

Tideline



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

The Double-crested Cormorant: Bad Rap for this Local Come-back Kid

By Cheryl Davis

If you have crossed San Francisco Bay either by boat or car, you've likely seen these large, black aquatic birds either floating low in the water, flying overhead with a distinctive crooked neck, or resting on rocks or electrical towers with wings outstretched like Count Dracula's cape, drying their feathers. Given their visibility today, it's hard to believe populations of this nationally ubiquitous species, the Double-crested Cormorant (*Phalacrocorax auritus*), were once devastated by the pesticide DDT and PCBs (polychlorinated biphenyls). Banning of these chemicals during the 1970s resulted in a very successful recovery story.

Though there are other cormorant species present in San Francisco Bay and along the California coast, the Double-crested Cormorant is the only one associated with inland fresh, brackish and saline waters; all other cormorant species are saline species. Double-crested Cormorants are large birds, measuring as long as 32 inches. They have orange-yellow skin on the face and neck and bright turquoise eyes. For most of the year males and females sport a dull, grey-black plumage. However, during the breeding season, depending on the angle of the light, breeding adults can appear iridescent green, brown, bronze, and purple. Breeding birds have large white plumes above their eyes, but the "double-crested" designation comes from the short black plumes which also appear above the eyes during this time.

Other water birds have a natural waterproofing on their feathers and an oil gland at the base of the tail to oil their feathers. While the Double-crested Cormorant lacks the waterproofing common to some water species, it does have the oil, or uropygeal (sounds like your-o-pi-geal) gland at the base of its tail and is able to oil its feathers. But the lack of initial waterproofing is the reason they are often seen at rest with outstretched wings. Experts note that the value of drying is not entirely clear as it has been documented that wet wings do not compromise flight significantly.

Double-crested Cormorants are migratory species with distributions on the east coast, west coast, and inland areas in North America. Migration is highly variable but nesting colonies in the interior of the United States probably winter along the coast in California and Mexico. They usually migrate in a loosely v-shaped formation high in the sky. Like many aquatic bird species, Bay Area populations are year-round residents due to the mild climate.

Cormorants are predominately piscivorous or fish eating but they occasionally dine on some invertebrate species as well. Ample



Cormorant

Photo: Greg Aronson

research of the diets of cormorants has concluded they are attracted by high densities of fish, schooling fish and slower moving fish. They feed in fairly shallow water along the shore, using their large webbed feet to propel them after prey. Opportunistic in their choices, they have been documented to feed on 250 different species of fish from

continued next page

60 different families. From 1800-1940, Bay Area cormorants were associated with large schools of sardines. Human-caused depletion of this resource may have contributed to the initial decline of this species as well as DDT and PCBs. Today, herring, Midshipman, and anchovies are important food sources in the Bay.

Feeding requires effort as cormorants must dive and pursue fish. Most fish are consumed under water but the occasional larger fish may be brought to the surface, shaken or slapped on the water, flipped in the air and swallowed head first. Their distinctive hooked bills assist them in seizing prey as does their pelican-like distensible pouch.

old heron or egret nests and will renovate to suit their needs. The *Sibley Guide to Birds* describes their calls as a “hoarse bullfrog-like grunting” so the raucous created by large colonies of breeding or feeding cormorants can saturate the air.

An average clutch of eggs is four (most marine birds only produce one egg per clutch) and both males and females incubate the eggs, switching off every one to three hours. Incubating eggs are balanced on top of the feet as the parent settles its belly on top of the eggs. Unlike other sea birds, they rarely forage far from their nests and foraging and feeding is shared by both males and females. Nestlings can consume a whole fish within a few days which is

now considered an expensive nuisance. The intense populations of cormorants in the interior and eastern North America have come into conflict with humans primarily over aquaculture (fish farms or hatcheries). The predominant cormorant in these regions is a sub-species (*Phalacrocorax auritus auritus*) of the one found in the Bay Area. Feeding and breeding colonies can reach into the hundreds of thousands in Great Lakes and southern states. Large colonies of feeding birds, particularly in southeastern states with aquaculture, have led to this species being assigned such pejorative labels as “eating machines” and “plagues.” Indeed, aquaculture operations provide cormorants with a ready-to-serve fish dinner. The increased food supply of fish farms has led to increased survival rates of chicks in these states. Although cormorants behave instinctively to increase the survival of their species by taking advantage of a steady supply of fish, this sub-species was portrayed as a pest and detrimental to aquaculture operations. Depredation permits were issued by the US Fish and Wildlife Service in 1998 in attempts to control the birds to prevent depredation of public fish resources. Some dispute the veracity of such claims against the cormorants and monitoring of these species continues in these regions.

Back home this species’ story is quite different. In the early part of the 20th century it is estimated that most Double-crested Cormorants in the Bay Area nested on the Farallon Islands but foraged in San Francisco Bay. In the 1970s their nesting sites shifted toward the Bay. They adapted to nesting on power transmission towers, bridges and sometimes trees. Larger concentrations occur in the North Bay near Napa, the Central Bay at the Richmond and Oakland-Bay Bridges and near the Dumbarton Bridge in the South Bay. A 1991 study noted 2,800 birds nesting in 12 colonies.

Since Double-crested Cormorant populations along the California coast and Bay have not experienced the explosive growth of their eastern relatives, most complaints against this species for interfering with sports and recreational fishing have not resulted in any population control measures. This is fortunate as our Bay populations are



Cormorants on bridge

Photo: Cheryl Davis

Breeding season is generally April through August for the monogamous pairs. Communal nesting can be on cliffs, flat ground, trees, or man-made structures. Nest building, maintenance and chick rearing are partnership activities for males and females. Males gather and deliver sticks to the female who forms the nest and acts as a security guard against stick theft by other nesting cormorants. Nests are spruced up throughout the reproduction process and with multiple years of use, some nests can reach a height of six feet! Cormorants will also use

delivered via the adult lowering its mouth over the entire head of the offspring. Large nests are necessary because the chicks must remain near or in the nest until they can fly, approximately three to six weeks. Nestlings become completely independent in approximately 10 weeks.

As noted earlier, the banning of DDT and PCBs aided the recovery of Double-crested Cormorants. It was so successful that in the Great Lakes region and in some southern and southeastern states they are



Photo: Greg Aronson

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actually declining! Point Reyes Conservation Science recently released a disturbing study announcing that 2009 will be remembered as the “worst year for all Bay Area cormorants in memory.” According to PRBO, the number of breeding birds at the Bay Bridge colony dropped by 90%. Not since the organization started studying this species in 1989 has there been such a significant decline in numbers.

It has been hypothesized that low levels of anchovy in the Bay (the most abundant fish currently in the Bay) led to starvation of some birds this year. March winds may have led to over-mixing of marine nutrients which lead to prey disruption and some starvation, but previous human disturbance to fish resources and pollution could also be possible factors. There have been similar declines in other nesting seabirds such as Common Murre and Brandt’s Cormorant in the region this year. PRBO concludes: “This

is yet another signal from the seabirds of a stressed marine food web in our region.”

The initial recovery of the Double-crested Cormorant was deemed precedent setting, but human alteration of the natural environment has led to a “bad rap” for this adaptable species. More studies concerning this species are needed to understand the declining populations here in the Bay Area. Perhaps the nation could learn a lesson from the cormorant’s legacy, acknowledging our inclination to assign nuisance or even pestilence status to species whose only crime is resilience and adaptability.

Cheryl L. Davis is an Environmental Planner for the City of San Francisco and a Research Associate at California State University East Bay where she received her M.S. in Biology. Her thesis research identified two previously unrecorded aquatic snail species in restored marshes in southern Suisun Bay.

Former planning mantra: fill in the bay

The Bay Area has a sordid past in land use involving efforts to fill the bay for commercial and residential development. Most of the filling stopped, but not before thousands of acres of salt marsh that once encircled San Francisco and San Pablo Bays were converted to other uses. Fortunately, one of those uses was salt production, which left enormous areas relatively intact. Restoring these areas back to salt marsh is much easier than trying to restore wetlands that had been filled in. Salt evaporation ponds were created by dredging up bay mud which was used to form levees, separating the salt marsh from open bay water. In time, this isolation from the tides destroyed the salt marsh and the water was either used to produce salt through solar and wind evaporation or pumped out to create land for farming.

On the Don Edwards San Francisco Bay and San Pablo Bay National Wildlife Refuges, miles of these levees are now under our management. The 9,600-acre acquisition from Cargill in 2003 alone added approximately 70 miles of levees to the Don Edwards Refuge. Now part of the South Bay Salt Pond Restoration Project, some of these levees are being maintained to provide managed pond habitat for migra-

tory and resident wildlife, but the ultimate goal is restoration of the salt marsh and the abandonment of the levees.

Levees on both these refuges can extend, for miles in some cases, into both bays where they are exposed to winter storms. The most exposed levees often

A major emphasis of our levee management is to find ways to reduce the amount of fill we place in the bay. Sometimes, however, the levees create an additional dilemma because they can also be used for hiking and bicycling trails, providing a great way for the public to experience and seek



Refuge Reflections

by Mendel Stewart

require extensive repair-sometimes involving the placement of large rock called riprap to hold them in place.

On the Don Edwards Refuge the levees must remain in place until flood control levees are constructed along the South Bay shoreline. Once flood control is in place, most of the levees can be breached, allowing the eventual return of salt marsh. Until that time repair is done through placement of additional mud or by trucking in riprap. Either way the result is the same: the bay is continuing to be filled.

out the wildlife resources we manage and protect.

Balancing these public use opportunities with the desire to improve and restore wildlife habitats while at the same time stopping the filling of the bay is what we strive for. It’s not an easy job, but in this transitional phase in the life of the bay, it’s a critical one. Ultimately, we will be able to pull back to the shoreline and away from these levees giving both wildlife and the public a better view.

The Brown Pelican – Poised to be Delisted

US Fish and Wildlife Service

“A wonderful bird is the pelican; his bill can hold more than his belly can. . . .” So begins Dixon Lanier Merritt’s well-known limerick. It is not far from the truth. The pouch suspended from the lower half of the pelican’s long, straight bill really can hold up to three times more than the stomach.

In addition to being used as a dip net, the pouch holds the pelican’s catch of fish until the accompanying water—as much as three gallons—is squeezed out. During this time, laughing gulls may hover above the pelican, or even sit on its bill, ready to steal a fish or two. Once the water is out, the pelican swallows the fish and carries them in its esophagus. The pouch also serves as a cooling mechanism in hot weather and as a feeding trough for young pelicans.

The Brown Pelican is one of the Endangered Species Act great success stories. It has been proposed to be delisted from the Endangered Species list back in February of 2007 and public comments received



Photo: David Hall

in response to this proposal are currently undergoing review. In preparation for the possible delisting of the Brown Pelican, here is some interesting facts and information about this amazing bird.

The Brown Pelican inhabits the Atlantic, Pacific, and Gulf Coasts of North and South America. On the Atlantic Coast, the species can be found from Nova Scotia to Venezuela and on the Pacific Coast, from British Columbia to south-central Chile and the Galapagos Islands. Here in the San Francisco Bay Area, Brown Pelicans can often be seen foraging in the Bay and in some of the less saline salt ponds.

Measuring up to 54 inches long, weighing 8 to 10 pounds, and having a wingspan between 6-1/2 feet and 7-1/2 feet, Brown Pelicans are the smallest members of the

seven pelican species worldwide. They can be identified by their chestnut-and-white necks; white heads with pale yellow crowns; brown-streaked back, rump, and tail; blackish-brown belly; grayish bill and pouch; and black legs and feet.

Pelicans are long-lived birds. One pelican captured in Florida had been banded 31 years earlier! Pelicans are primarily fish-eaters, requiring up to four pounds of fish a day. On the Pacific Coast, pelicans rely heavily on anchovies and sardines. The birds have also been known to eat some crustaceans, usually prawns.

Brown Pelicans have extremely keen eyesight. As they fly over the ocean, sometimes at heights of 60 to 70 feet, they can spot a school of small fish or even a single fish. Diving steeply into the water, they may submerge completely or only partly—depending on the height of the dive—and come up with a mouthful of fish. Air sacs beneath their skin cushion the impact and help pelicans surface.

Pelicans are social and gregarious. Males and females and juveniles and adults congregate in large flocks for much of the year. Brown Pelicans typically begin to breed between the ages of three and five years. The birds nest in large colonies on the ground, in bushes, or in the tops of trees. On the ground, a nest may be a shallow depression lined with a few feathers and a rim of soil built up four to ten inches above ground, or it may be a large mound of soil and debris with a cavity in the top. A tree-top nest usually consists of reeds, grass, and straw heaped on a mound of sticks interwoven with the supporting tree branches.

The male delivers material to the female, who builds the nest. She typically lays two to three chalky white eggs that hatch in about a month. In most of the nesting range of the pelican in the United States peak egg-laying usually occurs in March through May.

Parents share in incubating the eggs and raising the young. Like many birds, newly hatched pelicans are blind, featherless, and altricial—that is, completely dependent upon their parents. They soon develop down that is soft and silky, followed by feathers. Average age at first flight is 75 days.

Brown Pelicans have few natural en-

emies. Although ground nests are sometimes destroyed by hurricanes, flooding, or other natural disasters, the biggest threat to pelicans comes from people. In the late 19th and early 20th centuries, pelicans were hunted for their feathers, which adorned women’s clothing, particularly hats. Several efforts in the early part of the 20th century were meant to curb the decline of Brown Pelicans. In 1903, President Theodore Roosevelt designated Florida’s Pelican Island as the first national wildlife refuge, a move that helped reduce the threat of plume hunters. Passage of the Migratory Bird Treaty Act in 1918 gave protection to pelicans and other birds and helped curb illegal killing.

With the advent and widespread use of pesticides such as DDT in the 1940s, pelican populations plummeted due to lack of breeding success. When pelicans ate fish contaminated with DDT, the eggs that they laid had shells so thin that they broke during incubation.

By the 1960s, Brown Pelicans had nearly disappeared along the Gulf Coast and experienced almost complete reproductive failure in southern California. Studies proving the pelicans were not harming commercial fisheries helped to stop their wholesale slaughter.

In 1972, the Environmental Protection Agency banned the use of DDT in the United States and restricted the use of other pesticides. Since then, there has been a decrease in the level of chemical contaminants in pelican eggs, and a corresponding increase in nesting success.

In 1985, Brown Pelicans in the eastern United States, including Alabama, all of Florida, Georgia, South Carolina and points northward along the Atlantic Coast, had recovered to the point that the populations were removed from the Endangered Species List. The U.S. Gulf Coast populations in Texas and Louisiana, although still listed as endangered, were recently estimated at nearly 12,000 breeding pairs. The Brown Pelican is also still listed as endangered in the Pacific Coast portion of its range. As a result of the ban on the use of DDT in the United States, as well as complementary conservation efforts, the species has made a strong comeback and, in view of its improved status, has been proposed to be “delisted” throughout its range. With an estimated 400,000 birds in Peru, the U. S. Fish and Wildlife Service estimates the global population at 650,000 brown pelicans.

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Free audio tours are available for download at www.yourwetlands.org

FRIENDS OF SAN PABLO BAY NATIONAL WILDLIFE REFUGE

Photo contest!



Friends of San Pablo Bay are seeking photographs that capture the beauty and spirit of San Pablo Bay Refuge.

Prize: A deluxe wine package from Viansa Winery
Deadline: February 1, 2010

Submit all entries to:
Friends.SPBNWR@gmail.com All entries must include your name, contact information, and where the photograph was taken.

All entries will be considered for publication on the internet, calendars, or postcards. Selected photographs will be given proper credit and acknowledgements.




www.pickleweed.org

San Pablo Bay National Wildlife Refuge
Hwy 37 after Lakeville Hwy (707) 649-9464




14th Annual San Francisco Bay Flyway Festival

Friday, February 5, 5 p.m. - 9 p.m.
 Saturday, February 6, 9 a.m. - 4 p.m. • Sunday, February 7, 9 a.m. - 3 p.m.

-  Visit the San Pablo Bay National Wildlife Refuge booth at Festival Headquarters in Building 897 on Mare Island
-  Go on Guided Nature Walks
-  Meet the National Wildlife Refuge System's famous Blue Goose!



Log on to www.fws.gov/sfbayrefuges for a complete schedule of refuge events in January. For a Flyway Festival brochure, call (707) 649-9464 or www.SFbayFlywayFestival.com

Refuge Dispatches

Contributed by Cheryl Strong, Gerry McChesney, and Rachel Tertes

The year 2009 has yet again been a busy one for the San Francisco Bay National Wildlife Refuge Complex. Here are just a few highlights from some of the refuges in the Complex.

Don Edwards San Francisco Bay NWR

The planning process to develop a 15-year adaptive management plan for the Don Edwards San Francisco Bay National

Wildlife Refuge has begun! Public Scoping meetings were held in Fremont, San Jose, and San Mateo on October 28, November 3, and November 5, respectively, to receive comments from the public on how and what the refuge should be managed for, and the types of visitor services offered. Comments received will be taken into consideration for the draft Comprehensive Conservation Plan.

Snowy Plovers, a Federally-listed threatened species, continues to be monitored on refuge lands in partnership with the San Francisco Bay Bird Observatory. Oyster shells had been placed on the pond bottoms of dry salt evaporator ponds in the Eden Landing Ecological Reserve (California Department of Fish and Game) to create

are being built to accommodate roosting birds and nesting shorebirds and terns. The public use trail will be upgraded with wayside exhibits and two viewing platforms. Construction is expected to be finished by August 2010.

Ellicott Slough NWR

Ellicott Slough NWR started the lengthy Comprehensive Conservation Plan (CCP) process in 2009. In anticipation of the plan, staff and volunteers have begun working on identifying plants and birds on various units. Volunteer Tim Kask has identified 165 plant species at the Harkins Slough unit and 132 plant species at the Buena Vista unit to date. The Santa Cruz Bird Club has also been



Construction at Pond SF2

Photo: USFWS



Pacific treefrog

Photo: Alex Baranda



Snowy plover chick

Photo: Kathleen Henderson

additional camouflage for plovers and their chicks. In 2009, this greatly increased the hatching success rates by 67%. The refuge hopes to incorporate this practice in Pond SF2 (located in East Palo Alto just south of the Dumbarton Bridge) to increase Snowy Plover success rates there. Cameras were also used to determine what has been predated on the plovers. Red-tailed Hawks, Northern Harriers, California Gulls, and Common Ravens were caught on film red-handed!

The South Bay Salt Pond Restoration Project continues. Construction activity is noticeable in Pond SF2. Two thirds of this pond will be maintained as shallow water foraging habitat for shorebirds and ducks while one-third of the pond will be managed as dry salt panne. In addition, 30 islands

out to Harkins Slough to start an inventory of refuge birds which will be helpful in the development of the CCP.

For the third year, abnormal frog surveys were conducted as part of the nationwide survey of abnormal amphibians on wildlife refuges. Only one pond, Calabasas Pond, held enough water for the surveys. Several volunteers and staff came out to help catch tree frogs and process them. Two of three survey groups were lucky to observe larval Santa Cruz Long-toed Salamanders. There were about 12% malformations (causes currently unknown) and all the information will go into the national US Fish and Wildlife Service database for an ongoing study. Information can be found at www.fws.gov/contaminants/issues/amphibians.cfm.

In addition to plant and animal surveys, several crews from the California Conservation Corps helped remove non-

native Eucalyptus trees and bull thistle, and created fire breaks. Students from Renaissance High School continue to be involved in restoration and education related to the refuge.

Farallon NWR

Farallon NWR celebrated its 100th anniversary in 2009. In celebration of its

success of managing and maintaining the refuge. The U.S. Coast Guard Sector San Diego provided transportation of roofing material for the Powerhouse, which houses the island's two generators and photovoltaic system. The 129th Rescue Wing of the Air National Guard provided transportation in the replacement of the photovoltaic system on the refuge. These undertakings, so vital

tion has slowed in the last few years. The 2009 high count of 80 pups was obtained. Ways to monitor the colony more effectively are under investigation.

The Comprehensive Conservation Plan has been completed! The final version will be available to the public soon.

Salinas River National Wildlife Refuge

The Salinas River NWR had a very successful Snowy Plover season in 2009, which matched the data for majority of the Monterey Bay Area. The season was off to a slow start due to some abnormal eggs (which were sent off for analysis), but the nesting resumed and plovers fledged. Small numbers of Caspian Terns attempted to breed this year but abandoned the site prior to egg laying. It was believed they bred at the Pajaro Spit this year.

Our orientation kiosk and waterfowl hunt kiosk continue to provide visitors with maps and information about the refuge. In addition, our Snowy Plover brochures and "Where can I take my dog" brochure seem to fly out of the brochure box. Four new interpretive panels to the walking trails will be added in the upcoming months. The panels will highlight a variety of habitats: Grass and Shrub Upland, Coastal Dunes, Salt Marsh, and Salinas River.

Waterfowl hunting began on October 24, 2009 and will end January 31, 2010. During this time, a portion of the River Loop Trail will be closed to non-hunters for safety. There continue to remain WWII practice ammunitions on the beach and in the dunes near the derelict barge. Please do not attempt to touch or remove these practice rounds.



U.S. Coast Guard landing on the Farallones

Photo: USFWS



Northern fur seals

Photo: USFWS

centennial, one of our partners, the Oceanic Society released a film titled *The Farallon Islands: Past, Present, and Future*. Copies may be purchased at the Bookstore in the Visitor Center at Refuge Headquarters in Fremont. The refuge was also featured on segments of San Francisco Public Broadcasting System station KQED's radio and TV show *Quest* and *Huell Houser's California's Gold*.

Partners were a major factor in the

to the operations of the island, could not have happened without their assistance. Volunteers from PRBO Conservation Science contributed greatly to the monitoring of seabirds, migrant land birds, sharks, and elephant seals, and several US Fish and Wildlife Service volunteers assisted with mapping and removal of invasive plants.

The seabird breeding season in 2009 was very mixed. Brandt's Cormorants bred in some of the lowest numbers in memory and had complete breeding failure. This occurred in conjunction with a large starvation event along the central California coast in spring 2009. Common Murres also had very low breeding success, one of the worst years since monitoring started in 1971. Both of those species were affected by a lack of schooling bait fish, their principal prey, in the nearby ocean waters. On the other hand, Cassin's Auklets had their best breeding season since 2004 after several years of poor production. These auklets feed primarily on krill, which were present in abundance this year. Growth for the Northern Fur Seal breeding popula-



Caspian terns

Photo: Donna Dewhurst

Thank you San Francisco Bay Wildlife Society Donors!

We gratefully acknowledge the following donors who have made gifts to the San Francisco Bay Wildlife Society between July 18 and October 15, 2009. 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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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.

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2009 - The Year of Change

by Sue Ten Eyck

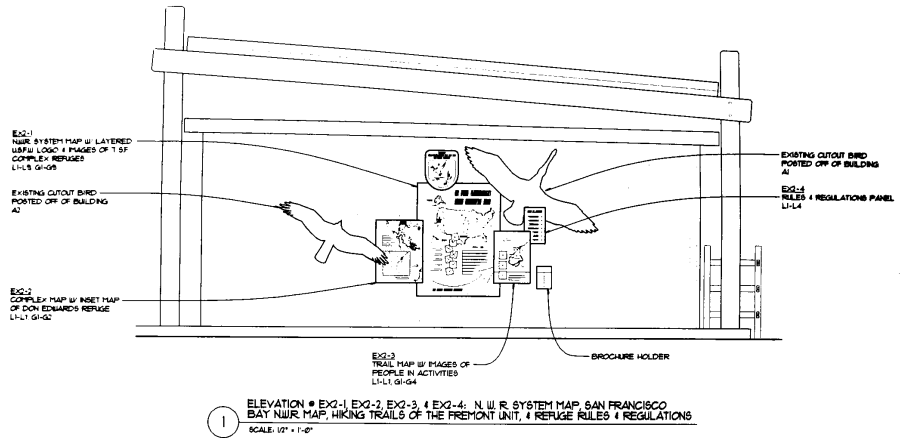
This year has been filled with changes and challenges, equaling growth. The Visitor Center Bookstore moved to new quarters in the “long-term, temporary” Visitor Center on Marshlands Road in Fremont. Although the footprint of the center has been reduced, it offers a spectacular view of the salt marsh. The Bookstore and access to information are much more available to those with limited mobility as there is no steep hill to climb.

The smaller space also created challenges for the San Francisco Bay NWR Complex on the best way to provide information to visitors. To help meet this challenge, San Francisco Bay Wildlife Society contributed \$60,000 for new interactive educational displays to be placed both inside and outside the Visitor Center. Installation of these specially-built displays will occur in February 2010.

While enjoying the Visitor Center, remember to browse through the Bookstore. The Bookstore is stocked with popular bird books, a large selection of children’s books and books related to local natural history. If you do not see a book you want, please ask the Visitor Center volunteer. We are attempting to rotate titles, so the book you’re seeking may be in storage. If you love finger puppets, check the display. New puppets are being introduced frequently. Proceeds from bookstore sales benefit public and biological programs at the San Francisco Bay NWR Complex.

San Francisco Bay Wildlife Society has also been very active with the High Marsh-Terrestrial Ecotone Re-vegetation Project at the Don Edwards San Francisco Bay National Wildlife Refuge Environmental Education Center in Alviso. We were awarded several grants from the Satterberg Foundation, The San Francisco Foundation and the National Fish and Wildlife Foundation Northern California Coastal Restoration Program. Through these grants, staff was hired to develop plans, remove non-native species, prepare the soil for next spring’s growth, and experiment with planting native vegetation. Next spring we expect a burst of new growth in the high marsh area.

The auditorium at the Environmental Education Center is receiving a major face-



lift thanks to a matching grant we received from the National Fish and Wildlife Foundation. We will need to match this grant dollar for dollar in order to complete this project. To date, the Wildlife Society still needs to raise additional funds. Your contribution can help. Included in the auditorium exhibits will be a mural designed by a local artist which will depict the changing times in the South Bay beginning with the ice age and progressing toward salt pond restoration, offering a glimpse of what the area might look like after the restoration.

On a smaller scale, but no less important, the Society sponsored the Endangered Species Poster Contest at Fremont and the South Bay Bird Fest and Shark Day at Alviso. Our contracts with the City of San Jose and Santa Clara Valley Urban Runoff Pollution Prevention Program enable us to employ two environmental education specialists at the Environmental Education Center. These specialists work with school children, youth groups and adults in a variety of activities relating to appreciating and preserving the San Francisco South Bay.

Your membership in San Francisco Bay Wildlife Society greatly enhances our ability to continue outreach to support our mission, and to promote public awareness and appreciation of the San Francisco Bay and its natural history. We would love to have you join us. If you are interested in assisting us as an advisor or Board member please contact Sue Ten Eyck, at 510-745-8170 for more information.

Sue Ten Eyck is the Program Administrator of the San Francisco Bay Wildlife Society.



Intern Cara Lovell recognizes an Endangered Species Poster Contest winner

Winter Activity Schedule

December

Saturday, December 5

Beginning Birding Clinic Environmental Education Center, Alviso 9:00 a.m. – 11:30 a.m.

If you can't tell your egrets from your cormorants this class is for you! We'll learn about binoculars, identification books, and other birding basics through hands-on activities and conversation. Then we'll go out into the field to practice our new skills. Binoculars and books provided during the class. Be prepared to be outdoors in the weather for about an hour. Reservations Required. 408-262-5513 ext.106.

Twilight Marsh Walk Visitor Center, Fremont 4:00 p.m. – 5:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 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. Meet at the Visitor Center located by the first parking lot to the right on Marshlands Road. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-745-8695. Led by Mary and Gene Bobik.

Sunday, December 6

Salinity Sleuths Environmental Education Center, Alviso 1:00 p.m. - 2:30 p.m.

Calling all sleuths! You are invited to come investigate the salt marshes and find out why salinity is so essential. This program will focus on the importance of Bay salinity and how it relates to endangered species habitat. Participants will have the opportunity to hear from a presenter and go on a guided walking tour along the New Chicago Marsh Trail. RESERVATIONS REQUIRED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.



Saturday, December 12

Exploring the Dunes Antioch Dunes NWR, Antioch 10:00 a.m. – 11:00 a.m.

Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes National Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

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

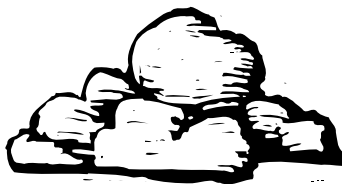
Calling all Junior Girl Scouts of Santa Clara County! Anyone out there need to earn a Wildlife badge? We've got the program just for you! Come to the wildlife refuge and learn about features of different creatures, observe animal behavior, see how you can help wildlife, and so much more. Take a walk to explore the habitats at the south end of the bay. Maximum ratio of 1 adult for every 5 children. Space is limited to 20 people and program fills quickly. **Reservations for winter scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full.** Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

*Marshlands of Dreams Visitor Center, Fremont 10:30 a.m. – 11:30 a.m.

Join a refuge ranger 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. Led by Paul Mueller.

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

Why is it summer in San Jose, California when it's winter in Sydney, Australia? Do you know the difference between the equinox and solstice? Discover the answers to these questions, learn some interesting facts about weather, and how it affects people and wildlife. Suitable for ages 9 and up. Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.



Sunday, December 13

In Search of: California Grey Fox Visitor Center, Fremont 2:00 p.m. - 3:30 p.m.

Come learn about the California Grey Fox, the only canine which can climb trees. What do they look like? Where do they live? What do they eat? Where have they been seen? What is the best time to see them? What's in our habitat that makes them unique to the Bay Area? We will share information about this rarely-seen fox to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about the California Grey Fox and use of binoculars. Dress warmly and bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.

Saturday, December 19

Salt Pond Restoration 101: An Introduction to the Project Environmental Education Center, Alviso 11:00 a.m. – 12:00 p.m.

Restoration of 15,100 acres of South San Francisco Bay salt ponds to wetlands habitats has begun. Please join us for overview of this incredible project happening in our backyard. Program will be held indoors in the auditorium. All are welcome!

Sunday, December 20

Chompers & Stompers Environmental Education Center, Alviso 2:00 p.m. – 4:00 p.m.

Have you ever wondered why birds come in so many shapes, sizes, and colors? Come and find out why! We will examine different bird specimens we have collected over the years to see how birds have evolved into some extraordinary features and behaviors. Participants will have the opportunity to listen to a presenter and go on a guided walking tour along the New Chicago Marsh Trail. RESERVATIONS REQUIRED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

Sunday, December 27

In Search of: California Grey Fox Visitor Center, Fremont 2:00 p.m. - 3:30 p.m.

Come learn about the California Grey Fox, the only canine which can climb trees. What do they look like? Where do they live? What do they eat? Where have they been seen? What is the best time to see them? What's in our habitat that makes them unique to the Bay Area? We will share information about this rarely seen fox to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about the California Grey Fox and use of binoculars. Dress warmly and bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.

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

Visitor Center, 2 Marshlands Road, Fremont – (510) 745-8695 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

January

Saturday, January 9

Exploring the Dunes Antioch Dunes NWR, Antioch 10:00 a.m. – 11:00 a.m.

Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes National Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

*Brownie Eco-Explorer Patch Environmental Education Center, Alviso 10:00 a.m. – 12:00 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 end of the bay. Maximum ratio of 1 adult to 5 children. Space is limited to 20 people and program fills quickly. **Reservations for winter scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full.** Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

*Marshlands of Dreams Visitor Center, Fremont 10:30 a.m. – 11:30 a.m.

Join a refuge ranger 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. Led by Paul Mueller.

*Webelos Naturalist Badge Environmental Education Center, Alviso 2:00 p.m. – 4:00 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. Maximum ratio of 1 adult for every 5 children. Space is limited to 20 people and program fills quickly. **Reservations for winter scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full.** Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

Sunday, January 10

Watershed Appreciation Environmental Education Center, Alviso 1:00 p.m. - 2:30 p.m.

Did you know that you live in an incredibly unique and critical watershed? Join us at the Environmental Education Center to learn about what makes this place so exciting, and how you can help protect it.

Participants will have the opportunity to hear from a presenter, take part in hands-on activities, and go on a guided walking tour along the New Chicago Marsh Trail. **RESERVATIONS REQUIRED** – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

*In Search of: Salt Marsh Harvest Mouse Visitor Center, Fremont 2:00 p.m. - 3:30 p.m.

Come learn about the tiny (about the size of your thumb) endangered Salt Marsh Harvest Mouse. What do they look like? Where do they live? What do they eat? Where have they been seen? What's in our habitat that makes them unique to the Bay Area? We will share information about this rarely seen mouse to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about the Salt Marsh Harvest Mouse and use of binoculars. Dress warmly and bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.

Saturday, January 16

Oliver Salt Works Hike Eden Landing Ecological Reserve, Hayward 10:00 a.m. – 12:00 p.m.

Hidden among the salt ponds is one of the East Bay's most intriguing historical sites. The refuge and the South Bay Salt Pond Restoration Project are sponsoring this hike to the old Oliver Salt Works within the Eden Landing Ecological Reserve. We'll be walking into an area of the Reserve not yet open to the public so please be prepared to walk several miles on unimproved levees. Reservations required. Call 408-262-5513 ext.106.

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

Do you need to fulfill community service requirements? Or would you just like to come lend a hand? Come help in our native plant garden by removing nonnative plants, pruning, mulching, or various other jobs that help protect wildlife and clean up our gardens. It's a great service project for scout groups, high school students needing community service, church groups, or home-schooled groups. Bring your own gloves or borrow a pair of ours – tools are provided. Dress in layers and bring water and sunscreen. Be prepared to get dirty! Ages 9 and up. Participants 18 and under must be accompanied by a chaperone. Call Debra for reservations at 408-262-5513 ext. 102.

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

It's winter and most waterfowl have migrated from the North to a milder climate. Many are spending the winter here in the Bay Area. Enjoy a brief slide show about our migratory ducks and geese. Then join us on a leisurely walk to see which ducks are residing at the refuge this year. Open to all ages. Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.

Winter Activity Schedule

Twilight Marsh Walk Visitor Center, Fremont 4:00 p.m. – 5:30 p.m.

Experience the salt marsh at twilight on an easy stroll along Tidelands (1 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. Meet at the Visitor Center located by the first parking lot to the right on Marshlands Road. Not suitable for young children. **RESERVATIONS REQUIRED.** Call 510-745-8695. Led by Mary and Gene Bobik.

Friday, January 22

*Night Sky Party! Environmental Education Center, Alviso 6:30 p.m. – 8:30 p.m.

Meet the stars of winter! Join amateur astronomer, Bob Havner and some friends as we learn about constellations. Make a star chart and then venture outside to view the night sky through a telescope. Afterwards, warm up with some hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly, as it gets cold in the evening. Fun for the whole family! Program will go on sprinkling rain or shine. Program will be canceled only if it is pouring rain. **RESERVATIONS REQUIRED.** Call Debra at 408-262-5513 ext 102.

Saturday, January 23

Beginning Birding Clinic Environmental Education Center, Alviso 9:30 a.m. – 12:00 p.m.

If you can't tell your egrets from your cormorants this class is for you! We'll learn about binoculars, identification books, and other birding basics through hands-on activities and conversation. Then we'll go out into the field to practice our new skills. Binoculars and books provided. Be prepared to be outdoors in the weather for about an hour. Reservations required. Call 408-262-5513 x106.

*Brownie Eco-Explorer Patch Environmental Education Center, Alviso 12:00 p.m. – 2:00 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 end of the bay. Maximum ratio of 1 adult to 5 children. Space is limited to 20 people and program fills quickly. **Reservations for winter**

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

Visitor Center, 2 Marshlands Road, Fremont – (510) 745-8695 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Winter Activity Schedule

scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full. Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

*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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Meet at the Visitor Center located by the first parking lot to the right on Marshlands Road. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-745-8695.

*Beginning Bird Photography Workshop

Environmental Education Center, Alviso

3:00 p.m. – 5:00 p.m.

Whether you are interested in photography tips or would like to get to know some of the birds commonly sighted at the refuge, join us! We will discuss ideal sighting and photography conditions, lighting, composition, and equipment. We will also have a slide show to familiarize you with some common shorebirds at the refuge. Then we will go on an easy walk and try out our skills. Please be sure to bring your camera and/or binoculars and wear comfortable walking shoes. Led by Jen Woo. Recommended for ages 14 and up. Call Debra at 408-262-5513 ext. 102 for reservations.

Sunday, January 24

Magical Mystery Marsh Show

Environmental Education Center, Alviso

2:00 p.m. – 4:00 p.m.

The refuge's own Amazing Xander will astonish and excite you with mysterious and eye-popping illusions. Come and see why your local national wildlife refuge is truly a magical place. Participants will have the opportunity to take part in a magic show, hear from a presenter, and go on a guided walking tour along the New Chicago Marsh Trail. RESERVATIONS REQUIRED – Spaces are limited, all ages are welcome. Call Eric at 408-262-5513 ext. 104.

In Search of: Salt Marsh Harvest Mouse

Visitor Center, Fremont

2:00 p.m. - 3:30 p.m.

Come learn about the tiny (about the size of your thumb) endangered Salt Marsh Harvest Mouse. What do they look like? Where do they live? What do they eat? Where have they been seen? What's in our habitat that makes them unique to the Bay Area? We will share information about this rarely seen mouse to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about the Salt Marsh Harvest Mouse and use of binoculars. Dress warmly, bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.

Saturday, January 30

Birding the Refuge

Environmental Education Center, Alviso

9:30 a.m. – 11:30 a.m.

In the wintertime, there's always something great to discover on the refuge. Join us as we practice our birding skills in the different habitats around the Education Center. Families and beginners welcome. Meet near the building entrance. Call 409-262-5513 x106 for information.

*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 in the Visitor Center, 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 the tides shape these vital communities. Easy short hiking level. Ages 9-90 years. Call 510-745-8695 for reservations.

Sunday, January 31

Duck Walk

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

Thousands of ducks winter in the San Francisco Bay every year.

Hear a short lecture on duck identification. Then we'll head out on the trail to try your new skills. A limited number of binoculars are available to borrow. Dress warmly. Led by Carmen Minch.



February

Saturday, February 6

*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. Maximum ratio of 1 adult for every 5 children. Space is limited to 20 people and program fills quickly. Reservations for winter scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full. Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

*Marshlands of Dreams

Visitor Center, Fremont

10:30 a.m. – 11:30 a.m.

Join a refuge ranger 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. Led by Paul Mueller.

*Webelos Naturalist Badge

Environmental Education Center, Alviso

2:00 p.m. – 4:00 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. Maximum ratio of 1 adult for every 5 children. Space is limited to 20 people and program fills quickly. Reservations for winter scout programs begin on Tuesday, November 24th between 3-4 p.m. and will continue until program is full. Call Debra at 408-262-5513 ext. 102. (Note: badges are not provided)

Sunday, February 7

Webelos Naturalist Program

Visitor Center, Fremont

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. Space is limited to 15 Webelos. Call 510-745-8695. Led by June Smith.

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

Visitor Center, 2 Marshlands Road, Fremont – (510) 745-8695 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Saturday, February 13

Birding the Refuge

Environmental Education Center, Alviso

9:30 a.m. – 11:30 a.m.

In the wintertime, there's always something great to discover on the refuge. Join us as we practice our birding skills in the different habitats around the Education Center. Families and beginners welcome. Meet near the building entrance. Call 409-262-5513 x106 for information.

*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 in the Visitor Center, 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 the tides shape these vital communities. Easy short hiking level. Ages 9-90 years. Call 510-745-8695 for reservations.

Exploring the Dunes

Antioch Dunes NWR, Antioch

10:00 a.m. – 11:00 a.m.

Here's your chance to explore this refuge that is usually closed to the public. This guided tour (1-1.5 mile) will focus on the wonders of Antioch Dunes National Wildlife Refuge. Wear sturdy shoes for the sandy hike along the dunes. All ages welcome. No reservations required. No facilities. Contact 510-521-9624 for additional information and directions.

Sunday, February 14

Valentine's Day In the Marsh

Environmental Education Center, Alviso

1:00 p.m. - 2:30 p.m.

Spice up your Valentine's Day with a guided tour of the New Chicago Marsh. The Environmental Education Center in Alviso hosts a variety of habitats that support incredibly unique native flora and fauna. Participants will have the opportunity to hear from a presenter and go on a guided walking tour of the New Chicago Marsh Trail. RESERVATIONS REQUIRED – All ages are welcome. Call Eric at 408-262-5513 ext. 104.

*In Search of: California Clapper Rail

Visitor Center, Fremont

2:00 p.m. - 3:30 p.m.

Come learn about the endangered and rarely seen California Clapper Rail. What do they look like? Where do they live? What do they eat? Where have they been seen? What are the best time and the best tide to view them? What's in our habitat that makes

them unique to the Bay Area? We will share information about this rarely seen bird to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about Clapper Rails and use of binoculars. Dress warmly and bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.

Saturday, February 20

Ravenswood Hike

Bedwell Bayfront Park, Menlo Park

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

The 2.3-mile perimeter trail at Bedwell Bayfront Park offers great opportunities to discover winter wildlife and to discuss how future wetlands restoration will shape this piece of the Bay. Offered by the refuge and the Friends of Bedwell Bayfront Park. Meet at the main parking lot bathrooms at Bedwell Bayfront Park. Call 408-262-5513 ext. 106 for information.

*Living Wetlands

Environmental Education Center, Alviso

1:30 p.m. – 3:00 p.m.

Our refuge consists of salt marsh, salt ponds, and tidal and non tidal sloughs. Learn about human and wildlife dependence on our wetlands. How does the marsh affect a nice seafood dinner at your favorite restaurant? The answers can be found by enjoying a slide show depicting the life and death struggles of our marsh inhabitants. Open to all ages. Led by Ed Kantack. Call Debra at 408-262-5513 ext. 102 for reservations.

* Beginning Bird Photography Workshop

Environmental Education Center, Alviso

3:00 p.m. – 5:00 p.m.

Whether you are interested in photography tips or would like to get to know some of the birds commonly sighted at the refuge, join us! We will discuss ideal sighting and photography conditions, lighting, composition, and equipment. We will also have a slide show to familiarize you with some common shorebirds at the refuge. Then we will go on an easy walk and try out our skills. Please be sure to bring your camera, binoculars, and wear comfortable walking shoes. Led by Jen Woo. Recommended for ages 14 and up. Call Debra at 408-262-5513 ext. 102 for reservations.

Twilight Marsh Walk

Visitor Center, Fremont

4:30 p.m. – 6:00 p.m.

Experience the salt marsh at twilight on an easy stroll along Tideland (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. Meet at the Visitor Center located by the first parking lot to the right on Marshlands Road. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-745-8695. Led by Mary and Gene Bobik.

Winter Activity Schedule

Saturday, February 27

*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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Meet at the Visitor Center located by the first parking lot to the right on Marshlands Road. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-745-8695.

Sunday, February 28

Duck Walk

Visitor Center, Fremont

10:00 a.m. – 11:30 a.m.

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

*In Search of: California Clapper Rail

Visitor Center, Fremont

2:00 p.m. - 3:30 p.m.

Come learn about the endangered and rarely seen California Clapper Rail. What do they look like? Where do they live? What do they eat? Where have they been seen? What are the best time and the best tide to view them? What's in our habitat that makes them unique to the Bay Area? We will share information about this rarely seen bird to optimize your chances of capturing a glimpse of them. The tour will be comprised of a 45-minute lecture about Clapper Rails and use of binoculars. Dress warmly and bring binoculars and rain gear for a 45-minute walk. Led by Roy Sasai.



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Visitor Center, 2 Marshlands Road, Fremont – (510) 745-8695 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Field Trips to the Refuge

General Field Trip 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 the Visitor Center in Fremont, and Wetland Round-Up and Slow the Flow field trip programs 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.

Field Trips at the Learning Center in Fremont

Wetland Round-Up

Explore the habitats of the refuge! Investigate creatures of the mud flats, collect plankton from the slough, and taste pickleweed from the salt marsh. This field trip is designed for grades K-6, for up to 65 students. Wetland Round-Up is offered Tuesday – Friday from March to May, 2010.

NEW MAIL-IN RESERVATION PROCEDURES FOLLOWS.

Field Trip Orientation Dates at the Learning Center in Fremont

All Orientations are from 4:00 p.m.-7:30 p.m.

To be announced.

Call the Environmental Education Intern at 510-377-7269 to attend an orientation.

Mail-In Registration for Spring Wetland Round-Up Field Trips for Fremont

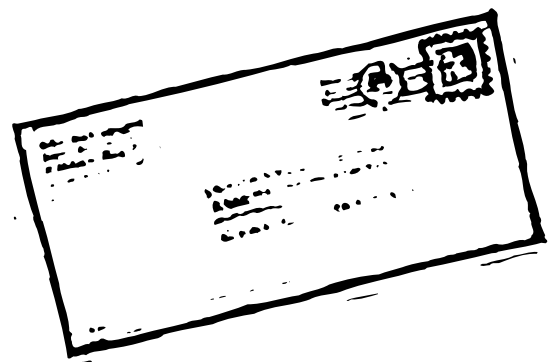
A new mail-in registration will replace the former call-in process. Here's how it works:

- Mail-in registration for **Spring 2010** will begin on Tuesday, December 1, 2009.
- Registration Forms will be available on-line at http://www.fws.gov/desfbay/EE_Registration.htm
- You will be able to choose from a list of available dates and indicate your 1st, 2nd and 3rd choices on the form.
- Completed forms should be mailed to our offices in the following manner:
WRFT Registration/ EE Office
9500 Thornton Ave.
Newark, CA 94560
- You may also FAX your request to:
510-792-5828, attention EE program

OR, you may drop off your completed form at the Visitor Center along Marshlands Rd in Fremont.

We will not be accepting electronic versions of the forms at this time.

- All forms received will be opened on Tuesday, December 15, 2009.
- Every effort will be made to accommodate your requests. However, we may need to offer alternative dates if we cannot assign you your preferred dates.
- Selections will be made in a timely fashion. You will be notified by your preferred method as indicated on your form.
- We will continue to take requests after Tuesday, December 15, 2009 until all available dates for the spring season have been filled.



Field Trips at the Environmental Education Center in Alviso

Wetland Round-Up

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 March to May, 2010.

We will begin scheduling Spring 2010 field trips on Tuesday, December 8 from 4:00 p.m. – 5:00 p.m. To make a reservation or get more information, call the Environmental Education Intern at 408-262-5513 ext 103.

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

All Orientations are from 4:00 p.m. – 7:30 p.m.

To be announced.

Call the Environmental Education Intern at 408-262-5513 ext 103 to attend an orientation. ** Please note: The cut off date to make a reservation is the Friday before each orientation date.

The 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 – 12th grade students, although 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, call Eric McKee, the Slow the Flow Program Coordinator at 408-262-5513 ext 104.

Borrow Discovery Packs for Free at the Environmental Education Center in Alviso!

Explore the salt marsh habitat and the birds of the refuge with your family or small youth group! The Discovery Pack includes an activity booklet, and all of the equipment such as magnifying lenses, binoculars and bug boxes that you will need to take a closer look at the salt marsh and the birds! The backpack is suitable for up to six people, ages kindergarten - adults. There are also group packs available for 12 – 24 people. Please call in advance if you would like a group pack. You can check out the Discovery Packs free of charge at the Environmental Education Center. The Environmental Education Center is open Saturday and Sunday from 10:00 a.m. – 5:00 p.m. For questions please call 408-262-5513 ext 103.

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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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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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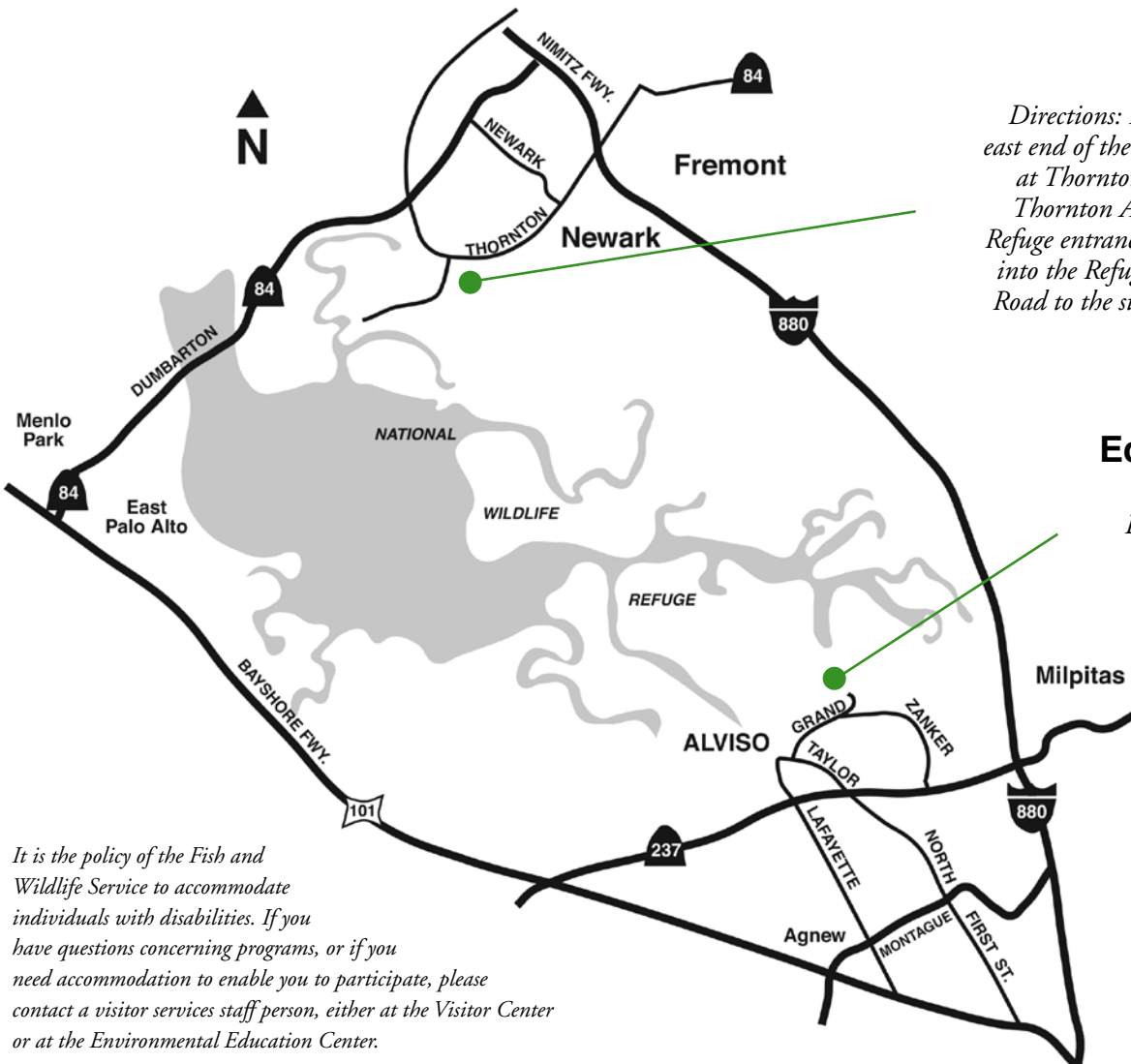
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Headquarters & Visitor Center

(510) 745-8695
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 Marshlands Road to the stop sign. Turn left into the parking lot.

Environmental Education Center

(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.