

Public Use at San Francisco Bay National Wildlife Refuge



Annual Narrative 1993

*Education, interpretation, volunteers,
and other wildlife-oriented programs for people*

**ANNUAL NARRATIVE
PUBLIC USE SECTIONS**

E.2. Youth Programs	1
E.4. Volunteer Programs	1
H.1. General Public Use	7
H.2. Field Trips (Outdoor Classrooms) - Students	7
H.3. Environmental Education - Teachers Educational Resources Educator Workshops Educational Courses and Programs	18
H.4. Interpretive Trails	21
H.5. Interpretive Routes (Nothing to Report)	21
H.6. Interpretive Exhibits and Demonstrations	22
H.7. Other Interpretive Programs	28
H.9. Fishing	34
H.10. Trapping (Nothing to Report)	34
H.11. Wildlife Observation	34
H.12. Other Wildlife Oriented Recreation (Nothing to Report)	35
H.13. Camping (Nothing to Report)	35
H.14. Picnicking (Nothing to Report)	35
H.15. Off-Road Vehicles (Nothing to Report)	35
H.16. Other Non-Wildlife Oriented Recreation	35
H.18. Cooperating Associations	35
Public Use Staff Photo	38

1993 ANNUAL NARRATIVE PUBLIC USE SECTIONS

E.2. Youth Programs, Boy Scouts and Girl Scouts

During 1993, the Refuge had 4 employees involved with Scouting. A total of 735 hours, consisting of 195 hours of duty time and 540 hours of volunteer time, were logged. We cooperated and worked with the local girl scout council again this year. A total of 90 staff hours and 80 volunteer hours were logged, mostly in the late summer.

The Refuge continued to sponsor a boy scout troop, a cub scout pack and an explorer post. Due to lack of interest among the members of the Refuge's Conservation - Natural Resource Explorer Post, as well as a shortage of staff time and volunteer assistance, the post was disbanded in August. The boy scout troop and cub pack continued to do very well.

Boy Scout Troop 272 moved the old Native Plant Nursery to a new site and reconstructed it in a new expanded format. Besides moving several thousand potted plants, the scouts constructed a shade arbor, laid down wood chips and built a bench for the volunteers.

Two members of Troop 272 completed public service projects on the Refuge in partial fulfillment of the requirements for their Eagle Scout badges. A third Eagle Scout project produced an interpretive display for the Environmental Education Center. This was an A-frame panel board that had questions on conserving water on one side and hazardous waste disposal on the other. Green or red lights indicate the right and wrong answers to the questions.

Staff and volunteers continued to meet, upon request, with girl and boy scout troops during after-school and weekend visits to the Refuge. Usually the troops were fulfilling requirements for badges and the staff or volunteers presented programs based on what the troop leader requested.

E.4. Volunteer Program

Once again, volunteers were vital to the continued success of many of the Refuge's programs. Volunteers staffed the Visitor Center 95% of the time, patrolled the Refuge trails and fishing piers, and presented 98% of the weekend interpretive programs, including walks, slide shows and tours. Volunteers provided staff with administrative help in the office and also assisted with the many maintenance projects around the Refuge. Many resource management projects, like clean-ups at Salinas River NWR utilized volunteers.

Total hours contributed by 595 registered volunteers during the year was 27,548, which at a minimum \$ 4.25 per hour wage saved the government \$ 123,966. This included Refuge volunteers, non-Refuge volunteers and Student Conservation Association (SCA) interns. Refuge volunteers are required to go through a 20 hour orientation and training and commit to 16 hours a month (this is flexible). Currently, there are 113 Refuge volunteers on staff. Non-Refuge volunteers include scout and church groups, and other one-time volunteers.

Volunteers were vital to the success of many Refuge events including the Native Plant Sale, Kids' Day, Earth Day, National Wildlife Week, Coast Clean-up and the Avocet Festival wildlife arts and crafts fair.

Some of our youngest volunteers shared their knowledge with their peers during this past summer's Junior Naturalist program. These volunteers, previous graduates of the Junior Naturalist program, assisted staff in teaching 3rd through 6th graders about the salt marsh and the importance of preserving the environment.

Refuge volunteers assisted in various projects at other National Wildlife Refuges. Working with the cooperating association, one volunteer continues to do the bookkeeping and another orders the books not only for San Francisco Bay NWR, but also for sales outlets at Klamath and Sacramento NWR. Two Student Conservation Association interns assisted Humboldt Bay NWR at an environmental education conference in Humboldt County. Teachers and their classes learned about conservation and the environment through activities led by these interns.

A major project this year was the staining of the Visitor Center/Office building by volunteers. Three-quarters of the building was stained by one volunteer who performed 200 hours of community service, and the rest was done by a local Rotary Club along with about a dozen refuge volunteers.

Students in a Conservation Biology class at San Jose State University conducted a survey of the invertebrates and plant species of the Warm Springs Seasonal Wetlands parcel. The discovery of previously unrecorded endangered species candidates and other results of this survey have been highly beneficial in the management of this area.

Volunteers organized and ran the Avocet Festival (the annual wildlife arts and craft show) that this year attracted over 2,000 visitors to the Refuge. A part of the Festival was the Environmental Fair, which included conservation organizations from around the area, who provided information tables, exhibits and programs.

Over 600 people contributed more than 1,200 hours during the ninth annual Coast Clean Up. In addition, 300 volunteers from a church donated time on two occasions to thoroughly clean up Coyote Creek Lagoon of years of accumulated debris.

People serving alternate court sentences, who were instructed to perform community service contributed over 270 hours to the Refuge. They assisted with administrative tasks, maintenance and even converted office space at the Environmental Education Center.

A vital part of the refuge's personnel is the Student Conservation Association (SCA) interns. SCA is a worldwide organization that places people for a 3-month period at various refuges and parks throughout the world so they can gain experience in careers in conservation. This past year there were 9 SCA interns who contributed 40 hours a week for at least 16 weeks. Several interns were asked to stay longer due to their obvious commitment and acquired expertise in their various projects. Two interns stayed for 7 months. In exchange for their full time volunteer services, the Refuge provided them with housing and a small subsistence of \$75.00 per week.

Four of the SCA interns, Patty Scifres, Sanam Radjy, Mark Drever and Erik Kelchin worked with the Wildlife Biologists, assisting with endangered California clapper rail and predator surveys, habitat restoration and snowy plover monitoring and protection activities.

Five other interns, Jill Ory, Carol Hankermeyer, Nancy Golden, Frank Caropolo, and Julia Hammond, were just as vital to the Environmental Education Program. SCA interns were essential in assisting with teacher orientations, field trips, classroom presentations, Marsh-In Camp and the Junior Naturalists program. Interns also worked on the *Trekking the Refuge* program, developed field trip activities and created teaching aids. (See also Sections H.2 and H.3.)

In June, Refuge volunteers were recognized for their efforts at the annual Volunteer Picnic and Recognition Ceremony. Chickens, steaks and hot dogs were barbecued by staff and everyone else brought a dish to share. All volunteers received a Certificate of Appreciation provided by the Regional Office. In addition, Volunteers who had accumulative hours in increments of 500 and 1000 hours were recognized with special pins. Special recognition was given to Ken Crowley, who reached the 3,000 - hour mark. A special plaque and a letter of appreciation from the Regional Director were presented to Ken.

The highlight of the Volunteer Awards Ceremony was the recognition of volunteers who had the top ten number of hours for the past year. Those volunteers received a Fish and Wildlife Service plaque and a certificate signed by the Secretary of Interior for their tremendous contribution in time and effort to the Refuge. They were Ida Berkowitz, Howard Collins, Ken Crowley, Alvin Dockter, Helen & Stanley Kalick, Arthur Wellens, Stan Brown, Ruth Mundy and Lee Lovelady. Volunteer of the Year honors went to Jean Noll for the third year in a row; she contributed 636 hours to the Refuge.

One advantage of the location of this urban wildlife refuge is that there is a large population base located nearby that serves as a vast reservoir of potential volunteer candidates. We recruit new people through displays at various off-site fairs, word of mouth advertising, and articles in the quarterly *Tideline* newsletter. An application which describes the volunteer program is also available in the Visitor Center. We conducted three 20-hour training sessions for new volunteers in 1993.



Jean Noll: Volunteer of the year three years in a row.



Volunteer Howard Collins keeps the visitor information board up to date.

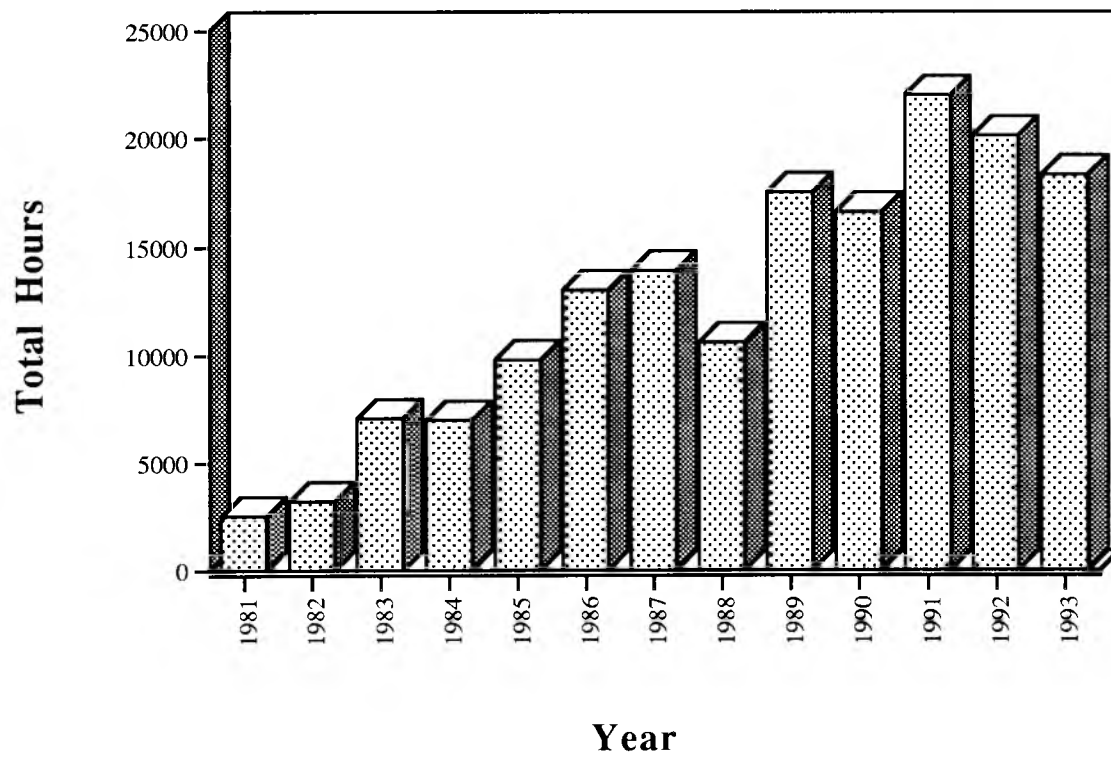


Volunteer Stan Brown manages the San Francisco Bay Wildlife Society membership roster.



The volunteer banquet gives us a chance to let the volunteers know how much we appreciate their help.

Volunteer Hours San Francisco Bay National Wildlife Refuge



H. PUBLIC USE

H.1. General Public Use

San Francisco Bay National Wildlife Refuge serves a dense, local population of more than 7 million people. It is an ideal place for Bay area urbanites to visit a relatively unspoiled area, enjoy the local wildlife and learn about nature, conservation and wildlife management. During 1993, 303,000 people visited the Refuge. Of these, 8,759 students, 450 teachers, and 1,699 other adult leaders attended outdoor classroom activities at the Environmental Education Center in Alviso or the Visitor Center in Fremont. Thirty-two thousand people stopped in at the Visitor Center, and 7,277 attended interpretive programs, special events, artist receptions and other events. Over 71,000 visitors received our self-guided interpretive messages when they read our wayside exhibits. The Visitor Center in Fremont was closed on Mondays as the result of a directive from the Washington Office. In addition, it was closed all Federal holidays due to limited funding for staff. The trails and fishing pier remained open during all daylight hours everyday except New Year's Day, Thanksgiving and Christmas.

General public use increased during 1993 at the Environmental Education Center (EEC). This was the first full year of operation for the EEC Weekend Interpretive Program, which is funded by the City of San Jose and the Santa Clara County Nonpoint Source Pollution Control Program. The Center is open from 10 am to 5 PM on Saturdays and Sundays, and is staffed by a half-time, temporary Interpretive Specialist (GS-5). We experienced good turn outs by the public for trails and nature walks. The number of drop-in visitors at the EEC weekend program totaled 3,233. The combined EEC total for all visitor and field trip usage for weekdays in 1993 was 10,768 persons; this figure includes school groups; general public visitors (i.e., drop-in); workshop, meeting, and field trip orientation participants; summer camps; and volunteer trainings. Eleven organized groups visited this year. These groups were a mixture of students from other public programs, landscape cleanup volunteers, scout groups and youth programs.

An interactive computer program, *Exploring The Estuary*, was purchased for the weekend program by the Nonpoint Source Pollution Control Program. Apple donated a computer to run the software and a Refuge volunteer built a cabinet to house the system.

Most of our 1993 visitors participated in recreational activities other than formal programs at one of the centers. The public fishing area (88,000 users), trails (65,930 users), sloughs (3,900 boat duck hunters, and 325 non-wildlife recreational boaters), and other public areas were used by over 158,000 visitors. Many of these people were contacted in the field by Refuge volunteers on patrol.

H.2. Field Trips (Outdoor Classrooms) - Students

The Refuge's Environmental Education Program (EEP) is administered at both the Environmental Education Center (EEC) in Alviso and the Visitor Center (VC) in

Fremont by Environmental Education Specialists (EES). Once again, the Refuge offered exciting field trip programs for students; a new *Trekking the Refuge* field trip program was piloted at the VC in the fall of 1993.

These programs rotate small groups of students from one learning station to the next, throughout the day. As a result, students and accompanying adults spend an entire school day learning about the importance of the Resource Management Objectives of the Refuge: preserving and protecting significant wildlife habitat in the South Bay, protecting endangered species, and protecting migratory birds. Before bringing a group to one of our field trip programs, at least one educator and one other adult must attend a 4-hour field trip orientation workshop. Other adults from a group are encouraged to attend these workshops too. Upon completion of a field trip orientation workshop, an educator has all the necessary tools to plan and conduct an exciting field trip. A high adult-to-student ratio (2 adults to every 10 students) is important to enhance their learning experience; students are taught more effectively because of individual attention. One adult is a small-group chaperone, moving with his/her group to each learning station. The other adult teaches an activity at a learning station, repeating the activity for each group during the field trip day. The educator acts as a "floater", available to help parent leaders with their learning station activities, answer field trip logistic questions and take care of any student emergency.

There are two types of field trip programs at the Refuge. The Salt Marsh Manual field trips, described above, differ from the new *Trekking The Refuge* field trips in the amount of staff time needed. For *Trekking the Refuge* field trips one staff person hands out the activity equipment day packs at the beginning of the field trip and assists the adults in cleaning and counting the equipment at the end of the field trip. All the pre- and post-trip activities and field trip activities have been pre-selected by the EE staff. The *Salt Marsh Manual* field trip requires the help of two staff people in conducting the field trip opening and closing activities, showing the adult leaders and chaperones the sites where the learning-station rotation activities are to be conducted, demonstrating the first rotation of an activity and acting as a "floater", overseeing the flow of the field trip with the educator in charge. The educators select their own field trip activities and pre- and post-trip activities from the *Salt Marsh Manual - an Educator's Guide*. A typical field trip has six learning stations (hands-on, environmental education activities are conducted at these stations) and the group consists of two educators, sixty five students, six learning station leaders, and six to eight chaperones.

With only one environmental education specialist at the Education Center and only one at the Visitor Center, the high quality of the field trip program and the number of students served would not be possible without the help of Student Conservation Association (SCA) interns and a few dedicated volunteers.

The volunteers and SCA interns learn the basics of the *Salt Marsh Manual* field trip program and lead the first rotation of a particular activity for each field trip. In addition, they conduct opening and closing presentations, and provide support to educators and parent leaders by answering any questions they have about conducting activities at the learning stations. When not busy with visiting school groups, the interns and some volunteers help the staff with special projects, such as designing activity props,

writing closing activities, conducting pre-field trip slide show presentations, and developing new field trip activities, which enhance the educational experience for the students. Thanks to one very dedicated volunteer, pre-field trip slide presentations were given to over 1,100 students attending school in Santa Clara County.

During 1993 the Environmental Education Program underwent many exciting changes. The EEP staff, three Environmental Education Specialists, developed the Refuge's first draft of an extensive *Environmental Education Plan*. This Plan provides a direction for the EE Program and ensures implementation of the Plan's components as time and staff availability allows.

As a result of the 1992 Environmental Education Methods Training Workshop that was designed and conducted by the EE staff and other Fish and Wildlife Service personnel, Resource Management Objective sheets were developed. The Resource Management Objective sheets make a stronger connection between field trip activities, student behavior and the Refuge's resource management objectives. Activity leaders use these simple diagrams to illustrate how everything is tied together. (See diagram on next page)

In 1993, during January and September when field trip demand was slow, EE Specialists planned, reorganized and prepared for student visits. The month of January was devoted to the development of the first draft of the EE Plan, as well as to curriculum development and educational props inventory and replacement. This September, while in the midst of developing the new field trip program, *Trekking the Refuge*, the EES stationed at Fremont transferred to another region; the remaining EES's spent more time preparing for the field trip programs at both sites. September and the first two weeks of October were primarily devoted to the design and implementation of the first pilot of *Trekking the Refuge*.

Due to the loss of the Visitor Center's EE Specialist and the piloting of the new program in Fremont, the number of reservations taken for *Salt Marsh Manual* field trips were reduced; both sites were booked only two days a week during October and November. At the Visitor Center, the SCA intern coordinated the *Salt Marsh Manual* field trip program and the Environmental Education Coordinator took charge of the *Trekking the Refuge* program. One day each week was reserved for field trip groups piloting the *Trekking the Refuge* field trip program. The reduction of field trip days from 4 to 3 days a week is reflected in the lower number of students attending field trips at the Visitor Center in Fremont. However, at the EEC in Alviso this same period showed a greater number of students participating in field trips in 1993 than in 1992. This is attributed to more "non-traditional" student groups using the facility concurrently with the *Salt Marsh Manual* field trip program. These "non-traditional" groups are docent-led by groups from local non-profit organizations who require only equipment set-up by the EE staff.

Reservations for the popular *Salt Marsh Manual* field trips are taken twice a year. Reservations for the Spring session, conducted February through July, began on December 1, 1992. Field trips for the 1993 calendar year began on February 2. Reservations for the Fall session, conducted October through December, opened on September 9, 1993. Field trips for the Fall session began on October 13. Using this type of booking schedule, we had minimal field trip cancellations.

SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE

ACTIVITY

WHERE HAVE ALL THE WETLANDS GONE?

WHY DOES THE REFUGE EXIST?

**To preserve and enhance wildlife
habitats in South San Francisco Bay.
To protect threatened and endangered species.**

HUMAN IMPACT ON REFUGE HABITATS

**Loss of habitat due to
landfill and development.**

What is the Refuge staff doing?

Refuge staff acquires and
restores wildlife habitat.

What can students do to help?

Students can recycle and create less
garbage, thereby reducing
the need for landfills.

Adding the *Salt Marsh Manual*, *Trekking the Refuge*, and "non-traditional " field trips from both the VC and EEC gives us a grand total of 8,759 students and 2,149 educators, volunteer leaders, and chaperones participating in educator-led trips to the Refuge in 1993.

Environmental Education Center Field Trips - Most of the groups using the EEC for a field trip participated in the *Salt Marsh Manual* field trip program. 4,492 students and 1,151 educators, volunteer leaders, and chaperones visited the site on this type of educator-led field trip.

The EEC was also used by various student groups not participating in the *Salt Marsh Manual* field trip program. 1011 students, 45 educators and 128 volunteer leaders made use of the site for other educational activities such as docent-led field trips (conducted by non-profit organizations), walking tours, scout meetings, and scientific study (high school - college level). One fifth of the field trips were conducted by the non-traditional groups.

The combined totals for usage by all education groups for 1993 are as follows: 5503 students, 277 educators, 1047 volunteer leaders and chaperones.

For the seventh consecutive year, there was a greater demand for the *Salt Marsh Manual* field trip program than the staff was able to meet. With the exception of groups such as Santa Clara Audubon, Youth Science Institute and Environmental Volunteers who use the site requiring only field trip equipment and no staff support, no double bookings were accepted. Eighty-one (81) classes were placed on a waiting list and only two (2) of those groups were given dates for field trips; over 2,300 students were turned away. Clearly, the demand for the program is not being met; however, the EEC cannot accommodate additional staff supported field trips without additional personnel.

The Education Program's most recent field trip facility addition was the construction of a water sampling dock in Mallard Slough. Mallard Slough, one of the aquatic habitats at the Environmental Education Center, is a natural waterway existing amid the human-made salt ponds of the far south Bay. Although it appears to be your average tidal slough connected to the Bay, this is not the case. Mallard Slough is unique because each day it is the recipient of more than 100 million gallons of fresh water. This water comes from the outflow of the San Jose, Santa Clara Pollution Control Plant. Due to the enormous volume of treated water entering the slough, the habitat has been converted to a fresh water ecosystem. To allow students to conduct limnology investigations of this intriguing environment, a water sampling dock was built in October 1993. New educational activities will be developed for the floating dock in 1994.

Visitor Center Field Trips - The *Salt Marsh Manual* field trip program at the Visitor Center completed its sixth year at the end of 1993. A grand total of 3,112 students, and 796 educators, volunteer leaders, and chaperones participated in *Salt Marsh Manual* field trips.

At the VC, a pavilion and an old, former pumphouse serve as the hub for the daily field trip program. The pumphouse, used for conducting field trip activities, is also used by

California State University, Hayward, field biology and ecology classes to conduct studies on the salt marsh. The pavilion, completed in 1992, is an important building for the *Salt Marsh Manual* field trips; field trip and closing activities are conducted in the pavilion. This year, wood shutters were built by a volunteer and installed on one side of the building. After the doors are added and shutters installed on the remainder of the windows, audio-visual programs will be possible in the pavilion.

Once again this year, there was a greater demand for the *Salt Marsh Manual* field trip program than the staff was able to meet. Twenty three separate groups, with 14 to 65 students per group, were placed on a waiting list. An estimated 600 students were turned away. It is evident that there is a greater demand for the program than is currently being met.

To help meet this demand, *Trekking the Refuge* field trip program was designed and piloted in 1993. Eventually, *Trekking the Refuge* field trips will allow for double bookings at the VC, because they take place in a different area than *Salt Marsh Manual* Field Trips and they require minimal staff participation. *Trekking the Refuge* takes place on the Tidelands Trail, a 1 mile loop, with a maximum of 35 students at a time. The program is designed for grades 3-8. These field trips are entirely educator run. Educators lead the opening and closing activities with the entire class, and lead the class on a 45 minute trail walk guided by observation questions in a bingo style format. Educators recruit adult leaders to lead and chaperone three pre-selected, learning station rotation activities; Salt Marsh Safari, Salt Pond Private Eye, and Slough and Mudflat Sleuths. All of the needed equipment for the opening and closing activities and station rotation activities is in day packs that the educators check-out and carry with them. There were five *Trekking the Refuge* field trips, with 29 teachers and parents and 144 students participating in the pilot program in the fall of 1993.

Adding the *Salt Marsh Manual* field trips and *Trekking the Refuge* field trips gives us a grand total of 3,256 students and 825 educators and leaders participating in educator led field trips at the Visitor Center.

Summer Day Camps – Day camps for local children were conducted during the month of July at both the Environmental Education Center and at the Visitor Center. The Refuge offered the camps free of charge to children entering the fourth, fifth and sixth grades in the fall of 1993. The two on-site EE Specialists cooperatively designed, planned and conducted both the Marsh-In camp at the EEC and the Junior Naturalist camp at the VC. The SCA intern assisted by adapting activities, making props, setting up equipment and writing a skit that was performed by the leaders at the overnight session. The SCA intern along with several volunteer leaders enthusiastically led the campers through a variety of activities that included simulation games, guided imageries, art projects and share circles. The theme for 1993, "*Trashbusters: Defenders of the Environment*," focused on how human activities affect wildlife and the environment. It was our intent that, through environmental education, local children would become more aware of their own behavior and the effects it may have on wildlife. Specific goals were: to educate children about the harmful effects litter may have on wildlife; to introduce children to the idea of non-point source pollution and its effect on the environment; to reinforce actions such as recycling, reducing waste, reusing materials, and refusing harmful products whenever

possible; and to empower them to take action. Both Marsh-Ins and Junior Naturalists helped to make the Refuge safer for people and wildlife by spending a Wednesday morning at Coyote Creek Lagoon picking up the trash that had blown in from the landfill or washed in on the tide. Items that were recyclable were taken to the local recycling center where the campers learned more about the process. Both camps resulted in engaging learning experiences for everyone involved.

Marsh-In Camp originated with the intent of building rapport with the children living in the local community of Alviso. Keeping with this philosophy, the twelfth annual Marsh-In summer day camp was held for one session, Monday, July 12 through Friday, July 16. The camp was attended by thirteen children. Whole-group and small-group activities were led by a group of zealous volunteers, consisting of one volunteer naturalist from the Environmental Volunteers, one SCA intern and nine Refuge volunteers, five of which were high school students and former Junior Naturalists. The combination of enthusiasm and high leader-to-camper ratio allowed for the campers to receive a good amount of individual attention.

Marsh-In camp was held at the following times: 9:00 AM to 12:30 PM on Monday and Tuesday; 9:00 AM to 2:00 PM on Wednesday; and 6:00 PM Thursday to 9:30 AM Friday. This was the seventh year of the five-day program with an overnight session. Once again, the camp was a great success. As a result of the summer camp program the children living in Alviso have an increased awareness of the many factors that impact the habitats of the refuge. Additionally, young persons that have participated in the summer programs have developed a greater sense of stewardship for the EEC.

Junior Naturalist Camp originated with the intent of providing children in the tri-city area (Fremont, Newark, Union City) with an opportunity to learn more about nature at the Refuge. Because of the popularity of the program, children must apply by sending a letter stating the reasons they want to become Junior Naturalists; this activity reduces the number of applicants. To ensure that the same children don't attend year after year, while others are turned away, preference is given to first-time participants. Camp was held for one session, Monday, July 19 through Friday, July 23. The camp was attended by twenty-three children. Whole-group and small-group activities were led by one SCA intern and six refuge volunteers, five of which were high school students and former Junior Naturalists.

Junior Naturalist camp was held at the following times: 10:00 AM to 2:00 PM on Monday and Tuesday; 9:00 AM to 2:00 PM on Wednesday; and 6:00 PM Thursday to 9:30 AM Friday. This was the first year of a five day program with an overnight session. Even though it was quite successful, the overnight session will not be repeated at the Fremont site as it requires additional staff participation.



The floating dock permits easy water sampling and marsh studies.



Trashbusters at work at Coyote Creek Lagoon



While plastic, glass and aluminum from Coyote Creek Lagoon are transformed into cash (\$6.82!), *Trashbusters* take a "behind the scenes" look at recycling.



Marsh-In *Trashbusters* 1993



Marsh-Ins begin to understand that a whole lot of producers are needed to support the pyramid of life.



Marsh-Ins meet with numerous hazards, introduced by humans, as they "migrate" through the *Lucky Ducky* activity course.



Junior Naturalist *Trashbusters* 1993



Junior Naturalists discover the difficulties in cleaning up an oil spill.



The closing *Share Circle* gave each Junior Naturalist a chance to reflect on the day's activities and express his/her feelings to the group.

H.3. Field Trips (Outdoor Classrooms) - Teachers

Field Trips -- In the San Francisco Bay Area, where many environmental education facilities and programs are available for educators to choose from, the Refuge Environmental Education Program is unique. We provide a facility where educators lead their own field trips. As in previous years, the EES conducted trainings for educators (includes teachers, youth leaders and outdoor recreation leaders) interested in participating in the Refuge's educator-led field trip programs. Following the training and guidance we provide, educators plan their field trip, prepare the students and adult leaders and conduct the field trip. By having educators fully responsible and highly involved in their field trip, they are more likely to integrate the classroom curriculum with their field trip activities, providing students with a learning environment which extends into the classroom beyond the day spent on the Refuge. As a result, students achieve a more meaningful, in-depth experience. Over 10,908 students, their teachers and parents went through the field trip program.

During the spring and summer of 1993, the Environmental Education staff and three teachers with previous experience conducting *Salt Marsh Manual* field trips (see page 8) designed a new field trip program, *Trekking the Refuge*, that was piloted at the Visitor Center in the fall of 1993. The teachers helped the EE staff design the field trip activities, evaluated the first field trip orientation workshop, and brought their students to and evaluated the first field trips. In addition to the initial three teachers who helped to design *Trekking the Refuge* field trips, teachers from Warwick Elementary School in

Fremont actively participated in piloting the *Trekking the Refuge* program. The *Trekking the Refuge* field trip program is being developed in the hope of meeting some of the overwhelming demand by Bay Area educators who want to conduct field trips at the Refuge. Eventually, *Trekking the Refuge* field trips will allow for double bookings at the VC, because they take place in a different area than *Salt Marsh Manual* field trips and because they require minimal staff participation. (For descriptions of these field trips, see section H.2 Field Trips.)

Salt Marsh Manual Field Trip Orientations and Planning - The majority of the field trip orientation is spent on background information and learning how to lead the activities found in the *Salt Marsh Manual - an Educator's Guide!* The logistics of planning a field trip, as well as rules and regulations, are also discussed during the workshops. The staff is available for individual planning sessions should educators require assistance in planning their trips. A total of 10 Field Trip Orientations were offered at the Environmental Education Center in Alviso with 217 individuals participating plus 5 educators/leaders who returned for one-hour planning sessions. A total of 9 Orientations were held at the Visitor Center in Fremont with 189 educators/leaders being trained and 4 educators returning for one hour planning sessions. The confidence gained by educators and volunteer leaders at these orientations culminates in a successful field trip.

The Refuge Environmental Education Program staff continues to distribute the *Salt Marsh Manual - an Educator's Guide!* The 220 page guide was designed to facilitate discovery, learning, and enjoyment of field trips to the San Francisco Bay National Wildlife Refuge and is now in its third revised edition. It contains background information, area maps, planning and group management hints, classroom and on-site activities, and additional resource information. The activities in this guide are for grades K-8. The Educator's Guide is available free of charge to all educators and group leaders who attend a *Salt Marsh Manual* Field Trip Orientation Workshop. Those not attending the orientation can obtain a copy for \$10.00.

Trekking the Refuge Field Trip Orientations - During the field trip orientations, the educator learns how to conduct pre-selected openings and closings, a trail walk, and three learning station rotation activities. In 1993, two orientations were held with 16 educators and 6 adult leaders attending orientations. During the orientations, comments and suggestions made by educators and adult leaders were written down in order to evaluate the first pilot.

The first draft of the *Trekking the Refuge* Educator's Guide included an introduction to the Refuge, background information, pre-visit preparation hints, and on-site activities (the opening and closing activities, a trail walk, and the three learning station rotation activities). The first draft was copied and distributed in limited numbers (free to educators attending orientations) and is expected to be revised in 1994.

Educational Resources -- The Audio Visual Lending Library for the Environmental Education Program exists at both sites. VHS videos are available for educators to check out for 2 to 3 week periods.

Who Did the Owl Eat? depicts a barn owl's hunting and eating habits, regurgitation of an owl pellet and directions on how to dissect a pellet. Appropriate for grades first through sixth, the video is accompanied by charts, curriculum, and script. Educators are encouraged to copy the tape and charts to keep in their school curriculum library for future use. Other refuges have copied the tape to lend out to educators.

The 25 minute video about the San Francisco Bay and Delta, *Secrets of the Bay*, shows the history of the bay and its sometimes conflicting interests. This video is appropriate for fourth grade through college.

Fabulous Wetlands is an 8 minute video that takes a humorous, yet informative look at wetlands -- what they are, how important they are, and what we can do to protect them. Perfect for pre-field trip preparation, this video is appropriate for third grade through high school.

A Home for Pearl and accompanying guide is a video that teaches about wildlife habitats. It is divided into four parts: two 15-minute segments and two 20-minute segments. Each can be viewed as a separate unit incorporating supplementary activities provided in the guide. It is appropriate for first through sixth grades.

In addition to classroom videos, several training videos are available through the Audio-Visual Lending Library. Educators can show the videos to adult leaders as training for an upcoming field trip. The videos include Brine Shrimp Lab at the Environmental Education Center, Brine Shrimp Lab at the Visitor Center, and Mud Creature Study at the Visitor Center. The training videos consist of background and "how to" information and footage of the activity during an actual field trip.

Educator Workshops -- Several environmental education workshops were conducted in 1993. The *Adopt-an-Endangered Species* workshop was cosponsored by Randall Museum in San Francisco. Educators learned how their schools can adopt a local endangered species and become part of the California Endangered Species Education Program. The National Audubon Society, the California Department of Education and the Department of Fish and Game sponsored this program. The workshop outlined how to involve students in this action-oriented, interdisciplinary program. Students practice critical thinking and communication skills as they learn about their species and develop a plan of action to educate and involve their community in preserving its habitat. An implementation and resource guide was given to each participant.

The *Tule Technology* workshop offered an opportunity to look into a sustaining culture of the past. The material objects of a culture reflect the values and lifestyles of a people and are an excellent vehicle for teaching culture and natural history. An objective of environmental education is to promote a caring and nurturing attitude in children about the natural world and the importance of habitat preservation as reflected in Native California culture. A total of 45 educators attended these workshops.

Educational Courses and Programs

National Environmental Education Course -- Under-Valued & Under-Utilized Tools for Resource Managers. EE Program staff attended this course offered by the U.S.

Fish & Wildlife Service, Office of Training and Education at Leetown, West Virginia. The course was open to all interested Service personnel, and was attended by supervisors, refuge managers, project leaders, and administrative personnel from all levels of the Service.

The goal of the course was to provide an awareness of the value of education and outreach in the Fish & Wildlife Service. Participants learned about education and outreach strategies and how these strategies could help achieve resource management objectives of the Service. Fran McTamaney presented the session on Strategies That Work!- San Francisco Bay National Wildlife Refuge. The main focus of her session was showing how each activity conducted at the Refuge met a resource management objective (RMO). A work sheet for participants to help them identify RMO's and resource management issues was used in the session. (See sample work sheet in appendix)

California Aquatic Science Education Consortium -- In 1990, a consortium of agencies, organizations, and citizen groups was established for the purpose of encouraging, supporting, and enhancing aquatic (fresh and marine) education programs for informal groups in the State of California. The initial formation of *The California Aquatic Science Education Consortium* was funded by a grant from the National Science Foundation. To accomplish its objectives, the Consortium is supervised by a Board of Directors; SFBNWR was represented on the board in 1993. The first project that is being funded is the development of five aquatic curriculum units. *Plastics Eliminators, Water Inspectors, Fresh Water Guardians, Wetland Protectors and Creek Watchers*. All of these guides were completed and distributed in 1993.

H.4. Interpretive Trails

The Refuge has two trails with interpretive wayside exhibits. These displays describe the habitat, the cultural history, the ecological dynamics and geology of the areas that visitors walk through. They are entertaining, easy to read, visible without being intrusive and serve as an important supplement to our interpretive effort.

The self-guided trails are especially important during hours when the Visitor Center is closed. Before 10 AM, and from 5 PM to sunset trail use is often heavy. Refuge volunteers patrol the trails, talking with visitors and providing more information to people as needed. They also pick up trash and make note of the wildlife they see.

The Refuge's main interpretive trail, the Tidelands Trail, is registered as a National Recreation Trail in the National Trails System.

H.5. Interpretive Routes Nothing to report.

H.6. Interpretive Exhibits, Demonstrations and Special Events

During 1993, 125,480 visitors participated in interpretive activities at the Refuge. Of these, 117,469 took advantage of our self-guided interpretive trail, viewed fishing pier exhibits, or visited the Visitor Center or the Environmental Education Center to watch films or videos and look at the educational displays. The remaining 8,011 participated in the numerous naturalist-conducted programs such as walks, van tours, talks, slide presentations, astronomy programs, or bicycle or canoe trips. Volunteers leading the astronomy programs provided telescopes and expertise for these popular events.

Every day brings a steady stream of inquisitive Refuge visitors past our Visitor Center reception desk. On weekends, the Environmental Education Center also receives drop-in visitors. Our volunteers who daily staff the desks are knowledgeable and always willing to help out. We would not be able to present the variety of programs we do without them.

The natural history of the Refuge was well represented in our 1993 programs with topics such as salt marsh ecology, insects, birds, seasonal wetlands, endangered species, edible plants, geology and mammals. Our volunteers staff was quite active during 1993 giving 98% of our weekend public tours and interpretive programs. A number of programs of global importance were also given by local experts. Topics such as Ocean Pollution, Air Quality and Rain forest Ecology were presented and well attended by the public. For complete descriptions of these programs, look in the calendar section of the *Tideline* newsletters included at the back of this narrative.

Our program audiences were as diverse as the program topics that we presented. Audubon chapters, day care centers, garden clubs, historical societies, scout troops, community groups, senior centers, teachers associations, college classes, and women's organizations, among many others, took advantage of the available programs. The greatest demand for naturalist-led activities, however, came from families.

Among the most popular activities during 1993 were the tours of Drawbridge, an abandoned hunting and fishing community in a salt marsh setting. The dilapidated town stands as a reminder of the consequences of human destruction of the native environment. This was the theme as more than 400 people visited the area during tours offered on Saturdays from May through October. Other weekday and weekend tours were arranged by special request for walking clubs, photography groups and other organized groups.

Many off-site events helped to increase public recognition of the Refuge and its programs. Staff members and volunteers attended information booths at these events, where they distributed literature and/or habitat fun packs, and in some cases led EE activities. The Bay Area Environmental Education Resources Faire for K-12 educators, the Santa Clara Valley Audubon Society Education Day, Berkeley Bay Day, Sulfur Creek Wildlife Day, the Crab Cove Sea Faire, a host of Earth Day festivals around the Bay Area, and many other special events all provided opportunities for the Public Use staff and volunteers to reach out to the public.

In May, two environmental education specialists and 2 volunteers traveled to Arcata and assisted Humboldt Bay NWR's manager at the Redwood Environmental Education Faire. The group staffed a booth and led presentations on wetlands and bird migrations for 4 fifth grade classes.

Throughout the year, staff members spoke to numerous civic, business, church and social groups, providing nearby communities a service while disseminating information about the Refuge and its resources. Career talks were frequently given to students at local high schools and intermediate schools.

Santa Clara Valley Audubon Society Education Day -- On March 3, the Environmental Education Program staff attended the Santa Clara Valley Audubon Society Education Day, where they led bird activities for this fair featuring California wildlife and local habitats. The focus was on environmental education programs for K-6th grade students, parents, and teachers. The event was held at McCellan Ranch in Cupertino: Santa Clara Valley Audubon Society headquarters.

Bay Area Environmental Education Resource Fair -- On Saturday, January 10, at the Marin Civic Center in San Rafael the entire EEP staff and interns attended the popular Bay Area Environmental Education Resource Fair (BAEER Fair). The focus of the fair was to bring people closer to the resources and issues surrounding our natural world. It provided science and ecology workshops and exhibits for educators K-12. The staff handed out educational information, posters and the new central valley wetlands *Habitat Fun Packs* curriculum guides at the Refuge booth and attended several of the workshops.

Redwood Environmental Education Fair -- Annually, EEP staff and volunteers from San Francisco Bay NWR prepare for and conduct the EE presentations and activities at the Redwood Environmental Education Fair (REEF). In 1993, two Refuge EE Specialists and two Refuge volunteers participated in REEF, supporting the staff at Humboldt Bay NWR which does not have a public use staff. The fair was held on May 28, 1993. One volunteer assisted Humboldt NWR's manager at an information table distributing pamphlets and answering questions about the refuge. Staff from the Coastal California Fishery Resource Office, who shared the table, set out several confiscated articles made of animal parts. The table was visited by many curious students as well as several inquisitive adults.

The two EE Specialists, assisted by a refuge volunteer, led presentations on wetlands and bird migration. Students were split into two groups (about 16 in each) to allow for a more personalized experience. Each small group participated in both presentations; each session was 50 minutes long and each presentation lasted for 25 minutes with the activity. "Where have all the Wetlands Gone" accompanied the wetlands presentation, while "Migration Headache" was done with bird migration. Sessions were conducted for four fifth grade classes. The presentations met Humboldt NWR's resource management objective that promotes understanding of the importance of wetlands and the need to preserve and restore wetlands for endangered species and migratory birds.

Special events were held at the Refuge during 1993. The following briefly describes these programs and events:

California Coast Clean-up Day -- For the sixth year, the Refuge celebrated COASTWEEKS by participating in the California Coast Clean-up Day. The Refuge organized clean-up sites at five different locations on the Refuge: the Dumbarton Fishing Pier, the Ravenswood Trail, the Coyote Creek Lagoon Trail, the Alviso Marina, and the Environmental Education Center. Refuge volunteers and staff and maintenance staff from Coyote Hills Regional Park were on hand to register volunteers, distribute bags, drive vehicles and do everything else needed to make the clean-up a success. Due to the high turnout at the fishing pier parking area, we decided to have a second registration area at the boat launch and direct all newcomers there. Over 600 volunteers from local communities turned out for the four hour clean-up. Well over seven tons of debris were collected from the five sites on the Refuge. Plastics, glass and aluminum were collected separately and recycled by the California Conservation Corps. Fifty old tires were taken out of New Chicago Marsh and Alviso Slough. Trash bags were provided by the California Coastal Commission, California Department of Transportation and the Refuge. Waste Management, Inc. provided dump trucks and drivers. The East Bay Regional Park District sponsored a picnic after the Clean-up and distributed free t-shirts.

This year the Refuge sponsored a Coast Care Faire in conjunction with the Coast Cleanup. Registrants for the clean-up received coupons to be redeemed at this environmental fair held in the Visitor Center. Tote bags, tickets to Marine World/Africa USA, and coupons for Ben and Jerry's ice cream were given away. Tri-City Ecology Center, California State Hayward, San Francisco Bay Association for Environmental Responsibility and the Alameda County Clean Water Urban Runoff Program hosted information booths. A copy of the flyer advertising the Clean-up is included at the back of this narrative.

Kids Day was held in February. The program included owl pellet dissection, brine shrimp lab, face painting, a snake talk, and origami and gyotaku (Japanese fish printing). Seven volunteers helped lead the activities for 200 participants.

Environmentally Friendly Lifestyle events were held for 131 visitors in January and again in September. The theme for January's event was "Make a New Year's resolution to be kinder to the Bay". The City of San Jose's Storm Drain/Sanitary Sewer model was set up along with displays on recycling, composting and pollution prevention. In September, the City's Maze filled the auditorium with colorful panels that challenged children to make the right choices for a healthy environment.

Earth Day brought visitors together with environmental organizations who helped them learn about how to get involved with protecting our environment. Nature programs on birds, butterflies and endangered species were presented by these organizations throughout the day.

National Wildlife Week was celebrated at the EEC in April with a rain forest conservation theme. Guests included Rain Forest Action Network, Fish and Wildlife Inspectors and the Bay Area Amphibian and Reptile Society. Six volunteers helped

95 children and their parents make reptile masks and led walks to see the local wildlife.

International Migratory Bird Day was the focus of another special event at the EEC. Santa Clara Valley Audubon Society, Coyote Creek Riparian Station and the Wild Bird Center had information tables, but couldn't give their presentations because of a power failure that took all day to fix. Five volunteers and 2 interns helped with the activities which included boardwalks, bird feeder making and a bird beak game.

National Fishing Week -- In conjunction with 1993 National Fishing Week, a fishing day was held at the Dumbarton fishing pier. An interpreter from a neighboring park was asked to put on the interpretive programs and the local fishing club was on hand to help with the programs and pier fishing.



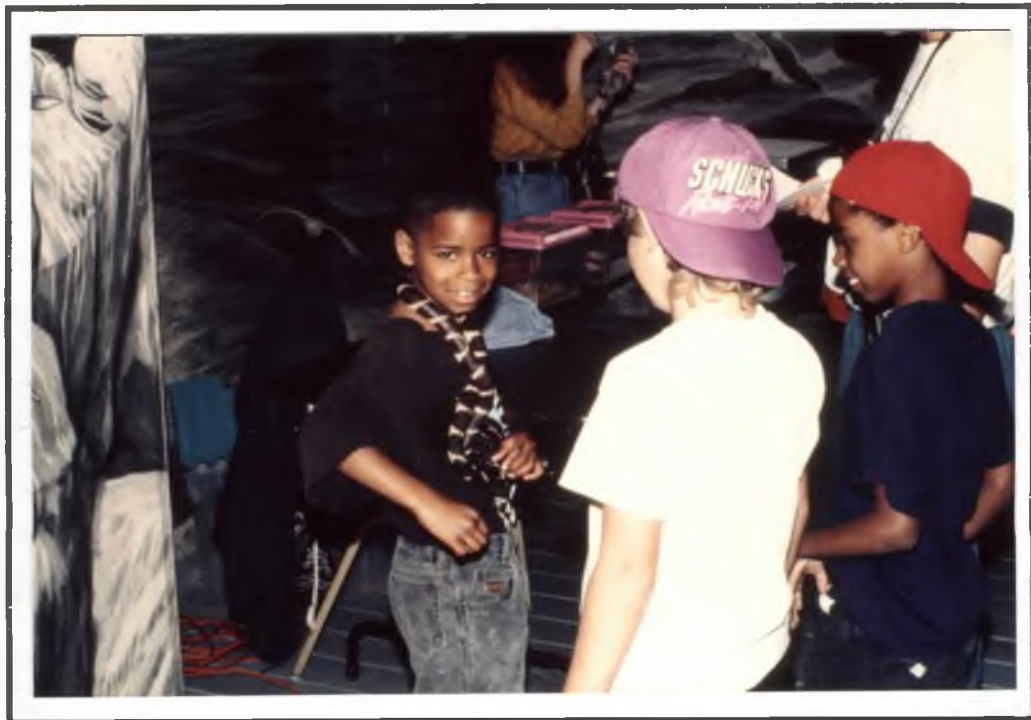
At REEF students learn about Fish and Wildlife Service and its many programs.



Volunteer Tookie Campione registers Coastal Cleanup participants.



Dissecting owl pellets during Kids Day takes a lot of concentration.



Snake neckties are all the rage at Care Faire.

H.7. Other Interpretive Programs - 1993

In spite of all of the efforts that we made during the year to contact the public, we know that there are many thousands (millions) of people out there who don't know about us or whose interests do not include endangered species, wetland preservation, migration, waterfowl populations or anything else along those lines. Reaching *these* people is one of the most challenging tasks with which the public use staff is confronted. People first need to know that the Refuge exists, then the next step in reaching them is getting them out to the Refuge where they can see with their own eyes what sort of job we are doing and what needs to be done in order to protect wildlife habitat.

In order to get the word out about us and to ultimately get people to the Refuge, the public use staff participated in some non-traditional education and outreach efforts. The following briefly describes what projects were undertaken in 1993.

Tideline -- Foremost among our non-traditional interpretation efforts was the production of a quarterly newsletter, *Tideline*. A copy of each issue of the newsletter is included at the back of this narrative. In 1993, *Tideline* was distributed quarterly to 28,000 Bay Area households, school, businesses, churches, hospitals and libraries. It was considered to be our very best means of communicating our program schedules, announcements, news stories, advertisements and editorial comments. In fact, many of our programs were filled to capacity by *Tideline* recipients. *Tideline* was used as a text at a training course for urban managers at the National Park Service's Training Center at Harper's Ferry in West Virginia. It was also used as a supplement to formal text books in many high school biology classes. We repeatedly get requests from biology teachers for subscriptions for that purpose.

Tideline, which is financed by the San Francisco Bay Wildlife Society, was printed on recycled paper. Our mailing list was managed by Volunteer Howard Collins, who coordinated additions, deletions and changes to the list. Volunteers also helped with the labeling of the issues before mailing. Without volunteer assistance, *Tideline* would not be possible.

Native Plant Symposium/Sale/Nursery -- The San Francisco Bay Wildlife Society continued to manage a Native Plant Nursery that grows plants to enhance native habitat on this and other Refuges. It was also established to serve as a vehicle for reaching out and contacting non Refuge visitors and thus bring them to the Refuge. Over 200 species of native herbs, shrubs and trees were grown in the nursery, entirely through the efforts of volunteers. Several thousand dollars in contributions were solicited and the Nursery flourished.

In September the nursery was moved to a new location. The Refuge-sponsored boy scout troop supplied the labor, constructing a shaded growing area, wooden bins for planting mix and a tool shed. The move was completed just in time for our annual sale of native plants to the public.

On October 9 we held a Native Plant Day with guest speakers, workshops, demonstrations, and the sale of California native plants. The event attracted several

hundred visitors who came to the refuge to learn about native plant horticulture, and went back home at the end of the day knowing about the National Wildlife Refuge System, the importance of wetlands, and the value of planting with native species. A copy of the flyer advertising this event is included at the back of this narrative.

The Native Plant Nursery is managed by Harry Sanders, a volunteer who is accredited as "Master Gardener" through the University of California Agricultural Extension program. The Nursery's grower is Lisa Higaki, who holds a bachelor of science in Tropical Horticulture from the University of Hawaii.

Avocet Festival -- The Avocet Festival annual arts and crafts sale sponsored by the San Francisco Bay Wildlife Society was held in November. A complete description of this event may be found later in this narrative under section H.18. - Cooperating Associations.

Federal Junior Duck Stamp Design Contest -- Another non-traditional interpretative effort was the Refuge's participation in the Federal Junior Duck Stamp Design Contest. The contest attracted 978 entries from students in grades K-12. Entries were received from 136 schools across California.

The contest encouraged students to learn about waterfowl as they created the artwork to be judged in the contest. The best artwork of these high school students was of absolutely incredible quality. This high quality art made judging the final round very difficult. The student's artwork was broken down into four grade groups, then each group was judged separately. Finalists in each group received first, second, third place or honorable mention. Judging was done according to pre-determined criteria by Refuge Manager Rick Coleman, Terry Mansfield of the California Department of Fish and Game, Rich Ratagonda, a decoy carver and competitor in the National Duck Stamp Contest, Regional Duck Stamp Coordinator Ed Murczek, and Regional Pacific Coast Joint Venture Program Coordinator Carrey Smith. Six volunteers assisted in the preparation and judging of the contest.

Non-finalist's artwork was returned to each school after the judging. The remaining 100 place winners and honorable mentions were circulated for display at appropriate locations around the State in cooperation with staff at Sacramento National Wildlife Refuge. The Best of Show winner, a parent and the student's teacher received an all-expense paid trip to Washington DC to tour Washington landmarks and attend the National Duck Stamp Contest judging.

Artists Receptions -- During 1993, the Refuge held three receptions for local artists who exhibited their original wildlife artwork in the Visitor Center auditorium. The receptions were advertised in *Tideline*, and special invitations were made and sent to the people on the artist's mailing lists. The San Francisco Bay Wildlife Society provided refreshments. The receptions were well attended and attracted many people who were first time visitors to the Refuge. The invitations and flyers advertising these events are included in the back of this narrative.

Nature Walks -- The most frequently given walk at the EEC is the Marsh Walk, a 1-hour nature walk that gives an overview of the habitats surrounding the EEC. The

value of these habitats to wildlife and the Refuge's role in preserving and managing them are discussed. If children are present, hands-on activities like looking for animal tracks and scat and collecting brine shrimp from the salt pond are included.

Birdwalks are also popular. They usually take place at 8:00 or 9:00 and average 6 to 10 participants. Most people that attend the birdwalks are new to birding, and many take advantage of the binoculars we have to loan.

On the Edible Plant Walk, visitors learn which plants of the marsh and uplands are edible and which are poisonous. We taste samples of the former, including pickled pickleweed, fennel seeds, horehound candy and elderberry jam. This walk has been very popular, and is a lot of fun for children as well as adults.

Other Nature Walks include volunteer-led photo walks, an evening walk focusing on the full moon and the tides, wildflower walks, saltmarsh plant walks, and 6-mile levee hikes.

Slide Shows -- The Drawbridge slide show is the most popular program in this category. The volunteers who present the shows do an excellent job of relating the history of the ghost town. Visitors leave with the understanding that the old hunting village failed because the surrounding habitat was destroyed.

"The Hows and the Whys of the Lows and the Highs" explored the mystery of the tides and how they effect salt marsh wildlife.

"The Life and Times of the California Clapper Rail" was a very popular program. Katherine Rambo, nature photographer and naturalist, discussed the habits and habitat of this secretive bird found only in the salt marshes of the Bay.

"Birds of the Urban Corridor" explored the fascinating ways of egrets, clapper rails and other birds that live a precarious existence in the fragile wetlands at the edge of the urban environment.

"The Bay's Unwelcome Visitors: Are They Here To Stay?" -- Andrew Cohen, author of *An Introduction to the Ecology of the San Francisco Estuary*, talked about some of the alien invaders to San Francisco Bay and their impact on the native ecosystems.

A new program is the Ohlone slide show and talk. An interpretive specialist gives a half-hour slide show in the lifestyle of the California Indians that lived near the Bay followed by a discussion using some Ohlone style artifacts from the Environmental Education Program's collection.

The Pollution Solution program is a discussion of techniques and products that people can use to reduce their contribution to pollution, especially urban runoff, products containing metals and household hazardous waste disposal.

Tours -- The ever-popular Drawbridge Tours are conducted each Saturday during the dry season. This tour is not publicized, but earns it's popularity through word of mouth advertising. Volunteer tour leaders focus on the fact that the ghost town of

Drawbridge failed because of the degradation of the saltwater marsh environment, which is a lesson even for today.

Volunteer-led bike tours usually have a full reservation roster. This is an excellent way to tour the levees in the dry season to learn about the Refuge.

One of the best places to view birds during the fall migration is along the levees. The Refuge Van Tour made this spectacular display accessible to people who can't hike or bike that far.

Other Interpretive Programs -- Eleven Brine Shrimp Labs were held at the EEC in 1993, attended by 156 people. Initially, the lab was set up in a classroom for drip-in visits over a 3-hour period. Later, the program was modified so that everyone met at the beginning and the participants collected the shrimp themselves at the salt pond. An hour and a half was enough time for collecting and observing the animals back in the lab.

Weird Science began as a program of science tricks just before April Fools Day. It was then repeated in September and around Halloween. An average of more than 20 people came for the program, many of them first-time visitors to the Refuge who read about it in Bay Area Parent. The program is a combination of demonstrations and hands-on activities.

A Birdathon in early December was a group effort to identify as many species of birds as possible. Volunteers led birdwalks for those who preferred to bird in a group. Eighteen people saw 54 species during this event.

An Introduction to Bird Watching combines a slide show and lecture with practice in the field to get new birders started in this increasingly popular leisure activity.

The Discovery Packs activity was expanded to allow inexpensive equipment and activity guides to be available to parents. Parents sign out the packs and lead their children through environmental education activities on the Refuge.



The new and improved Native Plant Nursery receives a lot of volunteer care.



The Jr. Duck Stamp Design Contest brought in exquisite artwork.



The Coast Care Faire brought environmental awareness to many.



Bicycle tours are a great way to enjoy the refuge.

H.9. Fishing

Public use of the Dumbarton Point Trail (south end of the fishing pier) and the Shoreline Trail (north of the fishing pier) continued to increase. Use of the Dumbarton Fishing Pier stayed about the same as last year, but Ravenswood fishing pier was closed mid-year because of the escalating cost of maintenance due to increasing vandalism and general littering. There were approximately 88,000 angler "uses" at the piers and the surrounding fishing areas in 1993.

Fishing from or near the piers has netted a variety of fish: leopard shark, sand shark, bat ray, shiner surf perch, kingfish, bullhead, and the elusive striped bass, white sturgeon and salmon.

H.10. Trapping - Nothing to report.

H.11. Wildlife Observation

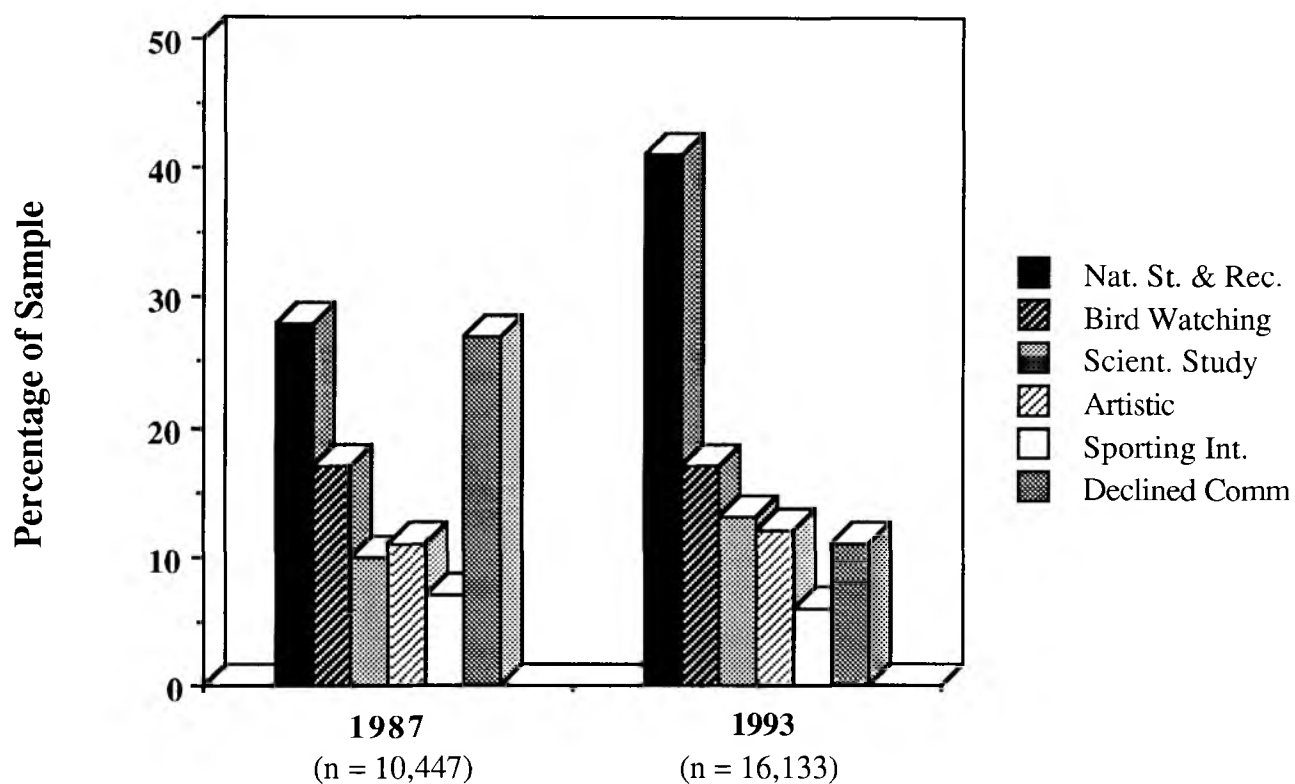
The opportunity to view wildlife in its natural habitat attracts many of our visitors. The Refuge offers a variety of habitats such as salt marsh, sloughs, extensive mud flats, open water and upland coastal chaparral, grassland and trees. This range of habitats provides an ideal area for visitors to explore, on their own or with our naturalists, when seeking local wildlife.

Some visitors participated in van tours or canoe trips on Mallard Slough and Triangle Marsh, where marsh-nesting and feeding birds were easily seen. Most visitors walked or biked the many miles of Refuge trails on their own, viewing resident nesting birds, migrating and wintering shorebirds and waterfowl, and young birds during the spring and summer months. Bird watchers revel in these opportunities. In addition, many nature study groups led field trips to our Refuge, and the Audubon Society once again conducted its annual Christmas bird count here.

One of the most popular sites for local bird watchers was the restored tidal area, Avocet Marsh, where great numbers of shorebirds and migrating waterfowl gather to feed. There is also a peregrine falcon commonly sighted here.

In July, the Refuge participated in the 17th Annual 4th of July Butterfly Count sponsored by the Xerces Society. The event was announced in *Tideline* and drew a number of seasoned, professional lepidopterists as well as first-time amateurs. The counters spent the day searching out butterflies near the Visitor Center and EEC, as well as a nearby riparian corridor, and amassed a total of 22 species. It was great fun for everyone and will be repeated in 1994!

Visitor Interests at San Francisco Bay N.W.R.



H.12. Other Wildlife Oriented Recreation - Nothing to report.

H.13. Camping - Nothing to report.

H.14. Picnicking - Nothing to report.

H.15. Off-Road Vehicles - Nothing to report.

H.16. Other Non-Wildlife Oriented Recreation - Nothing to report.

H.18. Cooperating Associations

San Francisco Bay Wildlife Society completed its sixth full year of operation in 1993. This non-profit corporation helps sponsor and finance education and outreach programs at the Refuge. In order to do this, the Society needs money, and money was generated in a variety of ways throughout the year. Wholesale and retail sales of books, pamphlets and theme-related items brought in \$34,477. Membership dues, donations and interest amounted to \$ 15,390. Our art show, native plant sale and seminars grossed \$15,277. Total receipts for fiscal year 1993 were \$ 128,340.

We had to pay many bills with this money such as, purchase of the books we sold (\$22,923), and sales tax (\$ 2,541). Even after expenses, we had enough net profit to print four issues of our newsletter, *Tideline*, (\$ 13,760), fund a petty cash fund for the environmental education and outreach program (\$ 4,662), buy thousands of dollars worth of capital equipment for the and Public Use program (\$ 5,528), and support the Public Use program with a great many miscellaneous purchases such as administrative supplies, film processing, and operational supplies.

We continued operating sales outlets at Klamath Basin Refuge and Sacramento Refuge during 1993. Thanks to the efforts of the staff and volunteers at both of these Refuge, sales increased at both places again this year. Klamath Refuge had gross sales of \$22,656 and Sacramento Refuge, in its second full year of operation, grossed \$6,225.

Our thirteenth annual Avocet Festival (previously the Christmas Wildlife and Nature Arts and Crafts Show), was held in November. Total artist sales were \$17,443. Net revenue was \$1,294, or 50% of our anticipated income. All areas of revenue were lower than expected even though our expenses for publicity were 160% of our projected budget. The continuing California recession, plus unseasonably warm weather, may have been contributing factors to the lower turnout for Christmas gift shopping.

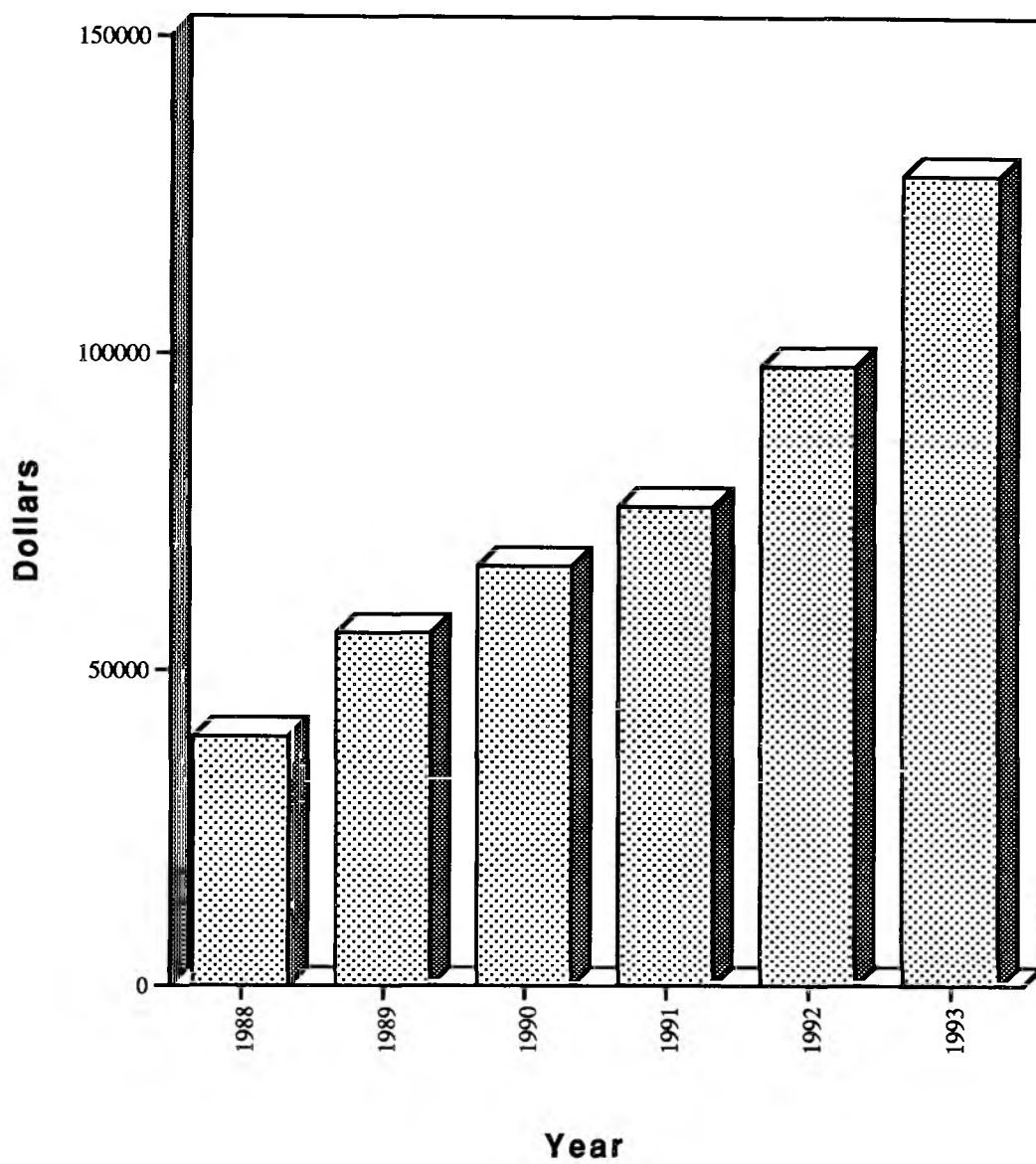
In the spring, summer, and fall of 1993, the San Francisco Bay Wildlife Society in cooperation with the U.S. Fish and Wildlife Service sponsored the fifth season of "Explore the Wild" seminars; these seminars were offered as adult-level courses:

- Point Reyes Whale Watching Cruise
- Drawing Spring Wildflowers
- Nature on Horseback
- Insects of San Bruno Mountain
- Discovering Nature Through Drawing
- Wildlife Art Workshop - Drawing Birds

The number of participants ranged from 6 to 35 per seminar, with a total of 79 participants. The seminar series netted \$880.

San Francisco Bay Wildlife Society plays a very significant role in the operation of the Refuge's Education and Outreach efforts. Like most programs at the Refuge, the Society could not exist without the many tireless hours contributed by volunteers. Volunteer Jean Noll completed her third year as the Society bookkeeper and our records have never been better organized. Stan Brown handles the entire Society membership operation. Howard Collins maintains the mailing list data base of 17,000 names for the *Tideline* newsletter. Sid Hollander again served as director of the Art Show coordinating all aspects of that fund-raiser. Volunteers help with all Society events like the art show and native plant sale; they sell the books in the bookstore and get people to become members of the Society. Nine people from the community serve on the Society's Board of Directors. The Directors provide expertise and advise about Society operations and approve Society expenditures and fund raising efforts. Thanks go to all these people who helped make 1993 another successful year for San Francisco Bay Wildlife Society and the Refuge.

San Francisco Bay Wildlife Society
Gross Revenue





JOHN STEINER: Chief of Public Use



RICH HAIRE: Outdoor Recreation Planner



PAUL WONG: Interpretive Specialist



KATHY PRZYBYLSKY: Education Specialist
(Center, front row)



FRAN MC TAMANEY:
Environmental Education Coordinator



SANDY SPAKOFF:
Environmental Education Specialist
Environmental Education Center
Director



CHRIS GARCIA: Weekend Interpretive Specialist