralew (Hydrologist) and Rita Howard (Administrative Support), most of whom are located at California State University Sacramento. I was lucky enough to be stationed here at San Francisco Bay National Wildlife Refuge Complex. Similar I&M teams have been hired in other regions across the country.

Now that the I&M Program is operational, how will we help the Refuge System respond to potential threats from climate change? First, let's talk a bit more about the likely impacts.

An army of climate scientists around the globe are hard at work developing global-scale models to predict future

climatic conditions (<http://www.ipcc.ch/>), but no single model is going to be 100% correct. Rather, climate modelers typically forecast a range of predictions based on different starting assumptions, yielding a set of possible future scenarios that provide upper and lower bounds on key variables such as temperature and precipitation. Still more modeling is then needed to "downscale" global climate models using historic local temperature and precipitation data for use at the local level. Some of these downscaling efforts are now bearing fruit, offering agencies, cities and businesses a first glimpse at relatively fine-scaled predictions.

What do these downscaled models say about climate change in our region? Researchers at NASA Ames have predicted for the San Francisco Bay that by 2050:

- average temperatures could rise by 2-4°F
- sea level could rise by 6-9 inches
- precipitation could increase OR decrease up to 15 percent
- [The number of] days per year above 90°F could increase from 8 to 15.

Source: <http://www.climatecentral.org/blogs/nasa-visualizes-sea-level-rise-in-san-francisco-bay-area/>

Facilitating the adaptation of fish, wildlife and plants to the projected shifts in climate is a huge undertaking and presents enormous technical challenges. We will be exploring several approaches that could be used within the Refuge System to facilitate adaptation to climate change, including:

- acquiring buffers, establishing corridors, and eliminating dispersal barriers;
- using prescribed burning to reduce risk of catastrophic wildfire
- assisting species with limited dispersal abilities
- providing interim food propagation for mis-timed migrants
- restoring existing and establishing new marshland vegetation as sea levels rise

Past management decisions have generally been directed toward maintaining or restoring historic environmental condi-



I & M Biologists surveying shorebirds in the distance. FWS photo

tions. Now, adaptation may mean managing towards less certain future conditions. Furthermore, individual species are likely to shift ranges independently of one another, resulting in the formation of new ecological communities. In the face of these and many other challenges, the I&M Program is likely to be a key asset for the growth and development of the Refuge System. As the I&M program continues to evolve, we look forward to sharing our findings with you!

Orien Richmond, Ph.D. is a Wildlife Biologist for the Inventory and Monitoring Program in the Pacific Southwest Region. He is stationed at the San Francisco Bay National Wildlife Refuge Complex Headquarters.



This Place is for the Birds

By Doug Cordell, Public Affairs Officer

“Birds are expanding their range across the bay... growing in population.”

That was the good news trumpeted in a recent front-page story in the *San Jose Mercury News*, on the heels of scientific reports about the progress of the five-year-old South Bay Salt Pond Restoration Project. If the historic effort to turn 15,000 acres of former industrial salt ponds back to wetlands is a success, thousands of marsh-dependent birds will be returning to the lands of the Don Edwards San Francisco Bay National Wildlife Refuge in the years ahead.

But what about the shorebirds and waterfowl that have come to inhabit the levees and open waters of the man-made salt ponds? What's to become of the Western Snowy Plovers, Marbled Godwits, Ruddy Ducks, scaups and Gadwalls now that ponds are being restored to tidal marsh? The restoration project was designed to provide habitat for them, too—but on a smaller footprint, made possible by cutting-edge design, high-end technology, and intensive monitoring and management by refuge staff.

Industrial salt ponds around the San Francisco Bay date back to the 1850s; some are still in operation today. The production



Aerial view of pond SF2. Photo by Cris Benton



Willetts, Marbled Godwits, and Black-bellied Plovers Photo by Judy Irving

process is a fairly passive one. Water is let in from the bay and allowed to course through a series of evaporation ponds, progressively increasing in salinity until it reaches a final, crystallizer pond where the salt is harvested. The result has been the creation of an extensive network of ponds and levees where marsh once ringed the bay. Over the decades, shorebirds and waterfowl came to migrate and live on the open pond waters and dry levees. Many of them were driven from California's Central Valley, when land there was drained for agriculture.

When the plan was developed to acquire the salt ponds as refuge land and restore them to marsh, an important consideration was the fate of the shorebirds and waterfowl. The decision was made to set aside a portion of the land to accommodate them. That meant designing a mix of open water and dry habitat on smaller acreage and intensively managing the new ponds with sophisticated equipment.

The first of the “managed ponds,” known as SF2, near Palo Alto, was unveiled in September 2010 in a ceremony key-noted by Senator Dianne Feinstein, one of the original champions of the restoration project. What Senator Feinstein and others saw that day was a designed landscape of open water, man-made islands and dry pan, bordered by levees with large weirs

and gated culverts to regulate water levels. They also saw features along the main levee designed for public access, including a walking trail, viewing platforms and interpretive displays.

Now, biologists are monitoring Pond SF2 for bird population counts, nesting success and water quality.

“We’re already seeing great use of the pond by Willetts, Least Sandpipers, Dunlins and other shorebirds,” says Cheryl Strong, wildlife biologist for the Don Edwards San Francisco Bay Refuge. “And we’re also seeing lots of waterfowl, like Northern Shovelers and Northern Pintails.”

In the fall, construction will begin on similarly designed ponds outside the refuge’s Environmental Education Center in Alviso, CA.

“Managed ponds like these require a lot of work: adjusting weirs and culverts for water levels and doing regular levee maintenance,” says refuge manager Eric Mruz. “But it’s worth the effort if we can provide habitat for birds that don’t have many other places to go.”

Congratulations to the 29th Annual Endangered Species Poster Contest Winners

Congratulations to all 465 participants who entered in the Don Edwards San Francisco Bay National Wildlife Refuge 29th Annual Endangered Species Poster Contest! This contest is held annually for schools in Union City, Newark, Fremont, and East Palo Alto. Thank you to all who entered. First, second, and third place finishers in each grade level from Kindergarten to 6th grade along with Honorable Mentions can be viewed on-line at www.fws.gov/desfbay/contest.htm. Posters were judged for their concept, composition, color and expression.

A huge thank you to the San Francisco Bay Wildlife Society for sponsoring the contest!



Sierra Van Rossem, 4th Grade, Milani Elementary



Teresa Le, Kindergarten, Pioneer Elementary



Julia Zhan, 1st Grade, Chadbourne Elementary



Garima Gupta, 3rd Grade, Pioneer Elementary



Krish Kumar, 2nd Grade, Warwick Elementary



Manssi Vitthanala, 5th Grade, Pioneer Elementary



Alissa Xiao, 6th Grade, Maloney Elementary

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, 2011 and March 31, 2011. These gifts will be used for publishing Tideline, capital, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.

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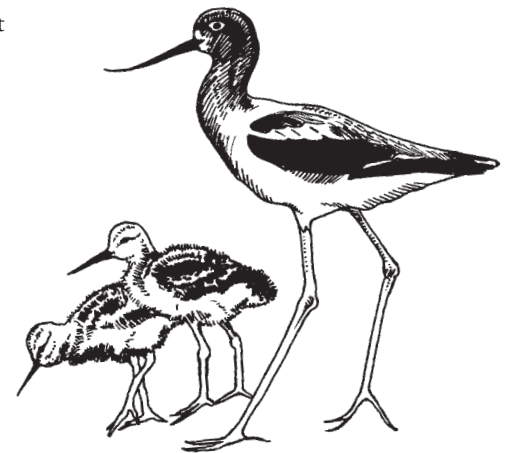
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Help Us Help the Refuge

Mail your donation to: San Francisco Bay Wildlife Society, P.O. Box 234, Newark, CA 94560. You may also fax your membership donation using a Visa or MasterCard number to (510) 792-5828.

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

San Francisco Bay Wildlife Society is a nonprofit 501(c)(3) organization which raises money and awareness for the San Francisco Bay National Wildlife Refuge Complex.

YES! I want to support San Francisco Bay Wildlife Society and its programs with my membership. My dues include a subscription to Tideline and 15% discount at the Don Edwards SF Bay National Wildlife Refuge bookstore. Enclosed is my contribution of:

- \$20 Student/Senior
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Summer Activity Schedule

JUNE

Sunday, June 5

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 from the Visitor Center. Bring a yoga mat and/or beach towel. 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. Call 510-792-0222 ext. 363. Led by Carmen Minch.

*Water Wizards

Environmental Education Center, Alviso

2:00 p.m. – 3:30 p.m.

Life on the Blue Planet would not be possible without our most precious resource, water. Join us at the EEC to learn more about the unique properties of water through hands-on activities, a presentation, and a guided wetlands walk. We will investigate what makes water such an important resource to people and wildlife, and probably get a little wet too! RESERVATIONS RECOMMENDED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

Saturday, June 11

Presenting: Great American Backyard Campout

Environmental Education Center, Alviso

10:30 a.m. – 12:00 p.m.

Saturday, June 25th is the National Wildlife Federation's Great American Backyard Campout! This is a call to get everyone outside to create lasting memories in our great outdoors! Come find out about this awesome event, and learn some camping basics, such as how to pitch a tent or pack efficiently for travel. We'll also play campfire games and create a yummy treat for when you're hungry and on-the-go! All ages welcome! Call Debra at 408-262-5513 ext. 102 for reservations.

San Francisco Bay: From the Gold Rush to Today

Visitor Center, Fremont

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible history of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Program is indoors. All are welcome.

Sunday, June 12

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 other wildlife including 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 mountain, trail, or hybrid bicycles highly recommended. Helmets are required. Recommended for more experienced bicyclists. Rain cancels. Call 510-792-0222 ext. 363 for reservations.

*Wetlands Restoration: The 50-year Journey

Environmental Education Center, Alviso

11:00 a.m. – 12:00 p.m.

Follow the progress of the largest wetlands restoration project on the West Coast. Learn about the 50-year plan to restore a mix of wetlands habitats to the South Bay. Program will begin indoors but will move outside via an easy 0.25-mile trail to a view of the salt ponds. All are welcome!

Barn Swallow Hike

Visitor Center, Fremont

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

Join Roy Sasai to view the Barn Swallows, their nests, and their habitat. The swallows have arrived from their long voyage from South America to their breeding grounds here in the Bay Area. Meet outside of the Visitor Center to learn about this species' natural history and their habits. We will hike to spots on the refuge to view their unusual homes. Bring binoculars and a camera. This hike is recommended for the young and young at heart. The hike is 1 mile total with medium hills.

Saturday, June 18

Newark Slough Trail – 5.0 miles roundtrip

Visitor Center, Fremont

9:00 a.m.

Let's Go Outside!

Meet new people while getting fit and healthy! This is the 3rd walk featured in the Refuge Rambler club. This trail is compacted dirt, flat and level. The walk is self-paced and you may turn back at any time. You do not need to be a Refuge Rambler to join this walk. Go to <http://www.fws.gov/desfby> to learn more about the Refuge Rambler Club. No reservations are needed. Hats, water, and sunscreen are strongly recommended. Led by Jenn Nielsen.

Wetland Safari

Environmental Education Center, Alviso

9:30 a.m. – 11:00 a.m.

Take a one-hour van tour around our former salt ponds. Bird life is generally more abundant out toward the bay. We will make several stops for better viewing and photography (if desired), plus a look at what is left of Drawbridge. Due to limited van seating, a second tour will begin at 11:00 if needed. Reservations are essential, so please call Debra at 408-262-5513 ext. 102.

We Built it for the Birds Ravenswood Unit (SF2), Menlo Park

11:00 a.m.

Docent Jane Moss will lead you on a 1-mile walk through the ever-changing panoramas surrounding a former salt pond. Learn about the exciting ways this area is being reshaped as newly created wildlife habitat. Trail is easy and level. All ages and abilities welcome. For information, please call 510-792-0222 ext. 139.

Go WILD at the Nature Play Day!

What: Unstructured free play using nature materials

Where: Don Edwards SF Bay NWR Environmental Ed. Center - Alviso

When: Sunday, July 17
Noon to 3PM

Who: All ages are welcome.

Call Eric for information:
(408)262-5513 ext. 104

Join us for this fun new program! We will provide your family with a natural space and sustainably collected materials from the refuge. The rest is up to you! Go WILD and build and make creations using your imagination. This program is provided in partnership with the Children in Nature Collaborative.



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

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Summer Activity Schedule

Saturday, June 18

Twilight Marsh Walk

Visitor Center, Fremont

7:30 p.m. - 9:00 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363. Led by Mary and Gene Bobik.

Sunday, June 19

Nature Drawing for Kids

Visitor Center, Fremont

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

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363. Bring binoculars if you have them.

*Father's Day in The Marsh

Environmental Education Center, Alviso

3:00 p.m. - 4:30 p.m.

Show Dad how much you care by taking him on a relaxing 'stay-cation' to the Environmental Education Center, where he will be treated to a special presentation about animal parents! We will explore how wildlife raise their young, and possibly see some examples during a guided tour through the New Chicago Marsh. RESERVATIONS RECOMMENDED - All ages are welcome. Call Eric at 408-262-5513 ext. 104.

Saturday, June 25

*Why Tides Matter

Environmental Education Center, Alviso

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

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

A Trip Back in Time

Visitor Center, Fremont

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

Revive the vanishing knowledge of the history of the Don Edwards San Francisco Bay National Wildlife Refuge grounds by strolling the trails with docent Ray Studer. Hear about the on-site salt production, railroads, and homes that were located on the refuge grounds until the 1950s. Using a collection of old photographs, the last vestiges of a way of life can be traced back to the 1850s that led to the construction of the town of Newark in 1876.

*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. Call 510-792-0222 ext. 363.

Sunday, June 26

Intro to Nature Drawing for Adults

Visitor Center, Fremont

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

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Program begins in the pavilion. Bring binoculars if you have them. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

*A Taste of the Refuge

Visitor Center, Fremont

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

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

JULY

Sunday, July 3

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 from the Visitor Center. Bring a yoga mat and/or beach towel. 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. Call 510-792-0222 ext. 363. Led by Carmen Minch.

Saturday, July 9

*Coyote Creek Lagoon - 4.0 miles roundtrip

Fremont - Directions below.

9:00 a.m.

Let's Go Outside!

Meet new people while getting fit and healthy! This is the 4th walk featured in the Refuge Rambler club. This trail is a compacted gravel levee that is flat and level. The walk is self-paced

and you may turn back at any time. You do not need to be a Refuge Rambler to join this walk. Go to <http://www.fws.gov/desfbay> to learn more about the Refuge Rambler Club. No reservations are needed. Hats, water, and sunscreen are strongly recommended. A refuge representative will be there to greet you.

Directions: From I-880, take the Fremont Blvd/Cushing Pkwy exit. Drive south on Fremont Blvd, until it ends. There is a parking lot on the right next to 48481 Fremont Blvd, Fremont. Meet in the parking lot. There are no restroom facilities.

A Trip Back in Time

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

Visitor Center, Fremont

Revive the vanishing knowledge of the history of the Don Edwards San Francisco Bay National Wildlife Refuge grounds by strolling the trails with docent Ray Studer. Hear about the on-site salt production, railroads, and homes that were located on the refuge grounds until the 1950s. Using a collection of old photographs, the last vestiges of a way of life can be traced back to the 1850s that led to the construction of the town of Newark in 1876.

Sunday, July 10

*A Taste of the Refuge

Visitor Center, Fremont

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

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

Saturday, July 16

*Lazy Days of Summer

Environmental Education Center, Alviso

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

The hectic days of locating a nesting site and mating are over. Now our wildlife friends are busy raising their families. Join refuge volunteer Ed Kantack on a leisurely walk to observe summer living on our refuge. Open to all ages. Call Debra at 408-262-5513 ext. 102 for reservations.

Exploring the Refuge by Bike

Alviso Marina County Park, Alviso

10:00 a.m. - 1:00 p.m.

Bring your bike and join docent Steve Dill on a 9-mile journey to learn about the history, biology and restoration of the refuge's salt pond landscape. This trail will appeal to both bicyclists and birders. Ride is moderately strenuous over unpaved but level levees. Helmets and water requested. Binoculars and camera encouraged. Reservations required at 510-792-0222 ext. 139. Rain cancels.

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

Visitor Center, 2 Marshlands Road, Fremont - (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso - (408) 262-5513

***We Built it for the Birds**

Ravenswood Unit (SF2), Menlo Park

11:00 a.m.

Docent Jane Moss will lead you on a 1-mile walk through the ever-changing panoramas surrounding a former salt pond. Learn about the exciting ways this area is being reshaped as newly created wildlife habitat. Trail is easy and level. All ages and abilities welcome. For information, please call 510-792-0222 ext. 139.

Drawbridge Van Excursion

Environmental Education Center, Alviso

1:00 p.m. – 3:30 p.m.

There's a ghost town in the San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two-fisted rowdies? Find out at this program, led by Ceal Craig. We'll start with a slideshow, and then take a short van excursion to view Drawbridge across Coyote Creek. Program is intended for adults and space is very limited. RESERVATIONS ARE ESSENTIAL. Call Debra at 408-262-5513 ext. 102. (Note: we do not visit the town itself – we go to the closest spot that one can legally view Drawbridge.)

Twilight Marsh Walk

Visitor Center, Fremont

7:30 p.m. - 9:00 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363. Led by Mary and Gene Bobik.

Sunday July 17

Nature Drawing for Kids

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363. Bring binoculars if you have them.

Nature Zone Play Day

Environmental Education Center, Alviso

12:00 p.m. – 3:00 p.m.

Join us for family play day to spark creativity and imagination in the beautiful surroundings of Don Edwards San Francisco Bay National Wildlife Refuge. This NEW program is unstructured, we provide the space and a variety of natural materials sustainably collected from our grounds, the rest is up to you! Build a fairy den, mouse home, tule boat or anything you want, and enjoy some time in nature without all of the instruction – just play and go WILD! This program is provided in partnership with the Children in Nature Collaborative. RESERVATIONS RECOMMENDED – All ages are welcome. Call Eric at 408-262-5513 ext. 104

Barn Swallow Hike

Visitor Center, Fremont

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

Join Roy Sasai to view Barn Swallows, their nests, and their habitat. The swallows have arrived from their long voyage from South America to their breeding grounds here in the Bay Area. Meet outside of the Visitor Center to learn about this species' natural history and their habits. We will hike to spots on the refuge to view their very unusual homes. Bring binoculars and a camera. This hike is recommended for the young and young at heart. The hike is 1 mile total with medium hills.

Saturday, July 23

***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. Call 510-792-0222 ext. 363.

Sunday, July 24

***Marshlands of Dreams**

Visitor Center, Fremont

10:30 a.m. – 11:30 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. There are opportunities for bird watching as well.

***Wetlands Restoration: The 50-year Journey**

Environmental Education Center, Alviso

11:00 a.m. – 12:00 p.m.

Follow the progress of the largest wetlands restoration project on the West Coast. Learn about the 50-year plan to restore a mix of wetlands habitats to the South Bay. Program will begin indoors but will move outside via an easy 0.25-mile trail to a view of the salt ponds. All are welcome!

Saturday, July 30

Moffett Bay Trail – 6.7 miles roundtrip

Sunnyvale-Directions below.

8:30 a.m.

**Let's Go
Outside!**

Meet new people while getting fit and healthy! This recently opened trail is the 5th walk featured in the Refuge Rambler club. It is a compacted dirt levee that is flat and level. The walk is self-paced and you may turn back at any time. You do not need to be a Refuge Rambler to join this walk. Go to <http://www.fws.gov/desfbay> to learn more about the Refuge Rambler Club. No reservations are needed. Hats, water, and sunscreen are strongly recommended. A refuge representative will be there to greet you.

Directions: From Hwy 101 or 880 exit onto Hwy 237 towards Alviso. Take the Caribbean Dr. exit and head north onto Caribbean Dr. Turn right on Borregas Ave. At the stop sign in front of the sewage treatment plant, take a left onto Carl Rd. and park in the far parking lot.

Summer Activity Schedule

Monster Bacteria & Other Suspicious Critters

Environmental Education Center, Alviso

10:00 a.m. – 12:00 p.m.

Let's explore the salt marsh's hidden habitats! See monster bacteria, of which some love rotten eggs, and some make the air we breathe. Join Microbial Ecologist Dr. Wayne Lanier for a short hike where we will use field microscopes to dive down into a tiny world – an ecology hidden from view. Ages 8 to 80 and beyond! Call Debra at 408-262-5513 ext. 102 for reservations.

All About Owls

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

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

San Francisco Bay: From the Gold Rush to Today

Visitor Center, Fremont

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes to the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible history of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Program is outdoors. All are welcome.

Sunday, July 31

Life at the Bottom of the Food Chain

Visitor Center, Fremont

10:00 a.m. – 12:00 p.m.

Wetlands microbes are often called "the lungs of the earth." Explore the dynamics of microbial communities in LaRiviere Marsh ponds. Join microbiologist Wayne Lanier, PhD for a brief presentation; then a microscope hike to LaRiviere Marsh where we will sample and view the most ancient creatures on earth. See how they produce the oxygen we breathe and take up the carbon dioxide we produce. Discover how tides shape these vital communities. Easy short hiking level. Ages 9-90 years. Call 510-792-0222 ext. 363 for reservations.

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

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Summer Activity Schedule

Intro to Nature Drawing for Adults

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

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Dress for the weather. Bring binoculars if you have them. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

Wetlands Water Cafe

Environmental Education Center, Alviso
3:00 p.m. – 4:30 p.m.

Chow down! During this program we will explore food chains, and learn about the different food sources provided by our wetlands for both humans and wildlife. We will use lab equipment to look at marsh organisms, and think about how they are related to each other. A guided walk through the wetlands follows. RESERVATIONS RECOMMENDED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

AUGUST

Saturday, August 6

*Marshlands of Dreams

Visitor Center, Fremont
10:30 a.m. – 11:30 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. There are opportunities for bird watching as well.



Sunday, August 7

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 from the Visitor Center. Bring a yoga mat and/or beach towel. 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. Call 510-792-0222 ext. 363. Led by Carmen Minch.

Nature Drawing for Kids

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

Does your child have an interest in the arts? Introduce your child to outdoor sketching in this workshop by Travis Turner and increase their observations skills. We will learn how to draw what we see by incorporating common shapes, and learn about color value. We will then head out onto the trail and practice the various techniques. Paper and pencils will be provided. This program takes place outside. Rain cancels. Kids age 7-12 only! Call for reservations at 510-792-0222 ext. 363. Bring binoculars if you have them.

Saturday, August 13

Explore the Weep

Environmental Education Center, Alviso
10:00 a.m. – 1:00 p.m.

Join expert Microbial Ecologist Dr. Wayne Lanier on a short van ride to study microbial communities. The Weep is a shallow persistent pond fed by seepage. Throughout the year, it undergoes very wide swings in salinity, and the result is a uniquely rich microbial community of Cyanobacteria, Archeobacteria, Diatoms, Dinoflagellates, and protozoa. Boots are recommended! Ages 10 and up. RESERVATIONS REQUIRED. Call Debra at 408-262-5513 ext. 102.

*We Built it for the Birds

Ravenswood Unit (SF2), Menlo Park
11:00 a.m.

Docent Jane Moss will lead you on a 1-mile walk through the ever-changing panoramas surrounding a former salt pond. Learn about the exciting ways this area is being re-shaped as newly created wildlife habitat. Trail is easy and level. All ages and abilities welcome. For information, call 510-792-0222 ext. 139.

*Family Bird Walk

2:30 p.m. – 4:30 p.m.

Visitor Center, Fremont

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. Call 510-792-0222 ext. 363.

Aerial Kite Photography

Environmental Education Center, Alviso
3:00 p.m. – 5:00 p.m.

Using aerial kite photography, photographer Cris Benton has been keeping an incredible visual record of the South Bay salt ponds and wetlands. In the first hour, Cris will introduce us to aerial photography and what it reveals to us about the landscape we live in. Then we'll move outdoors for a demonstration. Weather depending, Cris will launch the kites and record a bird's eye view of the world! Call Debra at 408-262-5513 ext. 102 for more information.

Twilight Marsh Walk

Visitor Center, Fremont
7:00 p.m. - 8:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 1/3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 363. Led by Mary and Gene Bobik.

Night Sky Party

Environmental Education Center, Alviso
8:30 p.m. – 10:30 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. Call Debra at 408-262-5513 ext. 102.

Sunday, August 14

Beginning Bird Drawing

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

You don't have to be Picasso to enjoy drawing! Join us for this introductory program to help you get started on a fun nature observation hobby. Bring a sketchbook or some paper and a pencil (or we can loan you some), and we will cover some basic concepts of pencil and line drawing. We will then practice on refuge specimens and mounts. RESERVATIONS REQUIRED – Ages 10 and up. Call Eric at 408-262-5513 ext. 104.

Rise of Coyote Hills...

It's about time

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

Join Roy Sasai on a hike to learn about and view the inner core of the Coyote Hills. What forces created this magnificent hill along the bay? What forces continue to move and shape the vista we see? What forces made a huge portion of Coyote Hills disappear? We will meet at the Visitor Center

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

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

to begin our adventure, then hike 1.5 miles on steep terrain to view the core of Coyote Hills. This hike is recommended for the young and young at heart. Bring binoculars and a camera. Reservations not required.

Saturday, August 20

Drawbridge Van Excursion Environmental Education Center, Alviso

9:30 p.m. – 12:00 p.m.

There's a ghost town in the San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two-fisted rowdies? Find out at this program, led by Ceal Craig. We'll start with a slideshow, and then take a short van excursion to view Drawbridge across Coyote Creek. Program is intended for adults and space is very limited. RESERVATIONS ARE ESSENTIAL. Call Debra at 408-262-5513 ext. 102. (Note: we do not visit the town itself – we go to the closest spot that one can legally view Drawbridge.)

Exploring the Refuge by Bike Alviso Marina County Park, Alviso

10:00 a.m. – 1:00 p.m.

Bring your bike and join docent Steve Dill on a 9-mile journey to learn about the history, biology and restoration of the refuge's salt pond landscape. This trail will appeal to both bicyclists and birders. Ride is moderately strenuous over unpaved but level levees. Helmets and water requested. Binoculars and camera encouraged. Reservations required at 510-792-0222 ext. 139. Rain cancels.

*Butterflies, Etc.

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

Do you know the difference between butterflies, moths and skippers? Let's learn about these beautiful creatures, their life cycles, and their amazing journeys. Then take a leisurely walk around our butterfly garden and see some of these beautiful insects. Suitable for ages 7 and up. Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.

Saturday, August 27

Redwood Shores Trail – 5 miles roundtrip

Meet in front of Marriot Towne Place Suites.

Directions Below.

9:00 a.m.

**Let's Go
Outside!**

Meet new people while getting fit and healthy! This trail in Redwood Shores is flat and level. The walk is self-paced and you may turn back at anytime. No reservations are needed.

Hats, water, and sunscreen are strongly recommended. A refuge representative will be there to greet you at 9 a.m.

Directions: From northbound 101, take the Holly St/Redwood Shores Parkway exit. From southbound 101, take the Holly St/Brittan Ave exit. Head east towards Redwood Shores Parkway. Turn right on Twin Dolphin Dr and meet at 1000 Twin Dolphin Dr, Redwood City. Meet in parking lot in front of Marriot Towne Place Suites.

*Why Tides Matter

Environmental Education Center, Alviso

1:00 p.m. – 2:00 p.m.

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

Bird Photography for Beginners

Environmental Education Center, Alviso

2:00 p.m. – 4:00 p.m.

Learn basic field techniques, composition, lighting, and camera equipment for photographing birds in the wild. We will also discuss what birds are commonly seen at the refuge. Bring your camera along with its manual if you need help setting it up. If time permits, we will test your newly acquired skills outside. Led by Alex Baranda. Recommended for ages 14 and up. Call Debra at 408-262-5513 ext. 102 for reservations.

San Francisco Bay: From the Gold Rush to Today

Environmental Education Center, Alviso

2:00 p.m. – 3:00 p.m.

Since the Gold Rush, human development has caused dramatic changes the San Francisco Bay. Join docent Art Garibaldi as he shares the incredible history of the death and rebirth of the Bay. Learn how local citizens struggled to save the Bay and its wetlands. Their success has led us to a promising new future. Program is indoors. All are welcome.

Sunday, August 28

Intro to Nature Drawing for Adults

Visitor Center, Fremont

10:30 a.m. – 12:30 p.m.

Learn the basics of sketching nature. We will learn how to draw with negative shapes and shadows, and how to use color and light to add dimension. We will discuss how the changing horizon lines can offer depth. There will be opportunities to practice these techniques on the trail. Paper and pencils will be provided. Dress for the weather. Bring binoculars if you have them. Call for reservations at 510-792-0222 ext. 363. Led by Travis Turner.

Summer Activity Schedule

Mysteries of Wastewater Treatment

Environmental Education Center, Alviso

2:00 p.m. – 3:30 p.m.

The San Jose-Santa Clara Water Pollution Control Plant treats hundreds of millions of gallons of wastewater from millions of people every day using some of the most advanced treatment technologies available. Come and learn about what it takes to make this interesting process happen through a slideshow and hands-on activities at the refuge. RESERVATIONS RECOMMENDED – All Ages are welcome. Call Eric at 408-262-5513 ext. 104. (There will not be a tour of the Water Pollution Control Plant as a part of this program.)



**The San Francisco Bay
National Wildlife Refuge
Complex is now on
Facebook!**

Like us and receive
timely updates about the
Complex and see photos
of wildlife.



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

Visitor Center, 2 Marshlands Road, Fremont – (510) 792-0222 ext. 363 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

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 Slow the Flow 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 Orientation Workshop. The Orientation Workshop allows 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 Orientation Workshop. It is our policy that lead educators must attend training every two years. Location of activities and trail conditions may vary. Please call for accessibility information.

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

Field Trips at the Learning Center in Fremont

Wetland Round-Up Field Trips

The Wetland Round-up field trip program in Fremont is undergoing a revision. New scripts and some new activities will be developed to further enhance learning at this site. Therefore, we will NOT BE OFFERING THE REGULAR WETLAND ROUND-UP PROGRAM IN THE FALL 2011. During this time, limited opportunities will be available for classes to visit and assist us with the pilot. If you are a teacher interested in having your class participate and help us with this project, please contact the Environmental Education staff AFTER AUGUST 15, 2011. See our contact information below. Updates about the revision will be posted on our website, and we hope to unveil our new offerings in Spring 2012. Details about scheduling a Spring 2012 field trip will be posted on our website and in the Winter issue of Tideline. Thanks for your understanding and support during this transition.

Contact the Environmental Education Staff at Fremont:

Office: (510) 792-0222 x 475

Cell: (510) 377-7269

E-mail: ee.refuge@yahoo.com

Field Trips at the Environmental Education Center in Alviso

Wetland Round-Up Field Trips

Investigate the butterflies in the butterfly garden, taste pickleweed in the salt marsh, or discover the creatures that live in the slough water on a Wetland Round-Up Field Trip. This field trip program is designed for up to 65 students in grades K-6. Wetland Round-Up is offered Monday – Thursday from October to December, 2011.

We will begin scheduling Fall 2011 field trips on Thursday, September 8, 2011 from 4-5 pm.

We will begin scheduling for Spring 2012 field trips on Tuesday, December 13 from 4-5 pm.

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

We are in the process of revising the teacher and parent orientation to better serve you. More information and dates will be announced in the fall.

For more information call the Environmental Education Staff at Alviso:

Office: 408-262-5513 ext 100

Email: genie_moore@fws.gov

Slow the Flow Program

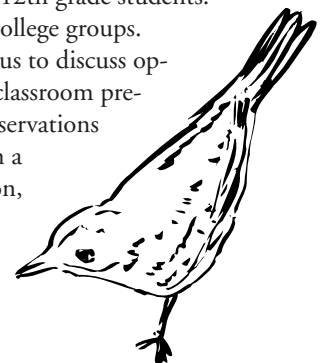
Slow the Flow provides an experiential learning environment for students and educators to explore the topics of water use, wastewater treatment, and habitat preservation. Activities and presentations focus on the relationship between personal habits and their effects on local habitats. Slow the Flow is an environmental education program offered at no cost through the cooperating efforts of the City of San Jose, U.S. Fish and Wildlife Service, and the San Francisco Bay Wildlife Society. Slow the Flow programs are available to educators and groups located in San Jose, Alviso, Milpitas, Santa Clara, Saratoga, Monte Sereno, Los Gatos, Campbell, and Cupertino.

Programs are offered to 5th and 12th grade students.

A modified field trip is available for college groups.

Educators are encouraged to contact us to discuss options for customizing field trips and classroom presentation activities and schedules. Reservations

for the Slow the Flow program are on a first-come basis. For more information, or to make a reservation for summer or fall, call Eric McKee, the Slow the Flow Program Coordinator at 408-262-5513 ext. 104 or email at sfbay.slowtheflow@gmail.com.



Scout and Youth Group Programs

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

Below are the names, dates, and descriptions of the programs. Programs at the Environmental Education Center are



sponsored by the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Francisco Bay Wildlife Society.

Youth Group Programs at the Environmental Education Center in Alviso

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

Saturday, June 18

* Brownie Eco-Explorer Patch Environmental Education Center, Alviso 2:00 p.m. – 4:00 p.m.

Come and learn about habitats, food chains, and how you can help wildlife. Then take a walk to explore the habitats at the South Bay. Space is limited to 20 people and program fills quickly.

Saturday, July 9

* Junior Girl Scout Wildlife Badge Environmental Education Center, Alviso 10:00 a.m. – 12:00 p.m.

Calling all Junior Girl Scouts of Santa Clara County! Anyone out there need to earn a Wildlife badge? We've got the program just for you! Come to the wildlife refuge and learn about features of different creatures, observe animal

behavior, see how you can help wildlife, and so much more. Take a walk to explore the habitats at the south end of the bay.

Saturday, August 27

* Webelos Naturalist Badge Environmental Education Center, Alviso 10:00 a.m. – 12:00 p.m.

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

Youth Group Programs at the Refuge Headquarters in Fremont

The Refuge Headquarters offer Webelos programs for up to 15 Webelos. Call 792-0222 ext. 363 for reservations. All programs are led by June Smith.

Sunday, August 21

Webelos Naturalist Program 10:00 a.m. – 12:00 p.m.

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

TIDELINE

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

Volume 32, Number 2

Editor:Carmen Minch

To receive *Tideline*, email carmen_leong-minch@fws.gov, or write to: *Tideline*, San Francisco Bay National Wildlife Refuge Complex, 9500 Thornton Ave, Newark, CA 94560.

San Francisco Bay National Wildlife Refuge Complex

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

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Deputy Project Leader:John Bradley
Wildlife Refuge Specialist:Val Urban

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Don Edwards Wildlife Specialist:Melisa Helton
Don Edwards Warm Springs Unit Manager: Ivette Loreda
Farallon Refuge Manager:Gerry McChesney
Farallon Refuge Wildlife Specialist:Zach Coffman
North Bay Refuges Manager:Don Brubaker
North Bay Wildlife Specialist:Louis Terrazas
South Bay Refuges Manager:Diane Kodama
Public Affairs Officer:Doug Cordell
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San Francisco Bay Wildlife Society

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

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SUMMER 2011
 Volume 32, Number 2

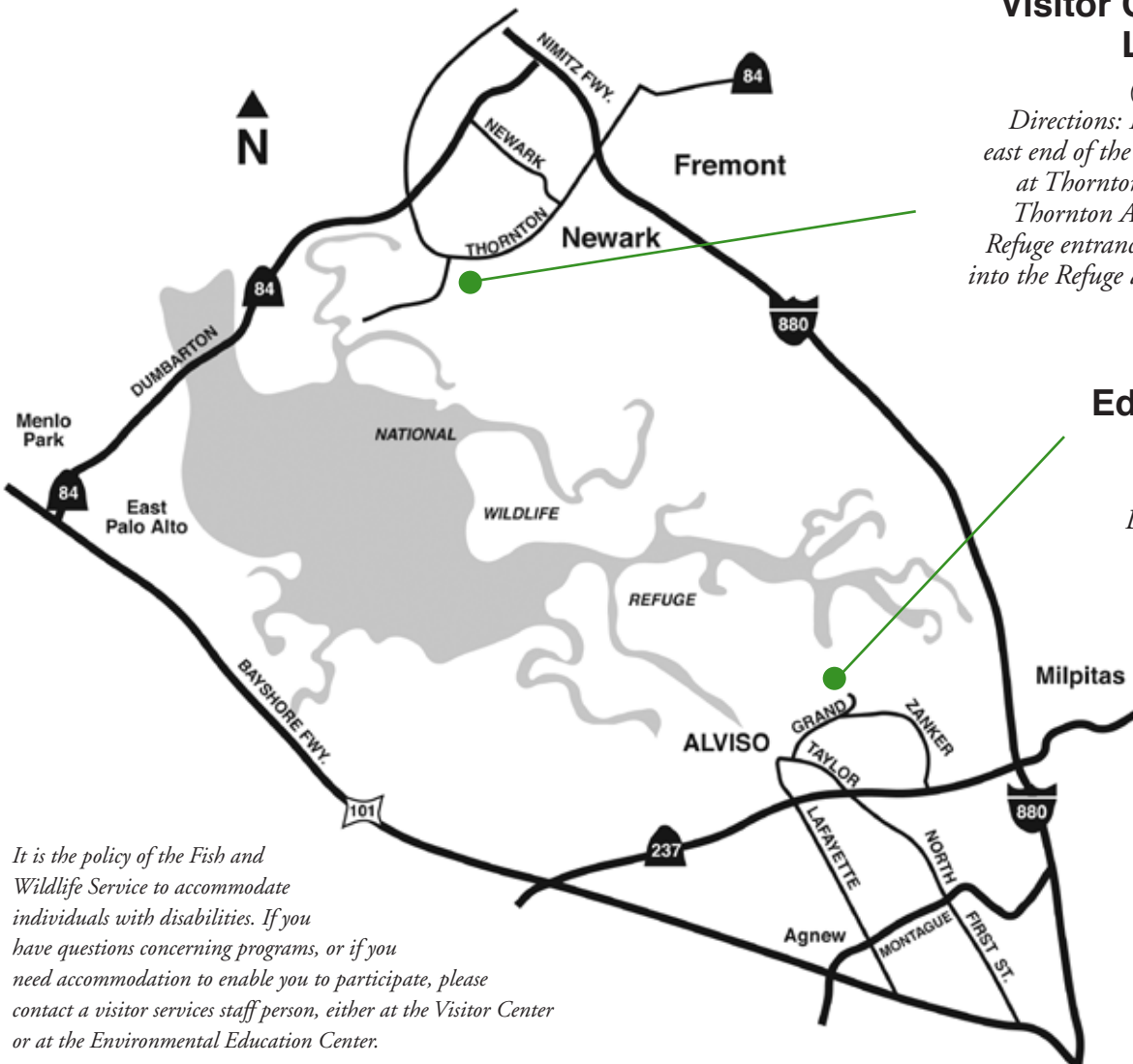
Tideline



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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 Highway 101, exit on Highway 237 toward Mountain View/Alviso. Turn north onto Zanker Road. Continue on Zanker Road to the Environmental Education Center entrance road (a sharp right turn at Grand Blvd.) The distance from 237 to the entrance road is 2.1 miles.

It is the policy of the Fish and Wildlife Service to accommodate individuals with disabilities. If you have questions concerning programs, or if you need accommodation to enable you to participate, please contact a visitor services staff person, either at the Visitor Center or at the Environmental Education Center.