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Message from the Vice President-DANR

The Natural Reserve System supports university-level research and teaching in a variety of ecosystems. It is accomplishing these goals in a fashion unequalled anywhere.

At the same time, the NRS has proven to be a remarkable educational resource for Californians beyond our UC campuses. As this issue of *Transect* outlines, the NRS provides many settings — actual and virtual — for relating nature to science, art, and service for citizens who range in age from five to 95.

Several programs bring primary and secondary school students to our NRS sites and stimulate their interest in the natural world. Examples are high-

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Kindergarten teacher Marsha Ota (back row, third from right) and her class of lively five- and six-year-olds, joined by parent volunteers and UCSB biologist Mark Holmgren (back row, fourth from right, holding shovel), at Carpinteria Salt Marsh Reserve. Photo by Ralph Cl evenger

science, art, and community service converge when kids meet in the Carpinteria Marsh "classroom"

Marsha Ota, a kindergarten teacher at Canalino Elementary School, had a vision: to use the outdoors as a classroom for her children. She wanted her children to develop their observation skills and to study earth sciences, physical sciences, life sciences, math, art, and community service. The NRS's nearby Carpinteria Salt Marsh Reserve seemed to offer the perfect environment. Last year, with the NRS as her community partner, Ota was awarded a \$1,000 grant from the Santa Barbara County Office of Education to turn her vision into reality.

Ota began developing a multidimensional curriculum and taking her class on biweekly excursions to the NRS site. Some of the 20 five- and six-year-olds in her kindergarten class had never been to the beach or marsh nor hiked in the

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nearby foothills. Some lived in city apartments, some on ranches, some in semirural areas. But all had a budding interest in science that first began to blossom after Ota brought to their classroom borrowed items from the Santa Barbara Museum of Natural History. The children enthusiastically asked questions, and it was then that Ota realized a hands-on



Carpinteria Salt Marsh Reserve.

experience at the Carpinteria Salt Marsh Reserve could spark a lifelong interest in science and nature conservation. Ota also believes strongly in the importance of the arts in education, so she included watercolor painting and drawing with pastels in the curriculum.

“I want the students to understand that artists, like scientists, are careful observers of nature,” explains Ota in her grant proposal, “and that artists also record their observations and interpretations.”

The goal of Ota’s project was to heighten the children’s observation abilities, using all five senses. The experience, however, exceeded that goal. “The scientific gains truly amazed me,” says Ota. During their trips to the reserve, the kindergartners learned about the habitat and the need for all animals to have food, shelter, and a place to give birth. They learned to classify mammals, birds, fish, and mollusks. The NRS campus office at UC Santa Barbara helped to find local experts — scientists, museum administrators, UC faculty, and graduate students — to meet with the class during their marsh visits to answer questions and to help with hands-on projects.

UC Santa Barbara ichthyologist Andy Brooks met the children at Carpinteria Reserve and showed them how re-

searchers use large nets called “beach seines” to catch fish, including baby halibut, that live in the marsh. Once the fish were captured, Brooks and several UC Santa Barbara undergraduates explained to the children that scientists can often tell where in the marsh a species lives and what types of food it might eat simply by looking at the shape of the species’ body. Brooks also taught the children how to measure the height of the changing tides in the marsh channels.

“The most exciting and, at the same time, the most maddening thing about working with small children is their seemingly inexhaustible supply of curiosity and their unwillingness to accept ‘because that’s just the way it works’ as an explanation,” says Brooks. “One of the major differences between good scientists and great scientists is that great scientists have never lost the ability to see the world through the eyes of a child and ask for the umpteenth time, But why?”

During one early visit to the marsh, Ota asked the kindergartners what types of footprints they saw in the mud. “Many of the kids assumed that the footprints were forest creatures, like eagles or bears,” says Ota. She followed up with an entire lesson on identifying the footprints of the resident herons,

egrets, pelicans, ferrets, foxes, and raccoons.

Mark Holmgren from UC Santa Barbara’s Museum of Systematics and Ecology met with the group and helped them to identify the tracks. Donna Moore from the NRS campus office provided each student with project materials they could cut and fold into a small

book of common animal tracks found at the wetland. They could take the booklet with them on their visits to the marsh to help with their identifications. The students also made plaster casts of the great blue heron’s tracks, which were as big as many of the children’s feet.

Reserve manager and botanist Wayne Ferren along with Jason Nelson, a volunteer with UC Santa Barbara’s Habitat Restoration Club, helped the kindergartners learn to identify plants and explained ideas like what happens when nonnative plants are introduced into a wetland habitat. The children also learned about environmental conservation and damages that are caused by pollution.

On one visit to the marsh, a young boy in the class noticed that his long-lost beach ball was floating in the marsh; apparently, he had kicked it over his backyard fence where it promptly landed in the creek, destined for Carpinteria Salt Marsh Reserve. Ota used the example to explain how creeks and tides can bring in unwanted plants and trash.

Ota was also pleased with the artistic gains her kindergartners made. While the pastels became more of a means for the children to scribble on themselves,

these young students did work successfully with watercolors to create their own paintings, and they worked in groups to create murals of the marsh. Local professional artists taught the concepts of line, color, texture, background, foreground, and horizon. Patricia Morgan, who coordinates the reserve-support group of artists called California Painters of Reserves, worked weekly with the children on their watercolors. At the end of the year, with the help of a Santa Barbara frame shop that matted the paintings at no cost, Morgan staged an art show at a local community center. Many of the kindergartners' parents helped host the show. The children sold their works, earning \$56 that they then donated to Reserve Manager Ferren for other educational projects at the marsh.

The kindergarten wetlands study at Carpinteria lasted five months, rather than the entire school year — cut short by El Niño storms. Nevertheless, the wet winter didn't dampen the quality of the children's experience of the marsh.

"The NRS's Wayne Ferren and Donna Moore made the marsh project a success for my young students," says Ota. "The expert guest speakers generously donated their time to help us discover and understand the marvels of life at the marsh. My children learned that here in their neighborhood they have one of the few remaining marshes left in California — and what an important habitat it is." — PP

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Online guides support wetland lessons at San Joaquin Marsh

Funded by a \$10,000 grant from the Chevron Corporation, Tim Bradley, faculty reserve manager for the NRS's San Joaquin Freshwater Marsh Reserve, and UC Irvine graduate student Marjorie Patrick have created a series of online teaching guides for this wetlands reserve. The guides are designed for teachers of secondary school and beyond, and each one summarizes the ecological and cultural significance of this Orange County site, suggests how to structure discussions, and offers detailed instructions on how students can conduct biological or anthropological experiments and exercises in the field. The guides also list the equipment teachers should bring along, such as rubber boots, shovels, binoculars, and wildlife identification books. Lastly, each guide offers a bibliography of additional readings for teachers.

For example, the teaching guide on the marsh's cattails describes the distribution of *Typha angustifolia* and *Typha latifolia*, explains their special adaptation to anoxic (oxygen-deficient) soil found in wetlands, and shows which other native plants share San Joaquin Marsh. Colorful photographs on the Web site accompany easy-to-follow explanations. The online guides also describe how the Gabrieliño Indians used the marsh and its cattails during the past 2,000 years.

Other guides include curricula on marsh and coastal sage scrub restoration, Native American uses of native marsh plants, plant-insect interactions at the marsh, and information on two salt-tolerant plants: pickleweed and salt grass.

Bradley has applied for further funding from the Environmental Protection Agency, and he is now preparing teaching guides for other NRS sites: Stunt Ranch Santa Monica Mountains Reserve, Carpinteria Salt Marsh Reserve, and Younger Lagoon. He expects these guides will be completed during the next three years.

Bradley and Patrick also created a similar teaching Web page for a Natural Communities Conservation Program (NCCP) site near Irvine. Rather than trying to protect a single species, the NCCP aims to set aside large tracts of land for habitat conservation. The NCCP's outreach component includes Bradley's Web site. Seventh graders throughout the Irvine Unified School District have accessed the site at: <<http://128.200.23.67/Limestone/tablepg.htm>>.

The San Joaquin Freshwater Marsh Reserve teaching guides can be found at: <<http://128.200.23.67/sjfmr/sjfmr.htm#sjr>>. — PP



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SNARL's successful public school outreach program continues with the addition of a library component



NRS Education Coordinator Leslie Dawson teaches second graders at Mammoth Elementary School about forest mammals.

Deep snowfall and cold weather limit the amount of time students and teachers can spend at the Sierra Nevada Aquatic Research Laboratory (SNARL) and Valentine Camp during the winter. But, for 12 weeks each year (six in the fall and six in the spring), children in kindergarten through sixth grade, from Inyo and Mono County schools, board buses destined for SNARL and go to learn about such topics as riparian vegetation, aquatic invertebrates, and stream quality. The field trip program is funded through 1999 by a \$17,000 grant from the Environmental Protection Agency.

Starting in late April and running until school is out for summer break, SNARL hosts two to three classes per day. A \$4,800 grant from the Eastern Sierra Interpretive Association (ESIA) helps pay for the hour-long classroom lessons that complement the field trips. For example, for the first graders, Education Coordinator Leslie Dawson provides an introduction to riparian veg-

etation and teaches the children how to make their own field guides. The children take their guides out to the reserve, identify and measure three species of trees (willow, birch, and aspen) at SNARL, and jot notes on their clipboards. Dawson designs the field courses and classroom lessons to match the school's curriculum; each lesson is appropriate to the age group.

Fifth graders study aquatic invertebrates. Imagine a room full of 11-year-olds simulating invertebrates: Dawson and Sherry Taylor, a member of the reserve's teaching staff, not only watch the kids buzz around as different insects, but teach them about predator/prey relationships. When the students go out to SNARL for the field trip component, they receive a hands-on introduction to identifying aquatic invertebrates. "They go into the creek at two different locations and collect a variety of invertebrates off the rocks," explains Dawson. "They'll have a data sheet and draw a picture of the critter. They'll make field observations of its size, shape, and color. And they have to find the animal in the field guide, including its common and scientific names, and its position in the food web."

As sixth graders, the students return to SNARL to continue experiments and observations along Convict Creek. The kids check the stream's odor and color, then measure the temperature and velocity of the water. Using a table of stream-quality indicators and a calculator, they average the data they've gathered. The kids gain an understanding of water-quality parameters, detecting whether dissolved oxygen in the stream is high, medium, or low.

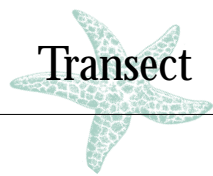
Currently, 2,000 children from 10 schools participate in the field trips and

classroom lessons each year. As a supplement to this program, SNARL has secured \$1,500 worth of donations for a natural science library at the Mammoth Elementary School. The Mammoth Forest Service Visitors Center donated books, videos, and audio-cassettes as part of the ESIA's environmental education program. The library includes such useful references as the Peterson and Audubon guides, and books on history and mining in the region. Dawson says she hopes the library will serve as a pilot program for other elementary schools throughout Inyo and Mono Counties, with each library's contents tailored to the unique natural and cultural history of the town and matched to the curriculum of each school.

Outreach at SNARL and Valentine Camp has many other components. A summer school program brings about 80 students from the cities of Mam-



Seventh grader Patrick McBride holds a trap containing a ground squirrel, captured temporarily for closer examination. Photo by Leslie Dawson



moth, Bishop, Santa Barbara, and Davis out to Valentine Camp to learn about a variety of natural history topics; the curriculum is specialized for children in grades 2 through 9. Classes vary in length from two to three hours per day for one to two weeks, depending on the age group. Class size is limited to 10 students per teacher so that children can receive more individual attention. — PP

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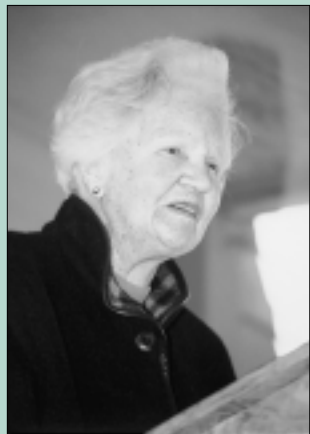
Editor's note: More than half of the NRS's 33 reserves have hosted field trips for primary- and secondary-level students. Some of the K-12 activities that take place at the Sierra Nevada Aquatic Research Laboratory (SNARL), Valentine Camp, and the Carpinteria, Santa Cruz Island, and San Joaquin Marsh Reserves are described in this issue of Transect. Additionally, the following NRS sites, from north to south (by county), act as "classrooms without walls":

- Eagle Lake Field Station (Lassen Co.)
- Angelo Coast Range Reserve (Mendocino Co.)
- Quail Ridge Reserve (Napa Co.)
- Bodega Marine Reserve (Sonoma Co.)
- Jepson Prairie Reserve (Solano Co.)

- Hastings Natural History Reservation (Monterey Co.)
- Landels-Hill Big Creek Reserve (Monterey Co.)
- Sedgwick Reserve (Santa Barbara Co.)
- Coal Oil Point Natural Reserve (Santa Barbara Co.)
- Sweeney Granite Mountains Desert Research Center (San Bernardino Co.)
- Stunt Ranch Santa Monica Mountains Reserve (Los Angeles Co.)
- James San Jacinto Mountains Reserve (Riverside Co.)
- Scripps Coastal Reserve (San Diego Co.)
- Kendall-Frost Mission Bay Marsh Reserve (San Diego Co.)



Retired NRS campus director Henry J. Offen. Photo by Tim Snyder



NRS donor Carol Valentine. Photo by Tim Snyder

Outreach at SNARL/Valentine Camp benefits grown-ups, too

Small-group public tours, advertised through the Mammoth Branch Library, are led several times a year by UC faculty, NRS staff, and university-level students, who discuss the natural history of SNARL and Valentine Camp, two sites administered jointly as Valentine Eastern Sierra Reserve. Every summer an open house at Valentine Camp draws about 225 people; their donations benefit the Mammoth Lakes Hospital Auxillary. Each year from May to July, the reserves hold weekly evening seminars — a series popular with community members interested in what kind of research is underway on site.

Last fall, the reserve celebrated its 25th anniversary. On October 4, a special open house was held at Valentine Camp to honor Henry J. Offen (photo left top), who served from 1972 to 1994 as NRS campus director at UC Santa Barbara, and Carol Valentine (photo left bottom) and the Valentine Foundation for their 1972 donation of Valentine Camp to the University of California. Reserve Manager Dan Dawson hosted the event, while John Melack, faculty reserve manager at UC Santa Barbara, provided an overview of research occurring at SNARL and Valentine Camp, including stream ecology, the diversion of Mono Lake waters, the effects of acid rain on high-altitude lakes, studies of dialects among cowpers (birds), and kinship recognition in ground squirrels.

After more than a quarter of a century of affiliation with the NRS, Henry Offen remains as passionate as ever about the role the reserve system has to play in environmental research, teaching, and public service — and he is confident about its future. “The NRS is here to stay,” he said simply. “It has achieved critical mass.” — PP

Island experience teaches “Learning Through Nature”



Santa Barbara County urban teenagers discovered nature in the wild — and themselves — at Santa Cruz Island Reserve. Their beach cleanup, an unglamorous activity, is nevertheless both necessary and important. Photo by Michael Marzolla

*“I know of a cure for everything: salt water ... sweat, or tears, or the salt sea.” — Isak Dinesen, author of *Out of Africa*, from *“The Deluge at Norderney”**

“I like it here, but it’s so grassy and dirty,” a streetwise teenager commented as she looked around at the grassy hillsides and trees of Santa Cruz Island. The natural world was alien to this teen — as were the concepts of peace and quiet. She was more at home with car alarms and ambulance sirens than with ocean waves and wild turkeys. For teenagers who had never been outside the concrete jungle, spending four days at Santa Cruz Island Reserve was like being abducted and shipped to Mars.

Three years ago, a group of 20 teenagers from Santa Barbara County participated in the four-day *Learning Through Nature*, a project of the UC Cooperative Education 4-H Youth Development Program and the NRS. Armed

with video cameras, rubber gloves, and plastic bags, the group of kids set out for Santa Cruz Island, one of California’s Channel Islands off the Santa Barbara coastline, to undertake a beach cleanup while learning all about the ecosystem and the effects people have on the environment.

“The project is designed to introduce kids to the environment around them and to give them positive things that they can do to make a difference,” explains Michael Marzolla, the 4-H Youth Development Advisor. “For instance, they cleaned the beach and gathered environmental data (such as the volume, type, and origination of the trash), and they shared that information with others.”

“Visiting the NRS station (the reserve’s headquarters) at Santa Cruz Island was the plum of the experience,” Marzolla adds. “It put kids into a place that is very special and not generally accessible

to most people. The kids met the staff, scientists, and graduate students working there, and they received a unique view into what it’s like to do field work.”

All of the kids came from low-income homes, and most of them were struggling at school. The mentoring they received from trained 4-H staff, volunteers, UC scientists, and NRS personnel in this natural setting helped expand their horizons and motivate them to stay in school, says Marzolla.

On the first day of their experiential education excursion, the kids were amazed at the “wildness” of Santa Cruz Island. The teens acted like reserved little adults, says Marzolla. But day by day, as the sunshine, sand, and ocean waves

cleared their inhibitions and discomfort, they began to work cooperatively on beach cleaning and to document their experiences on camera.

“It was rewarding to see the teens making eye contact for the first time, speaking to one another, playing in the water, and just plain enjoying themselves,” Marzolla says.

Learning Through Nature was paid for by a \$5,000 grant from the 4-H Series Program at UC Davis. Marzolla is seeking funding to continue the program at Santa Cruz Island and to re-create it at other NRS sites. — PP

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Docents generate public appreciation of prairie site

The Jepson Prairie Reserve has had a lot to celebrate recently. Abundant and extended rainfall this winter brought a vibrant spring to the vernal pool reserve, with dozens of brilliant wildflower species in bloom. The reserve also celebrated its transfer in stewardship from The Nature Conservancy to the Solano County Farmlands and Open Space Foundation (SCFOSF) on April 19, an event that drew over 400 people to the site near the town of Dixon.

An active season of weekend public tours of the reserve, plus the transfer-of-ownership open house, kept the 50 members of the Jepson Prairie Docent Program especially busy. They also handled their everyday responsibilities of giving school and group tours organized by SCFOSF. Moreover, docents staff most excursions of the “Wildflower Prairie Train,” which runs weekends from late March through mid-May from the Western Railway Museum on Highway 12 to the Old Dozier Station at the northern boundary of the reserve (reservations: 1-800-900-RAIL).

Kate Mawdsley, coordinator of the docent program since 1992 (and a volunteer since 1986), says their membership has grown in size and popularity. There are now enough docents to run a more ambitious public tour program: two tours, instead of one, each Saturday and Sunday. The tours run from early March through mid-May, when the black gnats come out in force, driving away even the thickest-skinned docents and visitors.

Springtime at Jepson is “short, intense, brilliant, and inspiring,” says Mawdsley. “Then, around mid-May, the flowers burn out, becoming dry and brown.” At that point, the tours end.

Last year, the flowers burned out in April, cutting the tour season short by a month. The wet El Niño winter will keep the flowers in bloom a little longer this spring, says Mawdsley, so visitors may still want to take advantage of the reserve’s self-guided trail walk. Jepson Prairie is one of the few NRS sites with a self-guided interpretive trail open during all daylight hours.

A perfect accompaniment to a self-guided reserve tour is hot off the press: a handsome handbook published by the docent program and entitled *Jepson Prairie Preserve: A Native Perennial Grassland & Vernal Pool Habitat*. Underwritten by SCFOSF, the guide describes reserve history, management, and research; its rare and endangered species; its climate, geology, topography, and soils; plant habitats and communities, wildflowers and grasslands; and the variety of wildlife found at Jepson Prairie — invertebrates, fish, amphibians, reptiles, birds, and mammals. The guidebook is easy to read, well designed and illustrated, and includes a list of recommended readings. Copies are available for \$10 from SCFOSF (707-428-7580).

The Jepson Prairie docents work cooperatively with UC Davis faculty and reserve managers. Each February, docents undertake thorough in-class and field training on reserve history, flora and fauna, soils, and current research and management issues. The classes are taught at UC Davis by experienced docents and guest lecturers, including Robbin Thorp, professor emeritus of entomology and the reserve’s faculty manager. Three weekend field trips complete the training. Mawdsley says outreach at Jepson Prairie includes informing the public about the roles of the NRS and SCFOSF, and explaining

the value of the prairie as a research site. In particular, the docents describe work being done to restore native grasses and habitats, and research on grazing, burning, and management of invasive species.

Faculty Manager Thorp praised the Jepson Prairie Docents, saying they “play a key role in generating and fostering public interest in the natural history of the vernal pool ecosystem. We are fortunate in having an active corps of volunteer docents, willing to share the lore of vernal pools and the surrounding upland habitat with the large number of visitors entertained each wildflower season.” — PP

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—or—

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Robert Holland, local botanist and ecologist, does his impression of 19th century, pioneering botanist Willis Linn Jepson, for whom Jepson Prairie was named. Photo by Kate Mawdsley

Big Creek hosts extended learning in wildlands study

One of the many unique aspects of the NRS is that its reserves are available for use by universities around the world, across the country, and throughout the state. Each summer for the past four years, the Wildlands Studies Program at San Francisco State University (SFSU) has offered a two-week, three-credit course using the Landels-Hill Big Creek Reserve on the Big Sur coast.

The course, *Field Studies in Biology*, is offered through SFSU's College of Extended Learning. Deidre Sullivan, who teaches it, is also an instructor of earth sciences at Hartnell College in Salinas, as well as the curriculum and industry manager for the Marine Advanced Technology Education Center (MATE) at Monterey Peninsula College (MPC).

She teaches this field class because “students lose a lot of interest in science early on when we teach them abstract theories and mathematical formulas in the classroom without the basic field observations to accompany them.”

Sullivan co-teaches the wildlands study course at Big Creek Reserve with MATE program director Nicole Crane, an instructor of life sciences at MPC. Sullivan, a marine geologist who specializes in mapping the habitat of California's coastal ecosystems, says Big Creek offers a rare opportunity for students.

“It's one of the few places you can go and find a pristine environment. It's a well-balanced ecosystem, so students get to see much more diversity. There's a healthy mountain lion population; we see their marking spots and their tracks all over the place.”

The course description reads something like what you would find in a catalogue of environmental expeditions or adventure tours — but at far, far less cost (\$485):

Team members will take part in exciting onsite ecological investigations of the redwood forested canyons and rugged coastal environments ... the Big Sur coast is one of the most spectacular and dynamic stretches of coastline along the west coast of North America ... elevation gains of over 5,000 feet, pristine streams with sensational waterfalls, and a rich shoreline home to thousands of marine mammals ... the geology of the region is just as breathtaking as the wildlife with hot springs, gem-quality jade that can be beachcombed, and a dramatic history to tell of a region once formed on the sea floor then subducted to great depths only later to be uplifted by dynamic tectonics that today creates this showcase of an ever-changing environment...

No wonder the course fills up each summer. The course is offered twice each summer, with each session limited to 12 students.

The goal of the two-week course is to provide the students with a heightened awareness of the principal ecosystems of Big Sur and some of the pressing conservation issues facing the region. Throughout the course, the students work together in teams, write papers (without the aid of computers), and give presentations around the campfire.

“The students learn how to make observations, how to do sampling, how to analyze their data, recognize patterns, and make associations,” explains Sullivan. “It takes time to do all of this, but they are enthusiastic. They become critical thinkers. No matter what career they choose, field courses teach students how to ask questions.”

Hands-on field explorations include assessing the abundance and behavior of marine mammals, including sea otters and seals; investigating stream habitats; and surveying and mapping plant and animal communities in the intertidal zone and on the reserve. Strenuous hiking along the rugged Big Sur cliffs, snorkeling, and camping out are part of the wildlands experience.

Students aren't required to have previous fieldwork experience; Sullivan and Crane will teach them field biology and geological methods. Reserve Manager John Smiley teaches fire and plant ecology. Reserve Steward Feynner Arias-Godenez and Education Coordinator Kim Smiley also participate in the program.

The program brings in researchers from other agencies, such as the U.S. Forest Service and the California Department of Fish



Students monitoring steel head trout in Big Creek. Photo by Deidre Sullivan

and Game, who assist with stream hydrology and steelhead trout surveys. One project last year brought in fly fishermen to the protected reserve for research purposes. The fishermen taught the students how to flyfish and capture steelhead. Students learned how to take fin clips from the steelhead that would later be used for DNA analysis. The government agencies have a limited number of field biologists to cover large regions, says Sullivan, so the data collected by the SFSU course help them as well.

According to Reserve Manager Smiley, hands-on field courses, such as this one, make a large impact on students. And, he notes, “the program gets students to contribute real research data.” He praises the course as “scientifically rigorous and immensely satisfying for the students” and says: “I wish more students could get this type of training. It would help us as a society, in making practical, compassionate, and wise decisions about how to get through the next century and beyond. It would also help us to find ways to preserve and restore wilderness to the American landscape.” — PP

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Editor's note: University extension courses can be a fine way to learn about and experience some NRS reserves, such as James San Jacinto Mountains Reserve in Riverside County (contact: Reserve Manager Michael Hamilton, 909-659-3811) and San Joaquin Freshwater Marsh Reserve in Orange County (contact: UC Irvine Extension Office, 949-824-5414 — and ask about classes taught at the marsh).



In the wilderness, a helicopter can be the fastest way to evacuate a sick or injured person. Photo courtesy of Out There, Inc.

Wilderness medics teach “staying alive” at James Reserve

Much of the stewardship that concerns the NRS reserves focuses on how we can take better care of our environment and its resources. At the James San Jacinto Mountains Reserve in Riverside County, people also have an opportunity to learn how to take better care of themselves in the environment.

Five to six times each year, wilderness first aid courses are taught at the James Reserve by OUT THERE, Inc., an Idyllwild-based organization that specializes in experiential education program development and conference and retreat planning. This year, for 40 days, OUT THERE will use the James Reserve for its Wilderness Advanced First Aid (WAFA) and its Wilderness First Responder (WFR) courses, which are taught by instructors provided by the Wilderness Medical Association (WMA), based in Bryant Pond, Maine.

Most of the courses are taught by WMA instructor John Jacobs. The advanced first aid is a 36-hour, four-day certification course, while the wilderness first responder is a 72-hour, eight-day course. OUT THERE offers the courses as a community service, charging just \$345 for the WAFA and \$695 for the WFR — less than \$100 per day, catered cuisine included. Each course has a capacity of 25 students.

Why choose the James San Jacinto Mountains Reserve as the training site? Staff Reserve Manager Michael Hamilton answers this question: “The James Reserve and the surrounding national forest area is topographically, environmentally, and vegetatively diverse, providing instructors many potential wilderness simulation scenarios that are representative of environments and conditions ranging from desert to subalpine. For the same reasons that the reserve is appropriate for a variety of field biologists, our landscape provides a stimulating and realistic location to train teachers, outdoor guides, and field workers in this all-important facet of our work — staying alive.”

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Course participants come from a range of backgrounds and experience. "At our recent Wafa course in November, we had students from California, Utah, Colorado, the Pacific Northwest, a veterinarian from Cleveland, kayak guides from the Aleutian islands, and a mountaineering guide from Africa," explains Jim Zuberbuhler, who directs OUT THERE and has, as a volunteer, spent 10 years on the Idyllwild Mountain Rescue Team. Most students range in age from 20 to 60 and include wilderness guides, mountain rescue team personnel, outdoor enthusiasts, and, occasionally, nurses and doctors.

"Backcountry first-aid scenarios often require caregivers to work with limited resources, slow or no transportation, and nothing more than a first-aid kit," Zuberbuhler says. "There is no 'golden hour' out there." *Golden hour* is a term used in the medical field, referring to a patient's enhanced chances of survival if he or she reaches a hospital within one hour of sustaining a trauma or other medical emergency. But time in the backcountry is measured in days, not hours, says Zuberbuhler. The students practice solving three crucial problems: (1) how to locate and/or recover the patient, (2) how to help the patient survive, and (3) how to get the patient to advanced medical care.

Each course includes practice assessing a patient's condition, responding to simulated accidents, and sophisticated role playing. Among the conditions simulated are head-on collisions, hypothermia, bone breaks, insect and snake bites, illnesses, high-altitude conditions, and a variety of other medical problems, including personal medical crises (such as heart attacks and diabetic comas).

Some people may question the appropriateness of using an ecological reserve

for what might be viewed as simply an outdoor recreation activity. Again, Reserve Manager Hamilton answers the question: "We have found the OUT THERE staff very sensitive to their environmental impact, and they respect areas we have designated for research purposes. They also offer their courses during our least active time of the year (late fall and winter) and when fragile or sensitive species are dormant or seasonal. My staff and I feel our ability to respond to medical emergencies is greatly enhanced due to what we have learned from the OUT THERE curriculum."

The next Wafa course is November 20-23; the next WFR courses are August 18-26 and December 1-9. — PP

For more information, contact:

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when the wilderness is your workplace, you must be able to handle accidents in the field. Photo courtesy of Out There, Inc.

Editor's note: Many people are unaware of the opportunities the NRS offers groups interested in learning about California's wildlands. Many NRS sites invite use by community and environmental organizations, government agencies, private businesses, and ecologically minded volunteers. A few allow self-guided walking tours. Thousands of public users visit our reserves each year. The following list describes a few of the public access opportunities presented by the NRS.

- *Hastings Natural History Reservation (Monterey Co.) offers occasional public seminars and holds an open house every other year. The next open house will be held in 1999. Contact: Reserve Manager Mark Stromberg, 408-659-2664.*

- *An annual count of rare grasses is held at Jepson Prairie Reserve (Solano Co.), usually in July, an event coordinated with the California Native Plant Society. Contact: CNPS/Jepson Prairie volunteer Carol Witham, 530-753-5872. Other NRS sites host similar flora and fauna counts by environmental groups.*

- *San Joaquin Freshwater Marsh Reserve (Orange Co.) offers tours during UC Irvine's open house ("Celebrate UCI"). Contact: Reserve Manager Bill Bretz, 714-824-6031. Tours are also offered when the UC Irvine Arboretum holds public events. Contact: 714-824-5833.*

- *While the NRS site on Año Nuevo Island (San Mateo Co.) is not open to the public, Año Nuevo State Reserve on the mainland, offers guided walks. Call for recorded info: 650-879-0227; for further details: 650-879-2025.*

- *Angelo Coast Range Reserve (Mendocino Co.) encompasses 23 miles of trails open daily, from sunrise to sunset, with no prior notification necessary. A guide to the trail walks is available in the reserve's visitor kiosk. Contact: Reserve Steward Peter Steel, 707-984-6653.*



Public access enhanced at Carpinteria marsh

The public will enjoy enhanced access to Santa Barbara County's popular Carpinteria Salt Marsh — and the entire ecosystem will get a boost — when work is completed on the “Carpinteria Salt Marsh Enhancement Project for the Ash Avenue Wetland Area.” The project is expected to be finished later this summer.

A new nature trail, a marsh overlook, an interpretive center and kiosks, and a teaching amphitheatre will all benefit the public. Plans for the project also include public restrooms and a life-guard facility.

Although this project does not increase the size of the 120-acre NRS reserve within the 230-acre marsh, it does add 15 acres to marsh itself — acres that were originally coastal salt marsh habitat, but later filled in during local development. Digging out soil, restoring natural grades, excavating channels, and replanting native wetland species make up the restoration component of the Ash Avenue project.

The project goes back over 10 years to 1987, when the California Coastal Conservancy, City of Carpinteria, Land Trust for Santa Barbara County, and the NRS's Carpinteria Salt Marsh Reserve first began to coordinate efforts, which included the purchase of six marsh properties from 17 different landowners and required an overall budget of approximately \$4.5 million.

For more information, contact:
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Reserve Manager
Carpinteria Salt Marsh Reserve
UC Santa Barbara
Phone: 805-893-2506
E-mail: ferren@lifesci.lscf.ucsb.edu

Many thanks to the Packard Foundation

The NRS will be able to expand its activities in environmental research and education thanks to a \$4-million endowment received June 11 from the David and Lucile Packard Foundation.

Earnings from the endowment will support new and renovated laboratories and lodgings, equipment, and environmental monitoring at NRS sites throughout the state. This will enable the NRS to continue to attract and retain top-notch researchers and to expand its public education and outreach programs.

The Packard endowment is the largest single private gift ever received by the NRS and among the largest endowments ever received by the University of California. It is a positive starting point for NRS's decade-long, \$33-million capital campaign, now in the works, and lays the cornerstone for our successful future development.

The Natural Reserve System depends on financial support from the University of California, foundations, and many other sources, including individuals. Gifts and grants, designated for the NRS or any of its 33 reserves are always welcome and may be sent to:

Julie Monson
Special Assistant for Development
Natural Reserve System
UC Office of the President
1111 Franklin Street, 6th Floor
Oakland, CA 94607-5200.

Stunt Ranch joins in Earth Day Outreach

The Stunt Ranch Santa Monica Mountains Reserve, in Los Angeles County, had cause for celebration when Earth Day '98 coincided with the 20th anniversary of the Santa Monica Mountains National Recreation Area.

The most dramatic event of this year's Earth Day was the “Hands Across the Parklands” in which 10,000 people held hands to form a human chain along Mulholland Highway from Dirt Mulholland to the Pacific Coast Highway. Stunt Ranch Reserve was designated a “Discovery Site” along the route.

The reserve offered public tours of the Stunt High Trail, led by the Cold Creek Docents, and invited scientists from UC Los Angeles to explain their research in such areas as the archaeology of the Santa Monica mountains, communication and foraging behavior of the western scrub jay, the ecology of horned lizards, and noninvasive tracking of wild carnivores. The Cold Creek Docents, who coordinate K-12 outreach at Stunt Ranch, also gave instruction in acorn grinding, cave wall painting, and Chumash games.

Hands Across the Parklands was sponsored by the Santa Monica Mountains Fund, the national and state Park Services, the Santa Monica Mountains Conservancy, state and local legislators, neighboring schools and businesses, and individuals.

For more information, contact:
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and Community Outreach
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Santa Monica Mountains Reserve
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Message from the VP-DANR

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lighted in these pages, including opportunities for learning along the coast of California (pp. 1, 6) and in the Sierra Nevada (p. 4). Adult learning is enhanced through formal coursework, often provided by our non-UC sister institutions (p. 8), or by volunteers who help us communicate widely the wonders of our sites (p. 7). Outreach activities range from teaching people survival skills in primitive settings (p. 10) to making our sites more accessible, both physically (p. 11) and electronically (p. 3).

We are proud of the important progress our NRS sites and people have fostered in research and understanding of our environment. We are equally pleased that the University of California can participate in programs that bring the beauty of nature to so many people, while unraveling the mysteries of science for them.

The NRS is an extraordinary public asset. We are committed to its care and wise use. We are delighted that the Packard Foundation has significantly enhanced our ability to fulfill that commitment with a generous endowment

gift (p. 11). We intend to build upon their encouraging support to develop a continuing base for NRS programs and sites.

Transect was created to bring information about the NRS to our users and friends. We welcome suggestions for the newsletter and ideas about our programs in general.

— *W. R. Gomes*
Vice President

Agriculture and Natural Resources

We have moved!

The systemwide office of the Natural Reserve System, along with most of the UC Office of the President, has moved within the City of Oakland from the Kaiser Building near Lake Merritt to the University's new building across the street from busy City Center Plaza. Our new address in beautiful downtown Oakland is:

Natural Reserve System
University of California
Office of the President
1111 Franklin Street, 6th Floor
Oakland, CA 94607-5200

Phone and fax numbers, as well as e-mail addresses, remain the same.

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Recent *Transect* issues are also available for viewing on the World Wide Web at: <<http://nrs.ucop.edu>>

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