Volume 28, Number 4

Bats and the San Francisco Bay

by Dave Johnston

On a dark, moonless, summer night while paddling a canoe down the Alviso Slough in South San Francisco Bay, we listened for bats on our Anabat II bat detector. The Anabat, which detects high frequency sounds that are inaudible to humans and converts them to lower frequency sounds, began emitting a familiar sequence. Matt yelled out, "We're getting another bat! What do you think it is?"

"Likely a Mexican free-tailed bat," I answered. "That species typically has longer, monotone-like call sequences when compared with other species such as the Yuma myotis."

Katie Reich, Laura Curtis, and Matt Pyrch - all students from Santa Clara University, had joined me during the summer months of 2002 to study bats along the Guadalupe River watershed through a Santa Clara Valley Water District grant. I wanted to look at water quality and bat distribution along the watershed. To our surprise, the bat detector indicated that bats were flying regularly over brackish sloughs and salt marshes in the south bay. Are bats foraging over these areas? If they are, what are they eating? Detecting bats flying over the sloughs didn't necessarily mean they were foraging. Rather, one could argue that the bats were simply flying from one point to another and the slough happened to be the route they were taking.

A trusted method in determining the diets of animals is to examine their fecal matter. One of my students, Katie Reich, was particularly interested in entomology and together, we identified insect parts in bat pellets under the microscope. This is a painstaking process, but thankfully, I had gained plenty of practice while investigating individual diets of pallid bats as part of my Ph.D. research. First, however, we would need to catch the bats.

Capturing bats flying over the main channels of sloughs using mist nets would have been extremely challenging given the currents and size of the sloughs. We did capture a few bats flying over tidal waters using mist nets, but the bulk of them were captured at roost sites using hoop nets. These roost sites would typically reside at the edge of the bay, such as buildings alongside Alviso Slough. We were able to capture and release Yuma myotis. I knew from previous experiences with this species that these bats were riparian and wetland obligates, but I didn't know where these bats were feeding.

In our preliminary findings, we found bats roosting alongside the slough ate 32% flies, 1% moths, and 67% true bugs. Upon further examination of the insect parts we were able to identify the prey to species in some cases. We matched many of the fly parts to two species of flies we had netted in salt marsh habitat. The parts that belonged to the true bug were identified as parts of the reticulated water boatman (*Tricholcorixa reeticulata*), a brackish water species of water boatman found in San Francisco Bay! Good enough evidence to

Mexican free-tailed bat. © Dave Johnston

Continued page 2

Bats and the San Francisco Bay

Continued from page 1

state that these bats were indeed foraging over brackish water and salt marshes of South San Francisco Bay. Although the Mexican free-tailed bat was not captured, it too, is likely to forage over the sloughs and salt marshes based on our acoustic monitoring.

The Yuma myotis and Mexican free-tailed bat are not the only California species known to forage over salt marshes and estuaries. Big brown bats, along with Mexican free-tailed bats, forage in the evening over the salt marshes and waters of Elkhorn Slough along the coast of Monterey Bay. Unlike the Yuma myotis, neither of these species are wetland obligates. So in addition to the estuary, big brown and Mexican free-tailed bats also forage over a variety of other habitats including oak woodland, oak savannah, and agricultural lands.

Additionally, lasiurine bats (a genus of highly migratory bats with furred tails), such as the hoary, western red, and silver-haired bats, are also expected to fly and likely forage over San Francisco Bay. We know that the hoary bat flies hundreds to sometimes thousands of miles from breeding areas in Canada to over-wintering areas in Mexico. We also know that some hoary bats spend their winters in the San Francisco Bay Area, an area of moderately cool, even temperatures. Likewise the beautiful western red bat spends winters in the San Francisco Bay. Some of the population breeds along old growth riparian habitat in the Central Valley. We know less about the silver-haired bat, but this forest dweller may also fly over the bay during migratory seasons.

One of the limiting factors for these bats is roost sites. If the distance from a roost to the foraging area is too great, the costs to the bats for flying long distances to foraging areas are not economical. It is believed that if Santa Clara Valley had not subsided 11 feet below sea level as a result of over-drafting the water table, large cottonwood trees would grow much closer to salt marshes and areas of brackish water than they do today. The proximity of the cottonwoods would have allowed bats to roost in the trees and forage in the salt marshes. Very few cottonwoods occur close to the bay lands today but anthropogenic structures, such as bridges and buildings, often provide bats with day and night roosting habitat. To date, I've discovered three major roost sites adjacent to sloughs and salt marshes of the south bay lands. Likely, there are similar roosts in other parts of the San Francisco Bay.

Most California bats to not hibernate for the winter, but rather, roost in cool even-temperature areas that neither get too cold nor get too warm. These bats go into torpor for a few days at a time, but arouse to forage and drink water. About 1,000 Mexican free-tailed bats spend winters within two miles of the cool climate associated with the bay. In early March, 950 of these wintering bats disappeared for the summer and only about 50 remained. Although we don't know where these bats migrated to, unpublished data from me and Phil Leitner suggest that populations of Mexican free-tailed bats breed in early summer in the warm Central Valley and winter around the San Francisco Bay Area.

Yuma myotis, on the other hand, are associated with cooler climates and do breed in locations around the bay. We know very little about the movements of this species but we do know that individuals forage year-round at the edge of the bay based on work that I and volunteers have conducted on the lower Coyote Creek the past three years. To date we have dietary samples from about 80 individuals that were caught during the four different seasons of the year.

The Don Edwards San Francisco Bay National Wildlife Refuge recently converted a historic silo into a bat house. I became involved with the project a few years ago when the manager, Clyde Morris, asked if I would be interested in helping Meadowsweet Dairy retrofit a silo into a bat house. Meadowsweet Dairy is a group of artists who converts materials found on site into a sculpture that provides wildlife habitat. I was a bit skeptical at first because people tend to like bat houses more than the bats, but I accepted the challenge.

The site of the silo at Mayhew's Landing in Newark, across the road from the Refuge's main entrance, is not ideal for a bat roost. It is in an area where summer temperatures are generally too cool for most species of bats to form maternity colonies. Male and female bats go their separate ways in early spring after mating in the fall and winter. Females will then gather together and raise their young, forming a maternity colony. But, the site has possibilities. After surveying the surrounding area, I discovered a small maternity colony of Yuma myotis a couple of miles from the silo and a wintering site for the Mexican free-tailed bats. If condi-

Where to See Bats in South San Francisco Bay

The best time to see bats is at dusk. Here are some suggested sites. Please follow all rules and regulations of each site.

1. **Palo Alto Baylands Natural Preserve**, Emily Renzel Wetlands and along Matadero Creek on the Mayfield Slough from the Marsh Loop Bay Trail. Open Sunrise to Sunset
2. **Alameda Creek Trail** along Alameda Creek, near Coyote Hills. Open 5 a.m. – 10 p.m.
3. **Don Edwards San Francisco Bay National Wildlife Refuge LaRiviere Marsh** November 1 – March 31, 7 a.m. – 6 p.m., April 1 – October 31, 7 a.m. – 8 p.m.
4. **Alviso Slough** from the levee near the South Bay Yacht Club in Alviso

Bats and the San Francisco Bay

Continued from page 2

tions are right, the female Yuma myotis bats may establish a maternity colony in the silo. Perhaps the Yuma myotis and the Mexican free-tailed bats would use the silo the same way they were using the bridge two miles away.

After some discussion with artists Henry Corning and Glenda Griffith, we decided to provide habitat not just for roosting bats, but for birds as well. Birds such as cliff swallows, barn swallows, northern rough-winged swallows and white-throated swifts may also use the silo as a breeding ground. Additionally, white-throated swifts might over-winter in the silo just as Mexican free-tailed bats may use the structure during the same time period.

Construction for the roof and the habitat within the silo began the summer of 2007. "Bat boxes" lined the inside of the silo where we predicted temperatures would be stable and relatively cool. Conversely, the maternity colony would require something warmer. A collar was attached around the top of the silo under the sheet-metal roof. This would heat up during the day and potentially provide maternity colonies with the warmth they prefer. The installation of two small fans would help transfer additional heat from the silo attic into the top portion of the silo in the summer.

For the cliff and barn swallows, all that is needed is a tall, vertical surface and a protective overhang. The roof, which also resembles a giant lid for the silo, is the perfect shape for this type of habitat. For the northern rough-winged swallow and white-throated swifts, holes were cut in the roof so these birds could enter the "lid" much the same way they enter the weep holes of a large highway bridge.

Temperature data loggers were installed to measure temperatures in several places of the silo with the hopes of learning more about temperature regimes associated with the structure. Only time will tell if the structure will be used by bats. If bats do move into the structure,

Continued on page 4

Henry Corning stands in front of the nearly completed bat house.
© Dave Johnston

The Age of Restoration

Refuge Reflections

By Mendel Stewart

I think of the first 200 years of U.S. history as an age when humankind did not believe there were any limits to our natural resources. Our natural resources seemed so plentiful that it appeared they could never be diminished. Fortunately, during the latter half of the 20th century, we began moving into an age of conservation and restoration. In some places we are starting to take significant steps toward ecosystem restoration. If you look across the country you will find a variety of large scale ecosystem restoration projects underway - the Everglades, the Great Lakes, the Chesapeake Bay, and the Louisiana coast to name a few.

Ecosystem restoration is a business that requires a long-term commitment by our society. This commitment may involve decades before seeing the return on investment. In general, this is not something society does well. However, the initial commitment by State and Federal governments and by private foundations to acquire thousands of acres of San Francisco Bay's degraded wetlands is an encouraging example of a sound investment in our bay's ecological future. There are many other important restoration projects around the bay. Whether they are spearheaded by Federal, State or local government, or private organizations, they all have one thing in common - the need for long-term funding. Funding is needed not only for the initial restoration work, such as constructing or removing levees and establishing vegetation, but also for long-term monitoring. Capturing lessons learned from both successes and failures are necessary to inform our future work. On our National Wildlife Refuges around the bay, we are committed to moving forward with restoration planning, and to working cooperatively with our partners in a way that maximizes our available funding.

In my position as a Manager, many ideas to address the long-term funding of restoration projects come across my desk. One that I would like to bring to your attention is the recently released report by Save The Bay entitled *"Greening the Bay: Financing Wetland Restoration in San Francisco Bay."* This report highlights the funding needs of wetland restoration work around the bay, recognizes the long-term nature of the effort and presents ideas for ways to help solve the problem. You can check it out at ***www.saveSFbay.org/greeningthebay***

Bats and the San Francisco Bay

Continued from page 3

we hope to learn how temperatures play a significant role during different parts of their natural history.

How bats use the San Francisco Bay is still largely unknown. What we do know is that Yuma myotis and Mexican free-tailed bats are foraging over marshes and sloughs around dusk. So the next time you sit down for dinner, take a moment to marvel at the diversity of the San Francisco Bay ecosystem, and at earth's only flying mammal.

Dave Johnston is a Senior Wildlife Ecologist at H. T. Harvey & Associates. He is an Adjunct Professor at San Jose State University and taught for several years at Santa Clara University. He is currently working on a Conservation Plan for Bats of California through the Museum of Vertebrate Zoology at UC Berkeley. Dave also has bat-related projects in Belize and Mexico.

Bat Facts - Do you Know?

- Bats are the only mammals that fly. Flying squirrels can glide from tree to tree, but bats sometimes fly at 10,000 feet when they migrate.
- Bats are not rodents. They are more closely related to primates and humans. The scientific name for bats is Chiroptera, which means, "hand-wing". Their wing bones are analogous to our hand bones with a thumb and four fingers.
- Bats are not blind. Some bats can see better than others, but no bats are blind.
- Bats in the Bay Area eat insects. Bats usually need to eat from about one-half of their weight to their whole weight in insects every night to nurse their babies! Some bats in southern California drink flower nectar from agave flowers. Other bats that do not occur in California eat fruit and pollen. Carnivorous bats that live elsewhere eat other vertebrates such as frogs, fish, birds, small mammals and even other bats.

- Bats are beneficial to humans. They eat enormous numbers of insects, pollinate plants that provide food for humans, and reseed cut forests. Bacteria in their guano is used to improve soaps, make gasohol, and produce antibiotics. Bat guano makes excellent fertilizer.
- Bats do not get caught in people's hair. Insect-eating bats have a sophisticated sonar system that allows them to detect flying insects using echolocation. Bats easily avoid bumping into things.
- There are no vampire bats in the United States. Of the 1,000+ different species of bats, only three species are vampires. Of these, only the common vampire bat in Latin America feeds on the blood of large mammals, the other two species prefer to feed on birds.
- Most bats do not carry rabies. Less than ½ of 1% of bats harbor the rabies virus. Rabid bats are rarely aggressive. Far more people are killed by dog attacks, bee stings, power mowers, or lightning than rabies from bats. Nevertheless, rabies is a dangerous disease. Therefore, never touch a bat or any other wild animal. If you find a wild animal that appears injured or ill, call your local animal control for assistance.
- Bat populations are under severe pressure due to habitat loss and pollution. According to the U.S. Fish & Wildlife Service, seven of the 45 species of bats living in the U.S. are in danger of becoming extinct. Of the 24 species found in California, over half of them are California species of special concern.

- Mexican free-tailed bats, a common species in California, are very social. They cluster in large colonies, often inside the expansion joints of bridges over watercourses. Mother bats can find their babies amongst a nursery of tens of thousands of crying bats by their unique voices and smells.
- Bats can drop their internal temperature and go into torpor (like hibernation) if the weather changes and the food supply drops. However, disturbing a hibernating bat can cause the bat to raise its body temperature in preparation for escape, using 10 to 30 days of stored fat reserve. Because bats have very few energy reserves, they can die if disturbed too many times, especially during winter months. Babies are particularly vulnerable during cool periods in late spring and early summer.
- Many organizations are trying to conserve bat populations. Mining companies with abandoned caves, conservation groups, government wildlife services, and private citizens who simply love bats are working to save habitat, educate the public, and physically protect these unique and wonderful creatures.
- Several species of bats might make their home in Mayhews Landing Silo, including: Mexican free-tailed bats, Yuma bats, big brown bats and possibly pallid bats and Townsend's big-eared bats.

Trails

at Don Edwards San Francisco Bay National Wildlife Refuge

Don Edwards San Francisco Bay National Wildlife Refuge spans nine cities and three counties, and contains over 30 miles of hiking trails. Refuge Manager and birding enthusiast Clyde Morris continues to highlight trails found on America's first urban National Wildlife Refuge. For descriptions of other trails, contact Carmen Minch at carmen_leong-minch@fws.gov.

Name: Alviso Slough Trail

Mileage: 9 mile-loop

Trail Use: Walking & bicycling; dogs are prohibited

Trail Conditions: Flat, compacted dirt levee. Trail turns to mud with rain. Strong winds are common in the summer afternoons.

Highlights: This trail traverses through ponds with the largest quantity of waterbirds found on the refuge - over 10,000 ducks in some ponds. It connects with the Mallard Slough Trail making a 14-mile hike possible. When the trail meets Coyote Creek at mile 4, it is far from human development (very peaceful). It makes an excellent bike ride.

Directions to Trailhead: The trailhead is at the Alviso Marina in Alviso. From Highway 237, exit at Lafayette/Gold Street. Head north onto the Gold St. Connector and left onto Gold St. Turn left onto Elizabeth St. and right onto Hope St., which leads you to the Alviso Marina. To reach the trailhead, walk east toward, then past, the restrooms to the metal gate.

Trail Details: From the metal gate, walk 0.1 mile to the viewing platform. The platform overlooks the former Alviso Marina (now vegetated), Salt Pond A12, and New Chicago Marsh across the Union Pacific Railroad track. From the platform, turn left (west) away from the railroad track. As you head toward Alviso Slough, stop and read the interpretive panels at the Marina to get an orientation of the area including the layout of the salt pond system. Soras and Virginia rails are present in the vegetated marina all year except the summer, and marsh wrens are present year-round.

Pelicans and gulls roost on a levee. *Photo: Pelican Media*

At 1.4 miles you reach the levee separating Pond A12 and Pond A11. This upper end of Alviso Slough is dominated by fresh/brackish vegetation such as cattails and bulrush. The slough has nesting marsh wrens, common yellowthroats and black-crowned night-herons. The trail itself has mourning doves and wintering savanna sparrows. The managed salt ponds provide habitat for numerous waterbirds including double-crested cormorants, pied-billed and Clark's grebes, Forster's (more common in spring) and Caspian terns and American white and brown pelicans.

At the next levee junction, the levee separating Ponds A11 and A10 often serves as resting areas for great and snowy egrets, great blue herons, gulls, terns, ducks, and pelicans. Double-crested cormorants and California gulls would often nest there in the spring.

Pond A9 is reached 3.7 miles from the viewing platform. Pond A9 has the largest number of wintering ducks of any of the 53 salt ponds in South San Francisco Bay; sometimes exceeding 10,000 individuals. Northern shoveler, bufflehead, ruddy duck, scaup, and gadwall are the most common. At the four-mile mark, you see the A9 water control structure, the first of three on the trail. These structures allow water movement between the pond and the slough during low and high tides, thereby decreasing the salinity levels and increasing food prey. Before this structure was built in 2005, this pond had been part of Cargill's salt production process for 60 years. Since its installation, duck use has increased by 100%, and shorebird use has increased by more than 100%.

The ponds you encounter for the next three miles (A14 and A15) also have waterfowl and fish-eating birds. At low tides, shorebirds such as marbled godwits, long-billed curlews, sandpipers, and dowitchers can be seen foraging in Coyote Creek over the vegetated marsh. The tidal marsh has nesting northern harriers and song sparrows. As you approach the railroad track, distant views of the ghost town Drawbridge can be seen.

Pond A13 comes into view two miles later. This pond, along with Pond A12 and A14 are managed for higher salinities so brine shrimp and brine flies can thrive. These critters are essential prey for shrimp/fly-loving species. As a result, Ponds A12, A13, and A15 are best for sighting pied-billed and eared grebes, and Wilson's and red-necked phalaropes.

Mile seven brings you to the legal crossing of the railroad track. Crossing the track will connect you to the Mallard Slough Trail and to the Environmental Education Center. See the fall 2007 issue of *Tideline* for a description of the Mallard Slough Trail.

The shallow ponds between the railroad track and the salt ponds provide feeding habitat for short legged species in migration/winter such as semi-palmated plovers, least and western sandpipers, and year-around species such as American avocets, black-necked stilts and the occasional snowy plover. These ponds sometimes support large numbers of gulls including an occasional rare species such as lesser black-backed gull. Mile nine brings you back to the trailhead and the Alviso Marina viewing platform, picnic tables and restrooms.

For More information on trails, contact the Don Edwards San Francisco Bay National Wildlife Refuge Visitor Center Tuesday through Sunday 10:00 a.m. – 5:00 p.m. or call 510-792-0222 ext. 43.

by Ingrid Frisk
Visitor Services Intern

The Year 2007 has yet again been a busy one for the San Francisco Bay National Wildlife Refuge Complex. Here are just a few highlights of each refuge's accomplishments.

Antioch Dunes National Wildlife Refuge

At Antioch Dunes, monthly docent walks continue to be offered on the second Saturday of each month. Anyone who would like to attend can meet the docents at the Stamm Unit gate at 10 am. Call 707-769-4200 for directions. New signs will also be posted at Antioch Dunes to educate and bring about awareness to the public about fire prevention.

The refuge will be conducting an experiment on removal methods of non-native grasses and vegetation. This winter, cows will be allowed to graze on 10 acres of land with the hopes of reducing non-native species cover. An additional five acres will be used as the control. The goal is to reduce cover of non-native species by as much as 30% so that other vegetation removal methods and plantings are more successful. The refuge will continue to plant Contra Costa wallflower and Antioch Dunes evening primrose, both endangered species, along with other native plants. Volunteers assisted with these plantings in late fall and winter.

Propagation of the Lange's metal-mark butterfly also began for the refuge. Nine female butterflies were captured and almost 400 eggs laid in the captive breeding program. Researchers have plans to release the offspring at Antioch Dunes NWR in 2009.

Don Edwards SF Bay National Wildlife Refuge

The 1,400-acre restoration of Bair Island has started this year and shows promising results. Fill material has been brought into the former commercial salt pond to speed up the restoration process. This fill material will raise the level of the ground, which has subsided considerably, so native plants can establish after levees are breached. Plans are being formulated for summer 2008 to bring in dredge material from the Redwood Crest Shipping channel. This is exciting news because it is the first beneficial reuse of dredge material in the South Bay. It benefits Bair Island, the shipping companies, and most importantly the surrounding environment.

In March 2006, three ponds that are part of the South Bay Salt Pond Restoration Project had their levees breached (A19, A20, A21). This allowed tidal flows to enter, bringing in sediments and permitting the ponds to restore naturally. Survey results since have proved to show a tremendous increase of shorebirds and sea birds. Another encouraging sign is that there is more sedimentation in the South Bay than expected, showing promising results for the future.

In October, Meadowsweet Dairy, a group of artists who converts materials found on-site into functional wildlife habitat sculptures, completed the bat silo project. Meadowsweet Dairy converted a 1917 silo into habitat for bats, swallows and swifts.

Ellicott Slough National Wildlife Refuge

Ellicott Slough has been focusing on diversifying its native plant and animal species. Students from the Renaissance High School located in La Selva Beach in Monterey County, assisted in native plant restoration efforts at Ellicott Slough NWR. They planted coast live oak and coffeeberry seedlings in an area that was previously cleared of non-native eucalyptus growth. The students also participated in wildlife surveys to document amphibian and reptile diversity. Additionally, the refuge is working on forming new partnerships with researchers and land managers specializing in native plant restoration within the Watsonville Slough Watershed.

Farallon National Wildlife Refuge

Countless curious cormorants and many mating murres have been asking all summer... What is going on "Behind the Wall??" Between fall 2006 and March 2007 there was a flurry of human activity in the rocky area above Sea Lion Cove on

the northwest part of Southeast Farallon Island. Loads of rocks and concrete – rubble from past construction projects that was covering up important bird nesting habitat – were being transported across the island. At first, activities drew little attention, except from the Western gulls who like to squawk and flap whenever something new happens in their territories. The rocks were stealthily moved with the aid of the island's new electric cart – a quiet, pollution-free power-assisted wheelbarrow. But then one day an observation blind, fashioned from wood and camouflaged with copper shingles that instantly took on the island's green tones when exposed to air, and an attractive stone wall stood in the "gap" where once there was an ocean view. People walking along the trail to North Landing could no longer admire

the seascape, but this loss was viewed as a good thing by all island residents: humans and birds alike. That's because this new habitat feature shields "prospecting" murres and cormorants looking for a place to nest away from human disturbance.

This habitat improvement could not have been constructed without the combined efforts of the following partners: Command Oil Spill Restoration Project Trustee Agencies, Meadowsweet Dairy, PRBO Conservation Science, and Charles Whitefield.

Waters around Farallon National Wildlife Refuge are currently being considered for additional protection under the Marine Life Protection Act (MLPA). This act mandates that the state design and manage an improved network of marine protected areas to, among other things, protect marine life and habitats, marine ecosystems, and marine natural heritage. This highly involved process is bringing together commercial and recreational fishermen, conservation groups, marine scientists, agencies, and many others to help restore and protect the state's marine ecosystem. To learn more and become involved in this fast-moving process, visit the MLPA website at **http://www.dfg.ca.gov/mlpa/**.

Marin Islands and San Pablo Bay National Wildlife Refuge

On Marin Islands National Wildlife Refuge, Save The Bay has continued their work with the refuge staff to remove non-native vegetation and provide environmental education to the public on a monthly basis.

The San Pablo Bay National Wildlife Refuge may be expanding. The approved refuge boundary is being expanded by 1,200 acres to include lands the San Pablo Bay NWR office building is located, and adjacent tidelands. Refuges may acquire new lands only if it is approved by the Regional or Washington, D.C. Office, and if the land comes up for sale. The refuge is also in the process of developing a Comprehensive Conservation Plan that will guide management actions for the next 15 years. To accomplish its educational and biological goals, the refuge will develop and integrate new programs. Biological programs will focus on establishing transition zones between tidelands and uplands. The refuge greenhouse will be volunteer-based and used as an educational tool while providing plants to restore and enhance marshlands.

Salinas River National Wildlife Refuge

Good news from the Monterey Bay Area, which includes the Salinas River NWR. Records show that the federally threatened snowy plover breeding season was fairly successful. According to PRBO Conservation Science who conducted the surveys, there were a total of 229 total fledged chicks on the beaches and salt ponds.

Also exciting news, visitors should be on the lookout for new information kiosks with displays of native flora and fauna and maps. The refuge has worked on improving the visitor experience by providing general information about the refuge and waterfowl hunting regulations on-site.

Don Edwards San Francisco Bay National Wildlife Refuge
Environmental Education Center in Alviso presents…

Live Bird Program:

HOLIDAY FOR THE BIRDS!

Saturday, December 1st in Alviso

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

Make some new feathered friends at our holiday season live bird program. Sulphur Creek Nature Center is bringing an interesting and diverse assortment of live birds for us to get to know better. Find out what you can do to help wild birds and wildlife in your watershed. Make a bird treat to take home. Please note: the bird treat is made using peanut butter. Suitable for all ages.

Programs are FREE –
RESERVATIONS are REQUIRED.
Call 408.262.5513 ext. 102.

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 21, 2007 and October 18, 2007. These gifts will be used for capital, environmental education, habitat restoration, and interpretive programs at the Don Edwards San Francisco Bay National Wildlife Refuge.

Sponsor

Laurel Przybylski

Participant

Kim Brink, Frank & Janice Delfino, Donald R & Margaret Ermery, Justin Kitzes, and Philip A Lathrap

Supporter

Karen McCreddin

Family

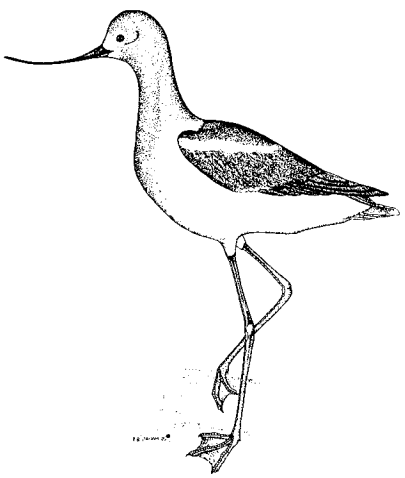
Alan & Cheryl Abel, R\P.L. & Helen E Fan, Melanie Ito, Charles D Carroll, Particia G DeVlieg, David Loeb, John Lucas, T Charles & Meredith Moore, and Michael Murphy & Joanna Wong

Individual

Laura Avery, Marie Channa, Loring G Dales, Eleanor S Hansen, Ken Himes, Shirley Mae Skaredoff, Sheila Sousa, Haven Thompson, William K Warburton, Marge E Wood, Rose Wright, and Stella Yang

Senior/Student

Nancy I Andersen, Willard S Fine, Marilyn Fowler, Andrea Kewell, Susan V Lee, James G Miguelgorry, Mansurali G Nurmuhammad, S Jane Ryono, Todd C Smith, Mary Elizabeth Stone, Bernice Walton, Carolyn Whitney, and Eric D Winch



Help Us Help the Refuge

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

For a gift membership, call 510-792-0222 ext. 40.

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

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

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

☐ Check ☐ Visa or MasterCard # _____ Exp. Date _____

Signature _____

Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ ***Thank you for your support!***

SF Bay NWR Complex Employee Wins National Award

Fran McTamaney, long-time Environmental Education Specialist for the San Francisco Bay NWR Complex, has been recognized with the 2007 *Sense of Wonder* Award. The award acknowledges Fran's key role introducing children to nature and helping chart the course of environmental education within the U.S. Fish & Wildlife Service. Although Fran retired at the end of September, the programs, activities, manuals, and training courses that she developed throughout her career will continue to be enjoyed by children and teachers for many years to come.

Presented by the U.S. Fish & Wildlife Service at the National Association for Interpretation conference in November, the *Sense of Wonder* award is the agency's highest honor for achievement in environmental education and interpretation. The award takes its name from a book by the great conservationist and former U.S. Fish & Wildlife Service employee Rachel Carson, who urged adults to help children develop a "sense of wonder" in the natural world that would continue to grow for generations.

Congratulations Fran, and Thank You!

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

12th Annual

San Francisco Bay Flyway Festival

Friday, February 1, 5pm - 9pm
Saturday, February 2, 9am - 4pm • Sunday, February 3, 9am - 3pm

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

Log on to www.fws/gov/sfbayrefuges for a schedule of San Pablo Bay Refuge events in January
For a Flyway Festival brochure, call (707) 649-9464 or www.SFBayFlywayFestival.com

Winter Activity Schedule

December

Saturday, December 1

Habitat Restoration Work Party

Meet at flagpole in Fremont
1:00 p.m. – 4:00 p.m.

Come work with our active group of volunteers as we manage habitats for wildlife. Work projects include pulling weeds, planting, and helping in our Native Plant Nursery. Great opportunity for students to earn Community Service hours. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Beginning Bird Photography Workshop

Visitor Center Auditorium, Fremont
2:00 p.m. – 4:30 p.m.

Come learn the basics in bird photography! 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! This is a beginning bird photography workshop that will help you get the most out of your point-and-shoot camera. We will discuss ideal sighting and photo taking conditions, lighting, composition and equipment. We will also have a slide show to familiarize you with shorebirds at the refuge. Our discussion will be followed by an easy, late afternoon/sunset walk to several locations where we will spot birds and stop to take photos. This workshop and walk will conclude at 4:30 p.m., but you are welcome to stay longer to catch the last rays of the sunset. Please be sure to bring your binoculars and/or digital or film camera, warm clothing, and a comfortable pair of walking shoes. Space is limited to the first 30 people. RESERVATIONS REQUIRED. Please call 510-792-0222 ext. 43 to reserve a spot.

*Holiday for the Birds!

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

Make new feathered friends at our holiday season LIVE BIRD program. Sulphur Creek Nature Center is bringing live birds for us to get to know better. Find out what you can do to help wild birds and other wildlife in your watershed. Make a winter bird treat to take home. Please note: the bird treat contains peanut butter. Suitable for all ages. RESERVATIONS REQUIRED, space is limited. Call Lindy at 408-262-5513 ext. 102.

Sunday, December 2

Extended Wetland Expedition

Environmental Education Center, Alviso
1:00 p.m. – 4:00 p.m.

Come join us as we follow the Artesian Slough out to Coyote Creek. We will be taking a 1.5 mile walk on the salt pond levee trails to explore wetland alternation. Along the way we will develop scientific questions and test hypotheses about human impacts on wetlands. Recommended for ages 9 and up. Program may be canceled due to weather. Reservations required. Call 408-262-5513.

Saturday, December 8

*Adult Beginning Birdwatching

Environmental Education Center, Alviso
9:00 a.m. – 11:00 a.m.

Can you tell an avocet from a black-necked stilt? If not, join birding enthusiast Ceal Craig for a beginning bird watching program and get to know the most common refuge visitors. Start with a slide show to learn how to recognize the regulars, and then take a walk with Ceal to try your new skills. Program intended for adults. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Exploring the Dunes

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

Did you know there's a National Wildlife Refuge in Antioch? 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.

*Drawbridge

Environmental Education Center, Alviso
12:00 p.m. – 1:00 p.m.

There's a ghost town in San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two fisted rowdies? Enjoy a slide show program, led by Ceal Craig. RESERVATIONS ARE REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Habitat Restoration Work Party

Meet at flagpole in Fremont
10:30 a.m. - 1:30 p.m.

Come work with our active group of volunteers as we manage habitats for wildlife. Work projects include pulling weeds, planting, and helping in our Native Plant Nursery. Great opportunity for students to earn Community Service hours. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

*Looking for New Arrivals!

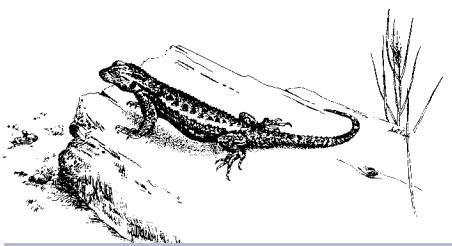
Environmental Education Center, Alviso
3:00 p.m. – 4:00 p.m.

Come out for an invigorating stroll at the refuge as we look for new arrivals. Find out what critters are enjoying the refuge during this time of year. What does winter look like in a salt pond? In a salt marsh? Look for seasonal changes in our wetland habitats at the bottom of the bay. Fun for the whole family. Suitable for all ages. Dress warmly as it can get breezy. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

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 observation deck. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.



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.

***Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.**
Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Winter Activity Schedule

Passing the Winter Nights

Visitor Center Auditorium, Fremont
5:45 p.m. – 7:00 p.m.

Join us as we welcome winter by telling stories, sharing fun facts and learning about the winter night sky. We will meet at the Visitor Center for a brief introduction, and if weather permits, go outside for night sky viewing. We will share naked eye viewing techniques such as star hopping to learn more about the winter constellations in this fun family event. Dress warmly and bring a flashlight. Please call 510-792-0222 ext. 43 for reservations. Led by Tia Glagolev.

Sunday, December 9

*Avian Antics

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

Join us at the refuge as we explore the trails and attend a low tide feast. Learn some bird trivia like why some birds eat their own feathers or which refuge bird finds a mate for life? Bring your own binoculars, or borrow one of ours! This is a quiet walk so the birds don't fly away. Reservations required. Call 408-262-5513.

Saturday, December 15

Habitat Restoration Work Party

Meet at flagpole in Fremont
1:00 p.m. – 4:00 p.m.

Come work with our active group of volunteers as we manage habitats for wildlife. Work projects include pulling weeds, planting, and helping in our Native Plant Nursery. Great opportunity for students to earn Community Service hours. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Wetland Migration Sensation!

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

Find out what it's like for birds to migrate. Come learn about the Pacific Flyway and how the habitats here at the refuge are important for migratory birds. Then play a fun game where you simulate migrating birds that travel long distances. Recommended for ages 7 and up. RESERVATIONS REQUIRED. Please call Lindy at 408-262-5513 ext. 102.

Sunday, December 16

Family Bird Walk

Visitor Center, Fremont
3:00 p.m. - 5:00 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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Led by Bill and Sharon Purcell. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Sunday, December 23

Introduction to Ducks

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

Thousands of ducks winter in the San Francisco Bay every year. View a short slide show 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. Led by Carmen Minch.

January

Saturday, January 5

Family Bird Walk

Visitor Center Auditorium, Fremont
10:00 a.m. - 12:00 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. Learn about the salt marsh habitat along the way. A limited number of binoculars are available to borrow. Led by Bill and Sharon Purcell. Recommended for children ages 5-10. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Webelos Naturalist Program

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

Calling all Webelos of Santa Clara County! Do you need to earn a naturalist badge? We've got a program just for you. Learn about birds, migration, flyways, food chains, human impacts, and the importance of wetlands. Then take a walk and use our binoculars to spot birds in the wild. Program will go, rain or shine. Space is limited. RESERVATIONS REQUIRED. **Calls for reservations begin Tuesday, November 27th at 9:00 a.m. No Exceptions.** Call Lindy at 408-262-5513 ext. 102.

Sunday, January 6

*Critter Café

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

Water is pretty boring stuff, right? No way! Come tal[illegible] the tiny, wiggly, [illegible] in San Francisco[illegible]s. Learn about m[illegible]on – the tasty trea[illegible]t our five-star marsh 'cafes' at the refuge. Recommended for ages 6 and up. Reservations required. Call 408-262-5513.

Cancelled

Saturday, January 12

Exploring the Dunes

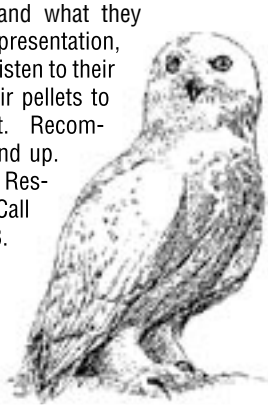
Antioch Dunes NWR, Antioch
10:00 a.m. – 11:00 a.m.

Did you know there's a National Wildlife Refuge in Antioch? 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.

Exploring Owls

Visitor Center Auditorium, Fremont
1:00 p.m. – 3:00 p.m.

Owls have captivated human imaginations for centuries. Curious about how they hunt, how they see and hear, and what they eat? Come listen to a presentation, view owl body parts, listen to their calls, and dissect their pellets to see what they eat. Recommended for ages 7 and up. Led by Paul Bridges. Reservations required. Call 510-792-0222 ext. 43.



***Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.**
Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Winter Activity Schedule

Sunday, January 13

*Salinity Sleuths

Environmental Education Center, Alviso
2:30 p.m. – 4:00 p.m.

Step into the shoes of a scientist and strap on our field detective packs for a hands-on investigation where we will collect water samples, use plant clues, and do some sleuthing around to uncover how salty the water is. You will need to bring along keen senses of taste, smell and sight to determine which plants and animals live in the refuge's salty habitats! Reservations required. Call 408-262-5513.

Saturday, January 19

Girl Scout Try-it Eco-Explorer Patch

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

Calling all Brownies of Santa Clara County! Do you want to earn and Eco-Explorer patch? We've got the program just for you. Come to the wildlife refuge and learn about habitats, food chains, and how you can help wildlife. Then take a walk to explore the habitats at the bottom of the bay. Dress warmly. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

*Quackers and Honkers

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

Enjoy a brief slide show about our migratory ducks and geese. Then join us in a leisurely walk to see which migrants made it to the refuge so far. Dress warmly. Open to all ages. Led by Ed Kantack. RESERVATIONS REQUIRED. Please call Lindy at 408-262-5513 ext. 102.

Volunteer Orientation

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

Have you been thinking about volunteering? Wonder if there's something you can do to help your local wildlife refuge? Come find out at this inform olunteers staff o tive Plant Nurse d school field t eds; drive biolog nize files. See if there's something that's right for you. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43.

Cancelled

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 observation deck. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Saturday, January 26

Puppet Show

Visitor Center Auditorium, Fremont
3:00 p.m

Meet som earn about habitats durin w. All ages welcome. Puppet show geared toward ages 3-5.

Cancelled

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 510-792-0222 ext. 43 beginning November 27 for reservations.** Led by June Smith.

*Adult Beginning Birdwatching

Environmental Education Center, Alviso
2:30 p.m. – 4:00 p.m.

Can you tell an avocet from a black-necked stilt? If not, join birding enthusiast Ceal Craig for a beginning bird watching program and get to know the most common refuge visitors. Start with a slide show inside to learn how to recognize the regulars, then borrow our binoculars and take a walk with Ceal to try your new skills. Program intended for adults. RESERVATIONS REQUIRED. Call Lindy 408-262-5513 ext. 102.

*Night Sky Party!

Environmental Education Center, Alviso
5:30 p.m. - 7:30 p.m.

Meet the stars of winter. Join amateur astronomer Bob Havner as we learn about constellations. Make a star chart, and then venture outside to view the night sky through a telescope. Then warm up with hot chocolate. Bring your own binoculars or spotting scopes if you have them. Dress warmly. Fun for the whole family! RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext 102.

February

Saturday, February 2

Community Service

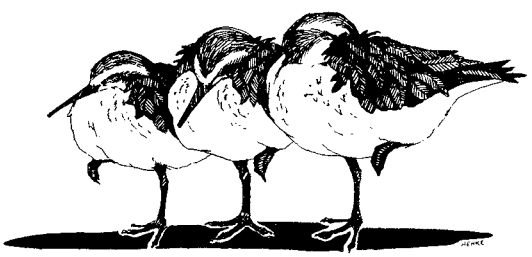
Environmental Education Center, Alviso
10:00 a.m. – 12:00 p.m.

Do you need to fulfill community service requirements? Come help remove invasive non-native plants from our chemical-free demonstration gardens. Bring your own gloves or borrow a pair of ours. Tools and drinking water provided. Dress in layers and long pants. Be prepared to get dirty and wet. Recommended for ages 9 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

*All About Owls!

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

Everything you wanted to know about owls and more. Come join owl enthusiast Paul Bridges as he shares his knowledge about owls with a talk and slide show. Want to know what owls eat? Stay for the exciting experience of dissecting an owl pellet. See if you can put together the puzzle of bones and find your own answer. Recommended for ages 7 and up. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.



***Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.**
Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Winter Activity Schedule

Sunday, February 3

*Habitat Hike

Environmental Education Center, Alviso
2:00 p.m. – 3:30 p.m.

Do you enjoy exploring nature? Do you find yourself curious about where mice sleep or how birds stay dry in the rain? If so, then you may be a habitat homonid! What is a habitat hominid? It's a person who loves learning about where local animals and plants live. Come take a walk and explore the habitats at the refuge. Along the way we will learn about wetland and upland habitats that have been human-altered. We will observe and identify plants, birds, and other animals we see on this short and easy trek. This program is wheelchair and stroller accessible. Recommended for all ages. Reservations required. Call 408-262-5513.

A Ghost Town in SF Bay?

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

That's right! On Station Island nestled in the salt marshes of south San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful community of nature lovers, or a rip-roaring gang of two-fisted rowdies? Excellent slide show and presentation. Led by Pat Anthony.

Saturday, February 9

Exploring the Dunes

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

Did you know there's a National Wildlife Refuge in Antioch? 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.

Puppet Show

Visitor Center Auditorium. Fremont
10:30

Cancelled

Meet s[illegible]arn about habitats du[illegible]v. All ages welcome. [illegible]d ages 3-5.

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 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 observation deck. Not suitable for young children. RESERVATIONS REQUIRED. Call 510-792-0222 ext. 43. Led by Mary and Gene Bobik.

Sunday, February 10

Where Does All the Water Go?

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

Are you curious about where wastewater goes after we flush, rinse, wash, and shower? Come enjoy a presentation about how the San Jose/ Santa Clara Water Pollution Control Plant cleans wastewater. After the presentation there will be a short tour that will get participants up close and personal with cleaned wastewater and the refuge habitats involved. Appropriate for ages 10 and up. Reservations required. Call 408-262-5513.

Saturday, February 16

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 510-792-0222 ext. 43 beginning November 27 for reservations.** Led by June Smith.

Just for Tots: February Discoveries!

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

Come explore who eats whom in the salt marsh! Introduce your wee folk, ages 3-6, to the unique marsh habitat through interactive, hands-on activities. They will experience the marsh first-hand with puppets, a craft, and a short walk. Children must be accompanied by an adult. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Water Water Everywhere

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

Where does the water come from and where does it go? Learn about the water cycle and watersheds. Build a model of a watershed and see if you can predict where the water will go. Recommended for ages 7 and up. Led by Ed Kantack. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Saturday, February 23

*Drawbridge

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

There's a ghost town in San Francisco Bay? That's right! Nestled on an island in the salt marshes of South San Francisco Bay, the town of Drawbridge once boomed. Was it a quiet, peaceful town full of nature lovers, or a rip-roaring town full of two fisted rowdies? Enjoy a slide show program led by Ceal Craig. RESERVATIONS REQUIRED. Call Lindy at 408-262-5513 ext. 102.

Webelos Naturalist Program

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

Calling all Webelos of Santa Clara County! Do you need to earn a naturalist badge? We've got a program just for you. Learn about birds, migration, flyways, food chains, human impacts, and the importance of wetlands. Then take a walk and use our binoculars to spot birds in the wild. Program will go, rain or shine. Space is limited. RESERVATIONS REQUIRED. **Calls for reservations begin Tuesday, November 27th at 9:00 a.m. No Exceptions.** Call Lindy at 408-262-5513 ext. 102.

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.

***Trails are generally level. Surface and trail conditions vary. Please call for accessibility information.**
Visitor Center, 1 Marshlands Road, Fremont – (510) 792-0222 • Environmental Education Center, 1751 Grand Blvd, Alviso – (408) 262-5513

Field Trips to the Refuge

General Field Trip Program Information

FREE field trip programs are offered at two sites at the Don Edwards San Francisco Bay National Wildlife Refuge. The Wetland Round-Up field trip program is offered at the Newark Slough Learning Center in Fremont. The Trekking the Refuge field trip program may also be available this spring in Fremont. Wetland Round-Up and Slow the Flow 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 students. All programs have been correlated to the appropriate State of California Education Standards.

Educators and adult leaders design and conduct their own field trips after attending a Field Trip Orientation Workshop. Adult volunteers must be recruited to lead the activities at the different learning stations and to chaperone the rotation of student groups. We provide easy to follow "scripts" for each station, but both "leaders" and "chaperones" are strongly encouraged to attend a workshop. It is our policy that lead educators must attend a workshop 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 Roundup

Investigate creatures of the mud flats, plankton and other creatures in the slough, and the pickleweed in the salt marsh. This field trip is designed for grades K-6, for up to 65 students. Wetland Roundup is offered Tuesday-Friday from February 5 - June 13, 2008.

Trekking the Refuge Field Trip

Trek the one-mile Tidelands Trail and learn about the natural history of the refuge. Explore pickleweed in the salt marsh, brine shrimp in the salt pond, and creatures in the slough in three different activities. Available only at the Newark Slough Learning Center in Fremont, Trekking the Refuge Field Trip is designed for grades 3-6, and will accommodate up to 36 students. This program may be offered this spring after maintenance of the salt ponds is complete. Please call for further information.

Reservations for spring field trips begin on Tuesday, December 4th between 4:00 p.m. and 5:00 p.m. Call 510-792-0222 ext. 0 to make a reservation in Fremont.

For more information or to schedule a field trip after the initial call-in date, call the Environmental Education Intern at 510-792-0222 ext. 42.

Field Trip Orientation Workshop Dates at the Learning Center in Fremont

Call the Environmental Education Intern at 510-792-0222 ext. 42 to attend an orientation.

Wetland Round-Up 4:00 p.m. - 7:30 p.m.

Tuesday, January 29
Wednesday, February 20
Thursday, March 13
Tuesday, April 8

Trekking the Refuge Field Trip Orientations

To Be Announced. Call 510-792-0222 ext. 42 for further information.

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 program is designed for up to 65 students in grades K-6. Wetland Round-Up is offered Monday - Thursday from February 5th - June 13, 2008.

Reservations for spring field trips begin on Tuesday, December 4th between 4:00 p.m. and 5:00 p.m. Call 408-262-5513 on this date to make a reservation in Alviso.

For more information or to schedule a field trip after the initial call-in date, call the Environmental Education Intern at 408-262-5513 ext. 103.

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

Call the Environmental Education Intern at 408-262-5513 ext. 103 to attend an orientation.

Wetland Round-Up 4:00 p.m. - 7:30 p.m.

Wednesday, January 30
Thursday, March 6
Thursday, April 3
Monday, April 21
Wednesday, May 14

Please note: The cutoff date to make a workshop 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 ef-

Field Trips to the Refuge

forts 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.

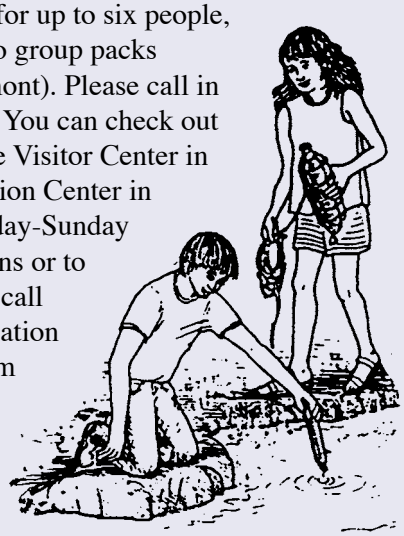
5th and 6th Grades: We offer a combined classroom presentation and an all day hands-on field trip at the refuge.

7th - 12th Grades: We offer classroom presentations and/or a field trip at the refuge.

Educators are encouraged to contact us to discuss options for customizing field trips and presentation activities and schedules. Slow the Flow Programs are available throughout the year in Alviso. **Reservations for the Slow the Flow program are on a first-come basis.** Call the Slow the Flow coordinator at 408-262-5513 ext. 104 for more information, or to schedule a field trip or presentation for the winter or spring.

Free Discovery Packs available at the Visitor Center and Environmental Education Center!

Explore the salt marshes, salt ponds, and the birds of the refuge with your family or small youth group! The Discovery Pack includes an activity booklet, and equipment such as dip nets, magnifying lenses and bug boxes that you will need to take a close look at the salt marsh plants, and the birds. The back pack is suitable for up to six people, ages kindergarten - adults. There are also group packs available for 12-24 people (only in Fremont). Please call in advance if you would like a group pack. You can check out the Discovery Packs free of charge at the Visitor Center in Fremont or at the Environmental Education Center in Alviso. The Visitor Center is open Tuesday-Sunday from 10:00 a.m. - 5:00 p.m. For questions or to reserve a group pack in Fremont, please call 510-792-0222. 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.



TIDELINE

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

Volume 28, Number 4

Editor: ..... Carmen Minch

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

San Francisco Bay National Wildlife Refuge Complex

Founded in 1974 and administered by the U.S. Fish and Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge exists to preserve wildlife habitat, protect threatened and endangered species, protect migratory birds, and provide opportunities for nature study. Six additional refuges are managed from the headquarters located in Fremont: San Pablo Bay NWR, Antioch Dunes NWR, Salinas River NWR, Ellicott Slough NWR, Marin Islands NWR, and Farallon NWR.

Project Leader: ..... Mendel Stewart

Deputy Project Leader: ..... John Bradley

Don Edwards San Francisco Bay Refuge Manager: ..... Clyde Morris

Don Edwards Warm Springs Unit Manager: ..... Ivette Loredo

Don Edwards Refuge Operations Specialist: ..... Eric Mruz

Farallon Refuge Manager: ..... Joelle Buffa

Farallon Refuge Operations Specialist: .Zach Coffman

North Bay Refuges Manager: ..... Christy Smith

North Bay Wildlife Specialist: ..... Louis Terrazas

South Bay Refuges Manager: ..... Diane Kodama

Refuge Planner: ..... Winnie Chan

Chief of Visitor Services: ..... Karla Tanner

Outdoor Recreation Planner: ..... Carmen Minch

Volunteer Coordinator: ..... Laurie McEwen

Environmental Education Specialists: ..... Genie Moore, Tia Glagolev

Law Enforcement Officers: ..... Walter Duran

Biologists: ..... Joelle Buffa, Joy Albertson, Giselle Downard, Rachel Hurt, Gerry McChesney, Susan Euing

Administrative Staff: ..... Lucinda Ballard, Ellen Tong, Patricia Compton

Maintenance Staff: ..... Larry Wade, Juan Flores, Michael Springman, James Griffin, Calvin Sahara

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.

Board of Directors

President: ..... Christopher Kitting

Vice President: ..... Karen Natoli Maxwell

Treasurer: ..... Bart Anderson

Secretary: ..... Ceal Craig

Directors: ..... Sue Ten Eyck, David Reinsche, Terry Smith, and Varon Smith

Staff

Interpretive Specialist: ..... Lindy Nice

Education Specialist: ..... Tina Gonterman

Program Administrator: ..... Sue Ten Eyck

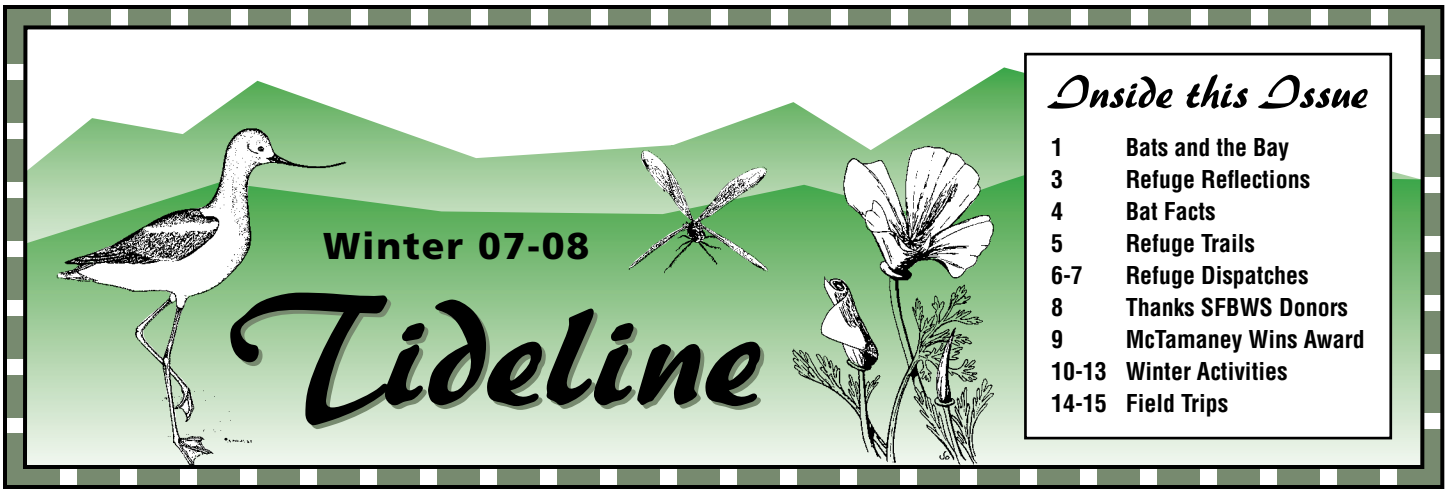
Tideline is On-Line

Visit our web site, which features past issues of *Tideline*, at http://www.fws.gov/desfbay

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DON EDWARDS SAN FRANCISCO BAY
NATIONAL WILDLIFE REFUGE
9500 Thornton Ave
Newark, CA 94560

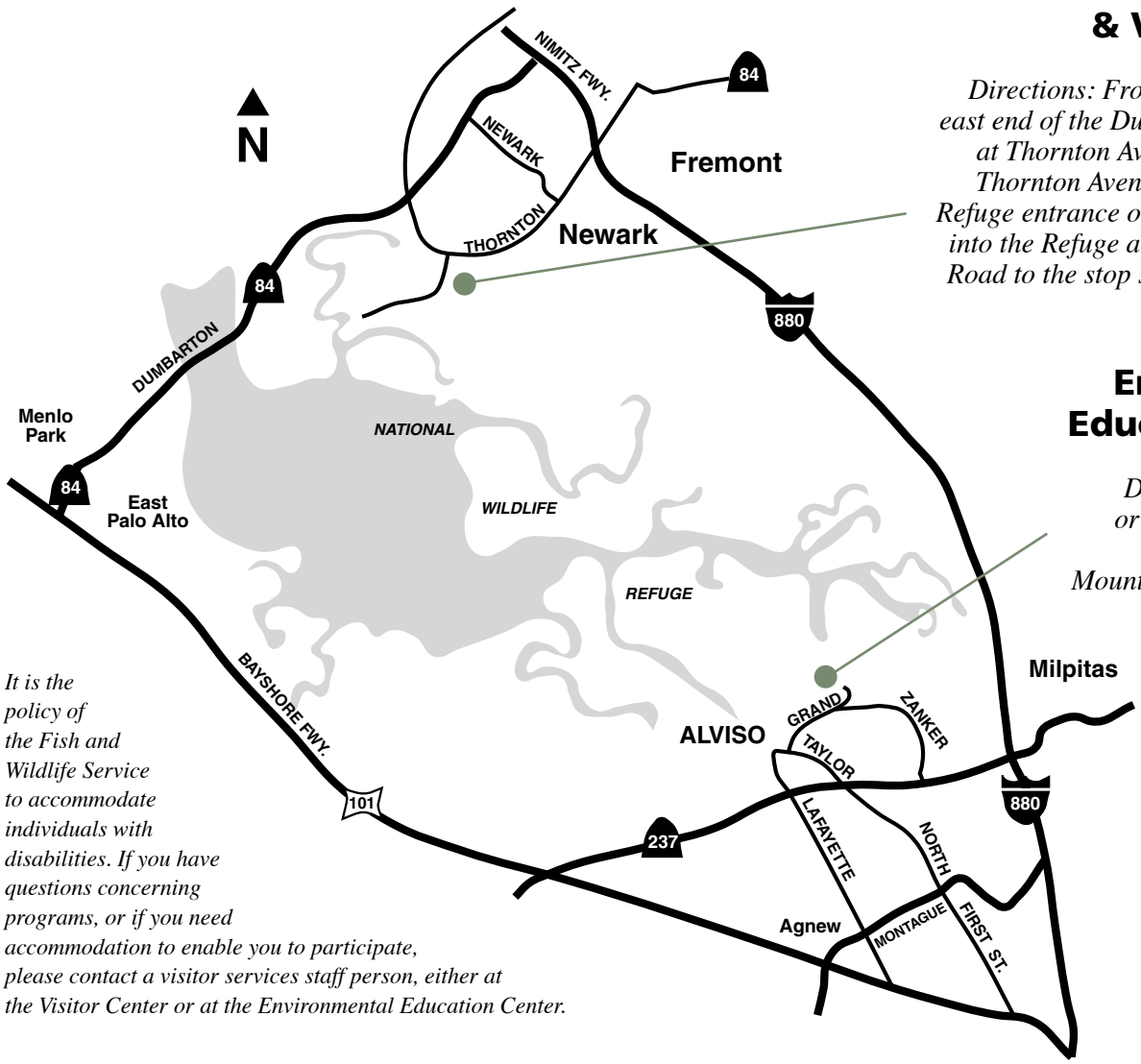
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

FIRST-CLASS MAIL
POSTAGE & FEES PAID
U.S. Fish & Wildlife Service
Permit No. G-77



Inside this Issue

1	Bats and the Bay
3	Refuge Reflections
4	Bat Facts
5	Refuge Trails
6-7	Refuge Dispatches
8	Thanks SFBWS Donors
9	McTamaney Wins Award
10-13	Winter Activities
14-15	Field Trips



Headquarters & Visitor Center

(510) 792-0222

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.