

# Tideline



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

## Local Egret and Heron Research Aids Land Conservation Efforts and Encourages Public Participation

By Kristin Butler

Colonial Waterbirds are essential components of wetland and aquatic habitats across the globe and play key roles within their ecosystems. Because they require specific habitat types and qualities in order to survive, they can be viewed as biological indicators of environmental health and function.

In highly populated urban areas like the San Francisco Bay, human activities and habitat degradation and conversion are some of the factors that affect wetland and upland habitats—and the colonial waterbirds that rely on them. These impacts can include everything from the loss of nesting trees to the contamination of wetland foraging areas. Understanding the status of the Bay Area's colonial waterbirds through research like San Francisco Bay Bird Observatory's Colonial Waterbird Program helps resource managers make informed decisions that protect birds.

For more than 30 years, the San Francisco Bay Bird Observatory has conducted the Colonial Waterbird Program using hundreds of citizen scientists. Thousands of hours were spent observing and collecting data on waterbirds that breed and nest in colonies throughout the region.

The SFBBO is a nonprofit in Milpitas with the mission to conserve birds and their habitats through science and outreach. Since 1981, its biologists, outreach specialists, and citizen science volunteers have conducted avian research and increased public awareness about the status and importance of birds.



*Great Blue Heron. Photo: Gregg Aronson*

### Research Impacts

The data collected in the Colonial Waterbird Program is analyzed by SFBBO science staff and shared in an annual report with biologists at the Don Edwards San Francisco Bay National Wildlife Refuge. It is also shared with other local land managers and with conservation organizations like the Audubon Society, who use it to advocate for bird conservation.

Such a long-term research project that covers such a vast geographical area would be very challenging to do without the participation of citizen scientists. This year, almost 50 volunteers are monitoring 70

colonies throughout the Bay Area.

Even with such a large group of volunteers, there are probably still colonies in the Bay Area that are not included in the study. Therefore, the data collected is not reported as a comprehensive list of colonies, and peak nest numbers should not be used for a Bay-wide population-level trend analysis.

This data *does* have many values, though. It serves as a useful starting point for the development of more comprehensive regional efforts to track population size and trends on a larger scale. It has been combined with the research of others to answer

continued next page

questions about the status of birds in the region. In addition, it provides a detailed account of bird activity within and around the specific colonies SFBBO monitors, which (as earlier noted) is useful to local land managers.

Another benefit of the program is that it engages people from the public in bird conservation—through citizen science opportunities and also through the “Birds in Your Neighborhood” community events SFBBO offers to introduce people to the colonies near them.

## Hérons And Egrets

Four of the bird species studied in the Colonial Waterbird Program are Great Blue Herons, Great Egrets, Snowy Egrets, and Black-crowned Night Herons. These charismatic and majestic birds were once nearly hunted to extinction because their plumes were used to make ladies’ hats. But conservationists fought to protect them, leading to the passage of the Migratory Bird Treaty Act enforced by the U.S. Fish and Wildlife Service and the formation of the Audubon Society. The birds have made a good comeback.

Each January, a training session for volunteers in the program is offered on the natural history and breeding behavior of these (and other) colonial waterbirds and the scientific protocols SFBBO uses to study them. One of the first steps is learning how to differentiate between the four species that share many similarities but are also distinct in various ways.

With a five- to six-foot wingspan and standing three to four feet high, Great Blue Herons are the biggest of the four. Despite their grand size, they only weigh about five pounds because their bones (like the bones of other birds) are hollow. Their bills are heavy and dagger-like and their long necks



*Black-crowned Night Heron.*  
*Photo: Joseph Garcia*

curve into an “S” shape when they fly across the sky.

Great Egrets are smaller. They weigh a little over two pounds, are three to four feet tall, and have a wingspan of more than four feet. When they fly, they tuck their heads in close to their shoulders and their long legs stick out past their tails.

Snowy Egrets are more petite, reaching about two feet tall and possessing a three-foot wingspan. They have shorter necks and weigh less than a pound.

Black-crowned Night Herons are stocky birds with thick necks, short legs, and large flat heads. They stand around two feet tall, weigh about two pounds, and have wingspans of about three feet. Their short legs barely reach their tails when they are in flight.

The coloring of these birds is also distinctive. The feathers of Great Blue Herons are blue-gray and their faces include patches of white and a black stripe over each eye. Their breeding plumage includes whitish plumes hanging from the front of their necks, gray plumes on their backs, and black plumes that hang off the back of their heads.

Great Egrets have black legs and feet, and feathers that are completely white. During the breeding season they grow special long, wispy nuptial plumes along their back that they raise up in display to find a mate. During breeding season a patch of skin on their faces also turns neon green to indicate their readiness to breed.

Snowy Egrets also have pure white feathers and grow wispy breeding plumage, but they have black legs and yellow feet.

Black-crowned Night Herons are gray and black, and they possess long white head plumes. During courtship, the head and back take on a bluish-green gloss and the legs turn pinkish red.

## Habitat And Hunting

All four of these species breed and for-



*Snowy Egret. Photo: HG Geren*

age in salt, brackish, and fresh water coastal, tidal marsh, and seasonal wetland habitats. Great Blue Herons sometimes also forage in upland fields and meadows.

They eat fish, amphibians, reptiles, crustaceans, and insects and sometimes gophers and other small mammals. In addition, Black-crowned Night Herons (who are known as “opportunistic” hunters) have been seen foraging in dumpsters.

The style each species uses to hunt helps people identify one from the other as well. Great Blue Herons and Great Egrets will usually stalk their prey by standing motionless in shallow water and scanning the area, then quickly piercing their prey with their sharp bills. Sometimes Great Blue Herons will also grasp their prey with strong jaws and shake it to break the spine in order to make the food easier to swallow whole.

Snowy Egrets often stir up the mud with their feet, vibrate their bills, sway their heads, flick their wings, and hop after, hover over, and chase their prey.

Black-crowned Night Herons grasp their prey with their bills instead of stabbing it and generally hunt in the evening and during the night to avoid competing with other species (although during breeding season they sometime also hunt during the day).

## Courtship And Nesting

After completing the training in January, citizen scientists in the Colonial Waterbird Program are assigned a colony and begin monitoring Great Blue Herons in February and the other three species in March.

They continue monitoring the birds through the beginning of July, visiting their colony once or twice a month during specific monitoring weekends and using binoculars and spotting scopes to estimate the number of adult birds, nests, and chicks.

They also note nesting behaviors, such as incubation, nest-building and courtship displays, and any evidence of human disturbance or predation.

Great Blue Herons, Great Egrets, Snowy Egrets, and Black-crowned Night Herons often nest in colonies with different species. They prefer nesting sites that are isolated from ground dwelling predators and that are near good foraging areas.

The males choose the nesting site and usually pick high trees or (for the smaller species) dense-foliage bushes. Then the birds perform elaborate courtship dances—ducking their heads, preening their wings, snapping their bills, and shaking sticks to



*Great Egret. Photo: Alex Baranda*

gain the attention of a mate.

The males of all four species begin building the cup-like nests using twigs, sticks, and other materials and then are joined by their female mates, who take over or assist with nest construction.

The birds lay one to six eggs, which

take 23-29 days to hatch. The adults spend anywhere from 20-81 days (depending on the species) feeding and caring for their young. Once the birds are mature, all the birds disperse to live elsewhere.

SFBBO's research shows that some Bay Area colonies have continued to thrive in the same location for 20-30 years. Because these birds are not banded it is unclear if these colonies are comprised of the same birds from year to year.

Other colonies have collapsed after a short time, sometimes due to observed disturbances in the environment (such as the removal of trees, flooding, or drought) and sometimes for reasons that are not clear.

SFBBO works with land managers to identify issues when possible. The organization also increases community awareness about the importance of bird conservation by offering "Birds in Your Neighborhood" bird viewings for the public to showcase the colonies studied in the project.

To read SFBBO's 2014 Colonial Waterbird Annual Report, attend a SFBBO event. To become a citizen science volunteer, visit [www.sfbbo.org](http://www.sfbbo.org).

*Kristin Butler is the Outreach and Communications Director of the San Francisco Bay Bird Observatory.*

## The Power of Partnerships

I'm often asked how many people work for the San Francisco Bay National Wildlife Refuge Complex. But short of tallying up positions on our organization chart, it's not a straightforward answer. That's because nearly everything we do on our seven refuges is a collective effort of many people above and beyond our own staff. That's the power of partnerships.

Partnerships are a part of our agency's culture. The mission statement of the U.S. Fish and Wildlife Service highlights this right up front: *Work with others* to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people. Through partnerships, we empower more people to become stewards of our natural heritage, which ultimately make us more effective in fulfilling our conservation mission. Partnerships leverage resources and allow us to benefit from their expertise to help meet common goals.

Among our many treasured partners are more than 2,500 volunteers who contribute

more than 50,000 hours annually for a variety of tasks on all seven refuges. In addition to our own dedicated volunteer cadre, assistance also comes to us through Save the Bay, Bay Area Sea Kayakers, and corporate volunteer groups. Partners such as the San Francisco Bay Wildlife Society, Friends of San Pablo Bay NWR, Citizens Committee to Complete the Refuge, and local Audubon Chapters support our mission through their fundraising and advocacy work.

The Peninsula Open Space Trust and Sonoma Land Trust have been instrumental in acquiring open space, much of which has ultimately been transferred to us to manage as part of the National Wildlife Refuge System. The South Bay Salt Pond Restoration Project would not exist if not for the longstanding public-private partnership that began with acquiring former commercial salt ponds from Cargill, and is now an active science-management collaborative

led by the State Coastal Conservancy and includes California Department of Fish and Wildlife, Santa Clara Valley Water District, U.S. Geological Survey, to name just a few. The Conservancy especially has worked tirelessly on our behalf and invested hundreds



of millions of dollars on wetland restoration and conservation efforts on our refuges; for example, the Invasive Spartina Project.

The list goes on and on. There are many key partnerships that I have not called out here due to space limitations, but who nonetheless contribute significantly to our conservation mission. We thank you all and look forward to our continuing collaboration!



# Warm Weather, Warm Ocean Disrupt Wildlife at Farallones

by Melissa Pitkin and Doug Cordell

This winter's unusually warm air and ocean temperatures are disrupting marine wildlife at the Farallon National Wildlife Refuge, as observed by biologists from Point Blue Conservation Science and refuge managers at the U.S. Fish and Wildlife Service. Over the past four months, seals and sea lions are having difficulty reproducing, local seabirds have had low colony attendance, and two tropical species of seabird have shown up on the island, far from their normal range.

The cause: warm air and ocean temperatures from the high pressure system responsible for California's mildest, driest and warmest winter on record. This unusual weather has resulted in a lack of ocean

number of sea lions born on the island in 2014.

2. High elephant seal pup mortality due to warmer air temperatures – Elephant seals just completed their winter breeding season. Pup survival was low this year, partly because of unusually warm air temperatures. Many pups died when overheating mothers led them to a cliff edge in attempts to get cool; pups then fell to their deaths.
3. Low attendance of breeding seabirds – Farallon nesting seabirds usually visit the islands during winter, but this year winter attendance was unusually low. In fact, the Cassin's Auklet, a bird observed to have suffered a large die-off from California to British Columbia this past fall and winter

of food, has been largely absent from the islands in the last few months, suggesting auklets have to search for food far from the islands. Since auklets feed mainly on krill, their activity and nesting success are good indicators

of the availability of this food resource, which is very important for many marine predators, including whales and salmon.

## Observations of marine animals occurring out of their range include:

1. Tristram's Storm-Petrel, 3<sup>rd</sup> observation ever for all of North America. On March 18, a freshly killed Tristram's Storm-Petrel was discovered on the islands, most likely the victim of a Burrowing Owl. This tropical seabird species typically occurs in the central and western Pacific Ocean, where it breeds on the northwest Hawaiian Islands and islands off southern Japan. This was only the 3<sup>rd</sup> record of the species in North America, the first of which was captured alive (and released) on the Farallon Islands in 2006.
2. Overwintering Brown Boobies. These tropical seabirds, commonly found in Mexico and Central America, are typically very rare in California, where they are mostly seen in summer and fall. But

unprecedented numbers have been at the islands all winter, with counts up to 12 birds. The previous record count at the Farallones was three birds in Fall 2006.

Climate change is clearly a factor in some, if not all of these unusual occurrences, but it will take ongoing monitoring and time to fully understand the connection. The high elephant seal pup mortality, for example, can be attributed to the unusually high air temperature, together with the decline of sand at the elephant seal breeding colony—a result of ongoing erosion from increased storm surges, itself a likely impact of climate change. Elephant seals use sand to keep themselves cool while on land; a lack of sand, combined with high air temperatures, produce conditions that make it difficult for the young to survive.

"It will take several years to see if these unusual wildlife patterns hold," says Gerry McChesney, Farallon National Wildlife Refuge Manager for the U.S. Fish and Wildlife Service. "If they do, it can probably be said that climate change is a major driving force."

Observations such as those on the Farallon Islands help researchers understand the effects of changing weather patterns and predict their effects on other ocean resources—such as fisheries, which are critical to the survival of seabirds and marine mammals and an important food source for humans.

"These unusual observations highlight the importance of monitoring our coastal wildlife," says McChesney. "They are significant indicators of ocean health, and help us understand and protect valuable coastal resources."

The Farallon National Wildlife Refuge is located about 30 miles west of San Francisco. Since 1968 Point Blue has monitored wildlife populations and environmental change on the islands daily, working in close collaboration with the Service, which manages the refuge. The Farallones host the largest seabird nesting colony in the contiguous U.S., as well as rookeries of seals and sea lions. Point Blue's long-term research on the Farallon Islands has helped monitor the refuge's valuable natural resources and California's highly productive marine ecosystem.

*Melissa Pitkin is the Director of Education and Outreach for Point Blue Conservation Science.*

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



*Elephant Seal. Photo: Sophic Webb*

upwelling, the process that brings nutrient rich waters from the bottom of the ocean to the surface. When upwelling is disrupted, the ocean food web is thrown out of balance – and the result is less food for marine wildlife, which disrupts their ability to breed successfully.

"The reasons for these rare observations have to do with the unusually warm air and ocean temperatures and how they impact the ecosystem," says Russ Bradley, Farallon Researcher for Point Blue Conservation Science. "In February, average air temperature and average sea surface temperature were the highest recorded in 45 years."

## Observations of disrupted breeding activities include:

1. California sea lions aborting pups due to poor body condition of the mothers. Since January 9<sup>th</sup>, 94 aborted sea lion fetuses have been recorded on the islands. Ninety-four is almost half the total



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genie\_moore@fws.gov





# Rebirth of an Estuary

*By Don Brubaker, Manager of San Pablo Bay, Marin Islands, and Antioch Dunes National Wildlife Refuges*

The area north of San Pablo Bay was once a vast estuary 125 years ago. This expanse where fresh water from rivers, streams, and creeks mixes with ocean water creates a highly productive and rich habitat that serves as nurseries for fish, crustaceans, and mollusks. Wading birds, ducks, and shorebirds intermingled with grizzly bears, elk, and deer as they took advantage of this abundant food source. Surrounded by the foothills of the Sonoma, Huichica, and the Vaca Mountains, the estuary encompassed more than 25% of the estuarine habitat found in the entire San Francisco Bay.

Fast forward to 2014 and you see an

extremely different landscape from the one just described.

The flat, estuarine land was perceived to be ideal for farming hay to feed the cattle and horses that man had become dependent upon. To prepare the site for farming, Chinese laborers, which were later replaced by steam and fossil-fuel powered dredge machines, cordoned large wetland parcels with levees to protect it from flooding from the tides. Once surrounded by levees, the parcels were crisscrossed with drainage ditches to pump the habitat dry, forming an island. This island currently known as Cullinan Ranch was referred to as “Island Number 1” in maps because it was the first area to be “reclaimed” into farmland within the estuary.

The 1,500-acre ranch saw decades of hay farming by various owners with the Cullinan family being the last hay farmers. Over the years, other owners came and went with some envisioning a major development which included hundreds of waterfront homes with a marina nearby. However, in the late 1980s, a small group of people championed the idea that the land should be returned back to an estuary. The idea grew and became a reality when Land and Water Conservation Funds and other contributors assembled enough money to purchase Cullinan Ranch to be added to the San Pablo Bay National Wildlife Refuge. The year was 1991.

For several years, the land lay idle. The levees were still intact. Although farming had ceased, Cullinan Ranch had morphed into habitat comprised of coyote bush, grasses, invasive eucalyptus trees and assorted other plants more consistent with uplands habitat. Efforts were finally underway to restore Cullinan Ranch back to estuary in the early 2000s. In the most ideal situation, tidal marsh habitat can be restored simply by breaching the levees and letting the tides occur naturally. The tides would bring in sediment, raising the marsh plain high enough so that marsh vegetation can establish naturally.

But, a lot has changed over the last 125 years. When the land was drained for farming, the soil dried up and subsided, essentially shrinking downward similar to a dried sponge. Cullinan Ranch is currently six to seven feet below sea level. Studies on the hydrology of the current conditions dictated where the levee should be breached and how wide they should be. If tides were allowed in unmeted, the water would scour channels into the land and approach velocities that would flood and damage adjacent property including State Route 37.

Unfortunately, flooding the area does not reconstitute the “dried sponge.” The soil has lost that ability through decay. To bring the land back to sea level and to reestablish marsh plants, islands were constructed to assist with sedimentation accretion. It is projected that in 60 years, the sediment will build up enough where vegetation such as pickleweed will take hold and an estuary is reborn.



*Levee breached in January 2015. Photo: Anne Morkill/USFWS*



*Photo: Aric Crabb/Bay Area News Group*

# Now that you've seen the exhibit at the Environmental Education Center, join in on the movement!

Litterati was created by Jeff Kirschner after his family went for a walk in the Oakland hills and encountered a plastic tub of kitty litter dumped in a stream. His four-year-old daughter—baffled by what she saw—exclaimed, “Daddy, that doesn’t go there!” which prompted Jeff to think more deeply about what he could do to leave a more environmentally stable planet for his children. Drawing on his background in start-up technology, Kirschner envisioned a way to engage and inspire individuals to take action whenever they could, wherever they were.

Since April, the Environmental Education Center has been hosting an exhibit displaying photographs the public have taken of litter. The exhibit will be on display until June.

The goal is also to stop litter before it starts, and photographs of cigarette butts and fast food containers are a stark reminder of the need for new strategies for reaching the public who still casually discard such items. Through keyword tags, the project also documents the products and brands that generate the most litter, enabling Litterati to take a data-driven approach towards smarter solutions. As Jeff says, “Individually, one can make a difference. Together, we can create an impact.”

The Don Edwards San Francisco Bay National Wildlife Refuge is asking for your help to keep your national wildlife refuge free of litter and to help document where and what is being thrown on our lands.

## Here's what you can do to help:

1. Create an Instagram account on your smart phone
2. If you see trash on the trail, take a photo of it and upload it to Instagram. Tag the photo(s) #Litterati #DonEdwardsRefuge #Name or type of trash, i.e. cigarette butt.
3. Pick up the litter and throw it away at the nearest trash receptacle.

Data compiled will help spot trends of where trash is accumulating and what is being thrown. By identifying these trends, we can create a targeted campaign on preventing litter from reaching our wild places and harming wildlife.

For information about Litterati, go to <http://www.litterati.org>

For more information about Don Edwards Refuge Litterati movement, email [Carmen\\_leong-minch@fws.gov](mailto:Carmen_leong-minch@fws.gov).



*Courtesy of Litterati.org*

## Volunteer Opportunities: Summer 2015

### Don Edwards San Francisco Bay National Wildlife Refuge Environmental Education Center (Alviso, California)

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

### Upcoming Volunteer Orientations for Summer

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

Saturday, June 13

Tuesday, July 7

Tuesday, August 18

Tuesday, June 23

Sunday, July 19

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

# 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, 2015 and March 31, 2015. 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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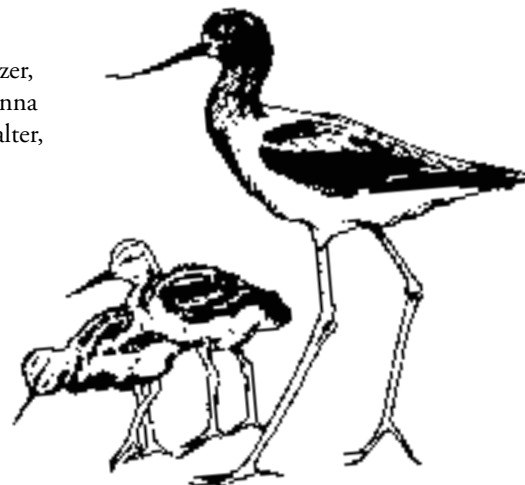
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## Help Us Help the Refuge

**Mail your donation to: San Francisco Bay Wildlife Society, P.O. Box 234, Newark, CA 94560.**

**You may also become a member at [www.sfbws.com](http://www.sfbws.com).**

San Francisco Bay Wildlife Society is a not-for-profit 501(c)(3) organization which raises money and awareness for the San Francisco Bay National Wildlife Refuge Complex.

**YES!** I want to support San Francisco Bay Wildlife Society and its programs with my membership. My dues include a subscription to *Tideline*. Enclosed is my contribution of:

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

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***Thank you for your support!***



# San Francisco Bay Wildlife Society Quarterly Message and Highlights

## Nature Store Updates:

As reported in the Spring *Tideline*, the San Francisco Bay Wildlife Society (SFBWS) bookstores had gone on hiatus while we developed processes consistent with the new Friends relationship that we are entering into with the San Francisco Bay National Wildlife Refuge Complex. I am happy to report that we will be opening up Nature Stores before the end of June at both the Environment Education Center and the Fremont Visitor Center. Staffed by SFBWS volunteers, these Nature Stores will open on weekends. We hope to expand this operation as we recruit more volunteers and as public demand warrants more hours of operation.

## Environmental Education and Interpretive Program Updates:

The Living Wetlands program wrapped up their spring schedule with many weekend interpretive programs (e.g., Tiny Drifters, Marshland Homes) and 10 integrated fields trips for 505 participants. Watershed Watchers programs included Girl Scouts World Thinking Day, Junior Refuge Rangers, Webelos Badges, and Saving the Monarchs.



## In other news:

Some new programs will be helping to raise environmental consciousness in the public. The Litterati Art Exhibit: Using Technology to Clean the Planet will connect photographs with real-life litter. Learn more by visiting the exhibit at the EEC this summer; exhibit is open until June.

Meanwhile, we continue to pursue grants for specific projects, to gain more corporate support and individual donations for expanding these programs and to reach more of the public sharing the importance of our National Wildlife Refuges for our communities.

We welcome your inputs. Send your thoughts to [Ceal.Craig@SFBWS.com](mailto:Ceal.Craig@SFBWS.com)  
Cecilia (Ceal) D. Craig, PhD  
President, SFBWS Board of Directors

## Connections to Pier Fishing



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

**Saturday, June 13**

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

Space is limited to 50 people.

All equipment will be provided. Please come on time.

To register, go to

<http://donedwardsfishing.eventbrite.com>

or call 510-792-0222 ext. 476.

For more information, see page 10.

# Summer Activity Schedule

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

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

## June

### Saturday, June 6



#### \*Nature Walk for Health

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

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

#### Why Tides Matter

Environmental Education Center, Alviso  
11:00 a.m. -12:00 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. Register at <http://wtmeec.eventbrite.com>.

### Sunday, June 7

#### Insect Exploration

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

Insects have been on this earth for hundreds of millions of years. Come learn about the many different insects that call the San Francisco Bay Area their home. We will examine insects and learn how they've adapted to survive. Join us as we dig in the dirt and crawl through the plants in search for our six-legged friends. Be prepared to get dirty. Open to all ages but best suited for ages 5 and up. Register at <http://eecinsectexploration.eventbrite.com>

#### Story Hunters

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

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

### Saturday, June 13

#### Connections to Pier Fishing

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

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

#### Crafts in the Outdoors: Beginning Leatherwork

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

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

#### Twilight Marsh Walk

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

Experience the salt marsh at twilight on an easy stroll along Tidelands (1.3 mile) Trail. At the setting of the sun we will observe the beginning of nature's night shift. Come discover the sights, sounds, and smells of the refuge as night descends. Not suitable for young children. Register at <http://donedwardstwillight.eventbrite.com> or call 510-792-0222 ext. 362.

### Sunday, June 14

#### Nature Yoga

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

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

#### Geology Walk of the Don Edwards Refuge

Visitor Center, Fremont  
1:00 p.m. – 2:00 p.m.

Ever wonder what the dirt on the trail is made of, what the rocks are by the shore, and how wetlands are created? Join Jose Garcia at the refuge as he deconstructs the area around you and explains how geology influences the landscape. Discover how

knowledge of geology helps rebuild wildlife habitat and provides flood protection for us all. Cameras welcome. Trail is 1.3 miles and family friendly call 510-792-0222 ext. 141 for more information. Register at <http://hqgeo.eventbrite.com>.

### Saturday, June 20

#### Habitat Under Construction

Environmental Education Center, Alviso  
10:00 a.m. – 11:30 a.m.

Come take a van ride to see how the salt ponds are transforming and creating new habitat. You will see varying stages of habitat under construction and how the wildlife is returning. A short orientation and discussion will be held in the auditorium prior to the pond tour. Bring a camera and binoculars for better viewing. Space is limited. Register at <http://huceec.eventbrite.com>. or call 510-792-0222 ext. 362. Led by George Trevino.

#### \*Marshlands of Dreams

Visitor Center, Fremont  
11:00 a.m. – 12:00 p.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.

#### \*Family Bird Walk

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

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Go to <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

#### \*Night Sky Party!

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

Meet the stars of summer! Join our amateur astronomers as we learn about constellations. Make a star chart and then venture outside to view the night sky through a telescope. Afterwards, warm up with some hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly as it gets cold in the evening. Fun for the whole family. RESERVATIONS REQUIRED. Go to: <https://skypartyeec.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

### Saturday, June 21

#### \*Father's Day Wetlands Tour

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

Our refuge consists of salt marshes, salt ponds, and tidal and non-tidal sloughs. How do humans and wildlife depend on our wetlands? Come enjoy a slideshow depicting the life and death struggles of our marsh inhabitants followed by a 0.5 mile walk through the wetlands. Open to all ages but best suited for ages 7 and up. Register at <http://eecwetlandswalkingtour.eventbrite.com>



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**Sunday, June 28**

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### **Bay Bike Ride**

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

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

# July

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**Saturday, July 11**

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### **\*Habitat Exploration**

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

Join us as we explore the five refuge habitats. We will look for various types of wildlife including insects, spiders and reptiles. With the summer season in progress we will discover how the change in season affects refuge plants and animals. Open to all ages but best suited for ages 7 and up. RESERVATIONS REQUIRED. Go to: <http://exploreeec.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

### **Going Green, the Restoration of the South Bay Salt Ponds**

**Environmental Education Center, Alviso  
10:00 a.m. – 11:00 a.m.**

Join an interpretive walk to photograph the wildlife and wetlands in the South Bay Salt Pond Restoration Project. Knowing the area will both increase your appreciation for the baylands and the ability to see them in whole new way. Discover plants and animals in its habitat and the best time to see them. Cameras welcome. Led by Joseph Garcia. Call 510-792-0222 ext. 141 or register at <http://sbspp.eventbrite.com>.

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

**Visitor Center, Fremont  
2:00 p.m. – 4:00 p.m.**

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Go to <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

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**Sunday, July 12**

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### **\*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.

### **Bay Bike Ride**

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

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

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**Saturday, July 18**

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### **Community Service**

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

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

### **Bike the Levees**

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

Join Ed Kantack for an easy 5-6 mile bike ride along the levees. Come experience one of the largest tidal wetland restoration projects on the west coast! The levees are dirt so knobby tires are recommended. Open to all ages. RESERVATIONS REQUIRED. Go to <http://bikeeeec.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

### **Habitat Under Construction**

**– Alviso Salt Ponds**

**Environmental Education Center, Alviso  
10:00 a.m. – 11:30 a.m.**

Come take a van ride to see how the salt ponds are transforming and creating new habitat. You will see varying stages of habitat under construction and how the wildlife is returning. A short orientation and discussion will be held in the auditorium prior to the pond tour. Bring a camera and binoculars for better viewing. Space is limited. Register at <http://huc2eec.eventbrite.com>. or call 510-792-0222 ext. 362. Led by George Trevino.

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**Sunday, July 19**

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### **History of the National Wildlife Refuge System**

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

Before heading out on your walk, learn about the national wildlife refuge system in this short talk given by Art Garibaldi. What makes a national wildlife refuge different than a park? Hear why and how the refuge system was created.

### **\*Water is Wonderful**

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

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

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**Saturday, July 25**

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### **Cullinan Ranch Walk**

**10:00 a.m. - 11:00 a.m.  
Cullinan Ranch Unit, San Pablo Bay NWR**

Take a nature trail walk with Park Ranger Jose Garcia and learn about the Cullinan Ranch Unit at San Pablo Bay National Wildlife Refuge. Enjoy the abundant wildlife, and beautiful scenery. Camera's welcome. REGISTRATION REQUIRED. Go to <http://cullinanspb.eventbrite.com> or call 510-792-0222 ext. 141 for driving directions.

### **Drawbridge Van Excursion**

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

An abandoned town in the San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or people scrabbling out a living? How long did it exist? Find out at this program led by Ceal Craig. We will start with a slideshow, and then take a short van excursion to view Drawbridge across Coyote Creek. Program will be of most interest to adults interested in history or nature; children 13 and over with an adult are welcome. Space is very limited. RESERVATIONS REQUIRED. Go to <http://van1.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext. 104. (Note: we do not visit the town itself – we go to the closest spot that one can legally view Drawbridge.)

### **A Trip Back in Time**

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

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

### **Are Dinosaurs Still Alive?**

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

Visit us at the EEC to compare birds with their ancient ancestors: DINOSAURS! Learn about dinosaur and bird migration, behavior, and body structures. Program is geared toward rising 3rd and 5th graders. Space is limited. Questions? Email [eec.refuge@hotmail.com](mailto:eec.refuge@hotmail.com). RESERVATIONS REQUIRED. Go to <http://eecdino.eventbrite.com>.

# Summer Activity Schedule

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

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

## 5 Tools You Can Use to Find the Elusive Gray Fox

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

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

## Twilight Marsh Walk

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

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

## Sunday, July 26

### Nature Yoga

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

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

### Returning the Tide at San Pablo Bay NWR

Cullinan Ranch Trail, San Pablo Bay NWR  
3:00 p.m. – 4:30 p.m.

After 125 years, the Cullinan Ranch Unit of San Pablo Bay National Wildlife Refuge is now receiving tidal flow from the bay. After a short talk about what the refuge hopes to accomplish with the restoration,

we will take a walk to view the site. Led by Carmen Minch. Register at <http://www.returningtide.eventbrite.com>. The trailhead can only be accessed from westbound State Route 37. Head westbound on SR 37. Just after passing Walnut Avenue at Mare Island, travel 3.3 miles to the Cullinan Ranch turn-off where a large wooden kiosk is located. There is a small parking lot. If coming from the west, you must drive past the trailhead 3.3 miles. Exit at Walnut Ave, turn around and head west on SR 37.

## August

### Saturday, August 1

#### \*Nature Walk for Health

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



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

#### Fossils and Flumes

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

Fossils and flumes help teach children about the South Bay Salt Pond Restoration Project. Park Ranger Jose Garcia brings fossils from Triassic wetlands he collected in eastern Montana to show the similarities to wetlands today. We'll learn what their function is in nature. Interactive flumes allow for a hands-on experience of how wetlands protect the surrounding area from flooding. Register at <http://fofleec.eventbrite.com> or call 510-792-0222 ext. 141.

#### Beginning Bird Drawing for Families and Adults

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

Learn how to draw birds. Increase your confidence in drawing and learn skills to help you draw what you see. We will have a variety of mounted birds available for drawing and for observing bird anatomy. We will practice techniques for making life-like bird drawings and for getting the proportions right. Appropriate for ages 8 to adult. Children, please bring an adult with you who would like to participate. Adults without children are also welcome. Bring a sketch pad and pencil or use ours. All skill levels welcome. RESERVATIONS REQUIRED. Go to: <http://begbirdeec.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext. 104.

#### Intermediate Bird Drawing

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

Learn techniques to help your bird drawings come to life. This class will be a continuation of the morning class or can be taken independently. The morning class emphasized quick sketches, basic shapes, and bird anatomy. This class will provide additional instruction, an opportunity for more careful study of the bird models, and time to do longer drawings. Appropriate for ages 8 to adult. Children, please bring an adult with you who would like to participate. Adults without children are also welcome. Bring a sketch pad and pencil or use ours. All

skill levels welcome. RESERVATIONS REQUIRED. Go to: <http://interbird.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

## Sunday, August 2

### \*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 and view the most ancient creatures on earth. See how they produce the oxygen we breathe and take up the carbon dioxide we produce. Easy short hiking level. Ages 9-90 years. Register at <http://donedwardslife.eventbrite.com> or call 510-792-0222 ext. 362.

## Saturday, August 8

### \*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.

### Drawbridge Van Excursion

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

An abandoned town in the San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or people scrabbling out a living? How long did it exist? Find out at this program led by Ceal Craig, our Drawbridge expert. We will start with a slideshow, and then take a short van excursion to view Drawbridge across Coyote Creek. Program will be of most interest to adults interested in history or nature; children 13 and over with an adult are welcome. Space is very limited. RESERVATIONS REQUIRED. Go to: <http://van2.eventbrite.com>. Questions? Call Julie at 408-262-5513 ext.104.

### Docent Training

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

Want to become a volunteer or update your training? Come to a Salt Pond Restoration Docent Volunteer Training class where Park Ranger Joseph Garcia will teach you the volunteer process and what new changes are taking place within the refuge. Register at <http://spdocent.eventbrite.com> or call 510-792-0222 ext. 141.

### \*JR Refuge Ranger Program - Alviso

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

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



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## Sunday, August 9

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### Nature Yoga

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

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

### Bay Bike Ride

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

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

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## Saturday, August 15

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### Community Service

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

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

### Habitat Under Construction – Alviso Salt Ponds

Environmental Education Center, Alviso  
10:00 a.m. – 11:30 a.m.

Come take a van ride to see how the salt ponds are transforming and creating new habitat. You will see varying stages of habitat under construction and how the wildlife is returning. A short orientation and discussion will be held in the auditorium prior to the pond tour. Bring a camera and binoculars for better viewing. Space is limited. Call 510-792-0222 ext. 362. Led by George Trevino.

### A Trip Back in Time

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

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

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## Twilight Marsh Walk

Visitor Center, Fremont  
7:00 p.m. – 8:45 p.m.

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

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## Sunday, August 16

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### Insect Exploration

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

Insects have been on this earth for hundreds of millions of years. Come learn about the many different insects that call the San Francisco Bay Area their home. We will examine insects and learn how they've adapted to survive. Join us as we dig in the dirt and crawl through the plants, in search for our six-legged friends. Be prepared to get dirty. Open to all ages but best suited for ages 5 and up. <http://eeinsectexploration.eventbrite.com>.

### Story Hunters

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

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

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## Saturday, August 22

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### Hike the Mallard Slough Trail

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

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

### Everybody Needs Somebody

Environmental Education Center, Alviso  
10:00 a.m. - 11:00 a.m.

Plants, animals, and microscopic organisms depend on each other. Learn how the inhabitants of an ecosystem are connected for the survival of individuals and of an entire species. Program will be indoors with group activities. Best suited for ages 7 and up.

### \*Family Bird Walk

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

Let family walks become a shared time of nature learning. We'll begin by helping kids create their personal bird watching field guides, and then head out onto the trails to find those birds. A limited number of binoculars are available to borrow. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Go to <https://donedwardsfamilybird.eventbrite.com> or call 510-792-0222 ext. 362.

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## Sunday, August 23

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### \*Tiny Drifters

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

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

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## Saturday, August 29

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### Alviso Slough Cleanup

Alviso Marina through the Alviso Slough  
1:00 p.m. – 4:00 p.m.

Love to kayak? Love to clean up the environment? Why not combine the two and partner with Slough Keepers as they clean up Alviso Slough. Bring a kayak to the upper lot's launch ramp at the Alviso Marina and be prepared to paddle through the slough and some reeds. Due to the reeds, this is recommended for those who have some kayaking experience. Slough Keepers will provide garbage bags and some garbage barges. To sign up, contact Eric Norris at [sloughkeepers@gmail.com](mailto:sloughkeepers@gmail.com) and visit [www.sloughkeepers.org](http://www.sloughkeepers.org) for more information. Space is limited to 25 kayakers. MORE DATES available at <http://sloughkeepers.com/joining-sloughkeepers>

### Jr. Refuge Ranger Program - Fremont

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

Be an honorary Jr. Refuge Ranger by completing activities on the refuge. We will guide you in some of the activities that will help you earn the Refuge Ranger Badge. The rest of the activities can be completed on your own. Those who complete the activities in the booklet for your age group will receive a Jr. Refuge Ranger button. Register at <http://fremonstranger.eventbrite.com> or call 510-792-0222 ext. 362.

### 5 Tools You Can Use to Find the Elusive Gray Fox

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

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

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## Sunday, August 30

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### History of the National Wildlife Refuge System

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

Before heading out on your walk, learn about the national wildlife refuge system in this short talk given by Art Garibaldi. What makes a national wildlife refuge different than a park? Hear why and how the refuge system was created.

# 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 and Restoration Education programs are offered at our Headquarters in Fremont, and Wetland Round-Up and Living Wetlands are offered at the Environmental Education Center in Alviso. These programs actively involve teachers, adult volunteers, and students in investigating the diverse habitats and wildlife at the refuge. The hands-on, small-group activities are designed to teach basic ecological concepts and to introduce endangered species, migratory birds, and wetland habitats to the students. *All programs have been correlated to the appropriate State of California Education Standards.*

Educators and adult leaders conduct their own field trips after attending a Field Trip Workshop. The workshops allow you to design and conduct your own field trip. In addition, adult volunteers must be recruited to lead the activities at the different learning stations and to chaperone the rotation groups of students.

We provide easy to follow “scripts” for each station, but both “leaders” and “chaperones” are strongly encouraged to attend a Field Trip Workshop. New teachers must attend a Field Trip Workshop. Location of activities and trail conditions may vary. Please call for accessibility information.

## Field Trips at the Learning Center in Fremont

Information about Fall field trips will be posted on our website at the end of August. Visit [http://www.fws.gov/refuge/Don\\_Edwards\\_San\\_Francisco\\_Bay/Field\\_trip\\_Programs.html](http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/Field_trip_Programs.html)

**Contact the Environmental Education Staff at Fremont:**

**Office: 510-792-0222 ext. 475 Cell: 510-377-7269**

**E-mail: [ee.hq.intern@gmail.com](mailto:ee.hq.intern@gmail.com)**

## Field Trips at the Environmental Education Center in Alviso

**Wetland Round-Up Field Trips** - Investigate the butterflies in the butterfly garden, taste pickleweed in the salt marsh, or discover the creatures that live in the slough water on a Wetland Round-Up Field Trip. This field trip program is designed for up to 65 students in grades K-6. Information about Fall field trips will be posted on our website at the end of August. Visit [http://www.fws.gov/refuge/Don\\_Edwards\\_San\\_Francisco\\_Bay/Field\\_trip\\_Programs.html](http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/Field_trip_Programs.html) Our field trip program is fully booked for spring.

**Contact the Environmental Education Staff in Alviso:**

**Office: 408-262-5513 ext. 100**

**E-mail: [genie\\_moore@fws.gov](mailto:genie_moore@fws.gov)**

**Fall 2015 field trip dates will be posted on-line at the end of August 2015.**

## Living Wetlands Education Program

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

### Living Wetlands Program Offerings:

**Integrated Field Trip Program (5th – 12th grades):** 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 include hands-on activities and demonstrations. For the Integrated Program, participating classes must be from the following cities: San Jose, Alviso, Milpitas, Santa Clara, Saratoga, Monte Sereno, Los Gatos, Campbell, and Cupertino. There is a limitation to 60 students per field trip, and a 1:10 chaperone to student ratio is required.

**Classroom Presentations (5th – 12th grades):** 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.

**Field Trip and Guided Tours for other Schools, Colleges, Universities, and related organizations:** General presentations and guided tours are available and are generally 1.5 hours in length.

Educators are encouraged to contact us to discuss options for customizing field trips and classroom presentations. Reservations for the Living Wetlands program are on a first-come basis. **Call Aja Yee, the Living Wetlands Program Coordinator at 408-262-5513 ext. 102 or email at [livingwetlands@sfbws.com](mailto:livingwetlands@sfbws.com) for more information.**





# Scout and Youth Group Programs

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

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

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

The Environmental Education Center offers three types of youth programs which are listed below. Email [julie.kahrnoff@sfbws.com](mailto:julie.kahrnoff@sfbws.com) to schedule a date, and to customize your visit. *Note: Ratio of 1 adult per 5 children maximum. Space is limited to 20 people,*

*including siblings.* Once the program is full there will be a waiting list.

### \*Webelos Naturalist Badge

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

### Daisies Journeys

#### Environmental Education Center, Alviso

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

### Brownies Journeys and Badges

#### Environmental Education Center, Alviso

Journeys: *WOW! Watching our Water:* Without water, we cannot exist. Can you return the favor? On this journey, take action by discovering how to love water, save water, and share water. Badges: (from WOW badge activity set): *Household Elf:* make a natural cleaner, water log on ways to save water, trash clean up, discover natural filters. *Hiker:* go over trail map, leave no trace, detective hike with birds.

### Juniors Journeys and Badges

#### Environmental Education Center, Alviso

Journeys: *Get Moving!* Are you prepared to use your energy to save the planet? On this Journey, find out how to reduce your energy use, make buildings energy efficient, and create a plan to fix

an energy problem in your community. Badges (from Get Moving badge activity set): *Gardner:* outdoor garden, native plant garden design, seasonal plants, seeds and soil, plant own native plant to take home. Badges (from aMUSE badge activity set): *Animal Habitats:* puppet show, explore 5 different habitats, make bird house, learn about endangered wetlands and animals, help clean up.

### Cadet Journeys

#### Environmental Education Center, Alviso

Breath (Sessions 1 & 3)

## Youth Group Programs at the Refuge Headquarters in Fremont

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

### Webelos Naturalist Program

**Sunday, June 28**

**Sunday, July 19**

**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.

## TIDELINE

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Editor: ..... Carmen Minch

To receive *Tideline*, email [carmen\\_leong-minch@fws.gov](mailto:carmen_leong-minch@fws.gov), or write to: *Tideline*, San Francisco Bay National Wildlife Refuge Complex, 1 Marshlands Rd, Fremont, CA 94555

## San Francisco Bay National Wildlife Refuge Complex

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

Project Leader: ..... Anne Morkill  
 Deputy Project Leader: ..... Chris Barr  
 Wildlife Refuge Specialist: ..... Anna Fisher  
 Don Edwards Warm Springs Unit Manager: ..... Ivette Loreda  
 Farallon Refuge Manager: ..... Gerry McChesney  
 Farallon Wildlife Specialist: ..... Jonathon Shore  
 North Bay Refuges Manager: ..... Don Brubaker  
 North Bay Wildlife Specialists: ..... Melisa Amato and Louis Terrazas  
 South Bay Refuges Manager: ..... Diane Kodama  
 Public Affairs Officer: ..... Doug Cordell  
 Refuge Planner: ..... Winnie Chan  
 Chief of Visitor Services: ..... Jennifer Heroux  
 Park Ranger/Outdoor Recreation Planners: ..... Joseph Garcia and Carmen Minch  
 Environmental Education Specialists: ..... Tia Glagolev and Genie Moore  
 Volunteer Coordinator: ..... Paul Mueller

Law Enforcement Officers: ..... Jared Klein, Jesse Navarro and Chris Wilson  
 Biologists: ..... Joy Albertson, Christopher Caris, Susan Euing, Allison Fuller, Meg Marriott, Cheryl Strong, and Rachel Tertes

Administrative Staff: ..... Lucinda Ballard and Ellen Tong

Maintenance Staff: ..... Juan Flores, James Griffin, Calvin Sahara, Michael Springman, and Ed Van Til

### San Francisco Bay Wildlife Society

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

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**Tideline is On-Line** Visit our web sites at

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SUMMER 2015  
Volume 38, Number 2

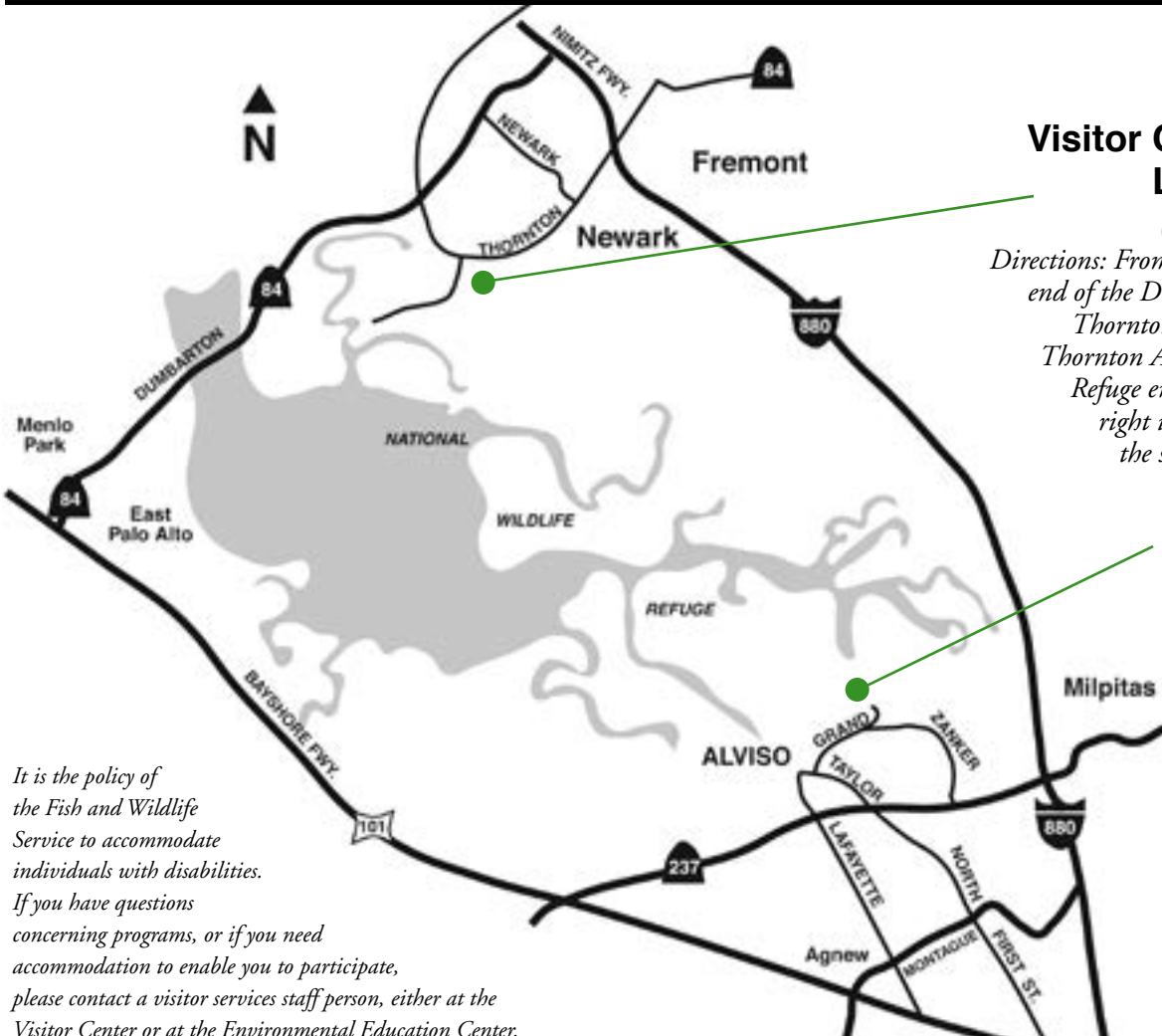


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# Tideline

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



### Visitor Center, Fremont Learning Center

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

### Environmental Education Center, Alviso

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

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