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In this issue:

- Funding Opportunities (p. 7)
- New Personnel (p. 3)
- Bighorn Sheep Study (p. 2)
- Elephant Seal Study (p. 2)

Thoughts from the Vice President-ANR:**A Time of Change for NRS**

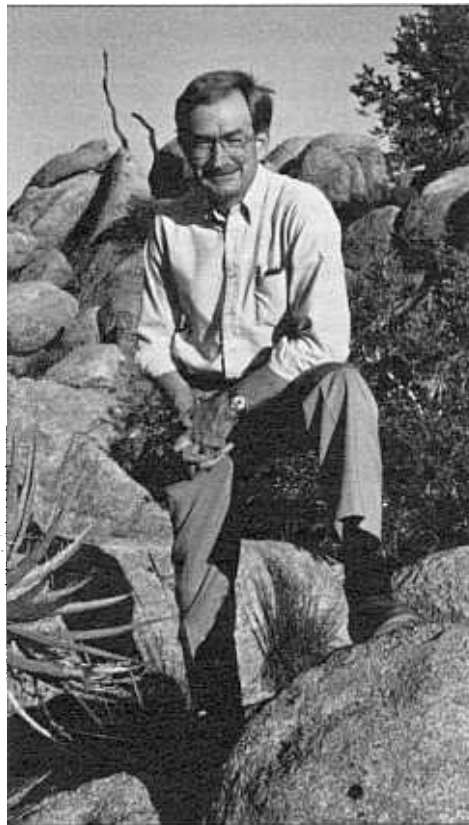
In the past two decades, agriculture and natural resources have been influenced by a variety of social forces that have given rise to new and complex needs for research and education. To improve the University's development and delivery of new knowledge on today's issues, the Division of Agriculture and Natural Resources is being reorganized. The first phase, which deals primarily with the Agricultural Experiment Station and Cooperative Extension, took effect January 1.

One of the programs being affected by reorganization is the Natural Reserve System, the University's principal academic resource for the study of natural systems. Over its more than twenty years of growth, the NRS has earned international recognition for its remarkable richness of habitat diversity.

The NRS is currently at an important transition point between its acquisition and operational phases. Though additional sites need to be acquired to complete the System's habitat representation, resources must also be focused on developing its support facilities and academic program.

The NRS is also undergoing several changes in leadership. After 20 years at the head of the System, J. Roger Samuelsen will be leaving the position of Director upon the appointment of his successor. He will continue his involvement with the University,

continued on page 6

Samuelsen Reflects on NRS Directorship

J. Roger Samuelsen visiting the Burns Piñon Ridge Reserve in the Mohave Desert.

J. Roger Samuelsen has had a career-long association with the University of California. After graduating from the Berkeley campus in 1958, he earned his law degree at Berkeley's Boalt School of Law. During his student years, he performed a variety of short-term assignments for the Office of the President. Beginning with Robert Gordon Sproul, he has worked for six different presidents.

In 1967, Samuelsen joined the President's Office full-time as Coordinator of Special Projects. His early assignments included providing staff support for the President's Council of Chancellors, for the UC Alumni Association, and for the then-two-year-old Natural Reserve System.

He was named full-time Director of the NRS in 1974. Under his leadership, the System has grown to encompass 27 sites, more than 93,000 acres, and over 150,000 user-hours per year. In 1984, he assumed additional responsibilities as Special Assistant to the Vice President—Agriculture and Natural Resources. In this capacity he undertakes fund-raising, property negotiations, and special projects for the Division.

After more than 20 years, Samuelsen will be leaving the NRS upon the appointment of his successor to become full-time Special Assistant to Vice President Farrell. He reflects on his involvement with the Reserve System in this interview for the Transect with Sarah Gustafson.

Q. You've shepherded the NRS from an ambitious dream to an internationally renowned system of natural reserves. How does it feel to be directly responsible for developing such an educational legacy?

A. While I appreciate the implications of the question, it is not quite accurate to say I am directly responsible. Were it not for the inspiration, impetus, and leadership of Ken Norris and Mildred Mathias, among other faculty members, there would never have been a Reserve System as we know it today. It has truly been a team effort, and my own participation has been very satisfying.

One doesn't have too many opportunities to follow a dream all the way to a tangible

continued on page 6

We've Moved!!

The systemwide office of the Natural Reserve System, together with the other Berkeley-based units in the Division of Agriculture and Natural Resources, has moved. Our new address and phone number are:

Natural Reserve System
University of California
300 Lakeside Drive, 6th floor
Oakland, California 94612-3560
(415) 987-0150
ATSS 567-0150

Reserve Highlights



Cathy Chilcott

desert bighorn sheep (*Ovis canadensis nelsoni*)

State and Students Study Bighorn Sheep

The Granite Mountains Reserve has established a cooperative program with the California Department of Fish and Game (CDFG) to study the area's desert bighorn sheep. The program provides an opportunity for senior undergraduates from UC Santa Cruz to gain practical field experience while collecting data crucial to the management of this interesting species.

The students are working under the direction of Vernon Bleich, an associate wildlife biologist with CDFG, and Dr. John Wehausen, a research associate at UC's White Mountains Research Station. For several years, these scientists have worked on projects to relocate and re-establish healthy herds of bighorn in the desert mountains within the historic range of the animal.

Sheep populations began to decline in the mid-1800s due to unregulated market hunting, diseases transmitted from livestock, and usurpation of water sources. Bleich and Wehausen hypothesize that the continuing presence of livestock is a factor in the currently depressed status of some populations. In studies of bighorn from mountain ranges bordering the Granites, they've been quantifying the demographics of the sheep in areas with and without diseases commonly associated with domestic livestock.

The Granite Mountains' herd probably exists as a meta-population—a subset of a larger, intermixing population—with gene exchange from range to range due to sheep dispersal. Cattle have been present in the

Granites for many years, hence its population should show the effects of diseases, if any are present. Based on data from an initial four animals tested, however, the herd looks surprisingly disease-free.

As the faculty sponsor of the cooperative program, I've been working with Reserve personnel to set up projects documenting the Granites' bighorns and assessing their critical habitat. Last summer, UCSC undergraduates Mike East and Jim Berkey began mapping trails used by sheep and cattle, documenting sheep sign, and—most importantly—locating and assessing waterholes used by sheep in the June-July dry season.

This spring, East and fellow intern Jef Jaeger will continue the project in coordination with CDFG. In addition to studying the habitats on the western end of the range, East and Jaeger will train with CDFG personnel working in the next range to the north to learn how to track sheep using radio telemetry. We hope to eventually radio-collar some of the Granite Mountains sheep to obtain data on home range, movement patterns, and reproductive success.

With this information, the Reserve will be able to address issues regarding the sheep in preparing its management plan. The data will also be of value to public agencies in their efforts to understand the bighorn well enough to ensure its long-term survival.

This cooperative project will hopefully last for several years and involve many student interns. It is the very kind of collaborative work with implications for management as well as for scientific research that our reserves are most suited to promote.

*Maggie Fusari, NRS Academic Coordinator
UC Santa Cruz*

Editor's note: In order to track the Granite Mountains' bighorn sheep with radio telemetry, the Reserve needs to purchase collars and an antenna-receiver system at a total cost of \$3,000. If you'd like to contribute, contact Fusari at the Division of Natural Sciences, University of California, Santa Cruz, CA 95064, (408) 429-4971.

NIH Funds Research on Elephant Seal Apnea

Heavy snorers and infants at risk for Sudden Infant Death Syndrome (SIDS) may get help from a new research project on elephant seals at the Año Nuevo Island Reserve.

"Elephant seals are the best examples of animals that hold their breath while they sleep," says Dr. Mike Castellini, a research biologist at the UC Santa Cruz Long Marine Laboratory. "Even as pups they can breath-hold for eight minutes at a shot." Castellini recently received a five-year \$330,000 grant from the National Institute of Heart, Lung, and Blood to study how seals withstand prolonged, repetitive apneas without apparent stress. His work could have important applications for treating sleep-related breathing disorders in humans.

"We're looking at how the metabolism adjusts to vast oscillations in amounts of oxygen in the blood," says Castellini. From January through April, he collected data from 10 to 15 pups. With standard sleep monitors used in human studies, he charted each seal's heart rate, blood chemistry, and brain waves during the dozen or so apneas it underwent in one night. After the seals left the Island in May, he began analyzing the data and planning next year's field season.

Like all diving species, elephant seals have several adaptations for building up oxygen in their blood and muscle tissues. This allows them to hold their breath for extended periods, while underwater or on land. Castellini hopes to refine what is known about these physiological adaptations. "When an animal dives, it has the conflicting oxygen demands of breath-holding and exercising," he says. "By studying a mammal that breath-holds while asleep on land, we should be able to get a better handle on the effects of oxygen deprivation itself."

Such information could eventually help humans who experience sleep apnea, clinically defined as a period of more than 10 seconds without breathing. Adults with this disorder, viewed by some as an exaggerated form of snoring, undergo at least 30 apneas a night, often awaking with a startle. In addition to disrupting sleep, the repeated stress can cause heart problems. In infants, the results may be more drastic. The signal to breathe somehow gets short circuited, and the child never starts to breathe again. Sleep apnea is thought to be a major factor in SIDS, which strikes some 7,000 infants each year in the United States alone.

"We want to know what signals elephant seals to wake up and resume breathing," says Castellini. "If we can figure that out, and if the systems are similar enough, perhaps the seal signal can be used on humans."

*Sarah Steinberg Gustafson, Editor
Natural Reserve System*

Reserve Personnel

NRS Stewards Keep Reserves in Good Repair

Question: What has 22 arms, four B.A.'s in biology, a great deal of construction experience, and is available 'round the clock?

Answer: The NRS cadre of reserve stewards and caretakers, which has almost doubled in number in the past three years.

These skilled and devoted people are one of the System's most valuable resources. And though many have similar duties on paper, the diversity of the sites on which they work make each one's job unique.

Don Bolda has been maintaining the **Philip L. Boyd Deep Canyon Desert Research Center** in the Coachella Valley for three years. He brings a background in construction to his job keeping the station in good repair, collecting weather data, and occasionally assisting with field work.

Bolda took over these duties from **Mark Fisher**, who began working at Deep Canyon in the fall of '83. Now the staff biologist, Fisher monitors the Reserve's transects, collects and records weather data, does some administrative and construction work, and assists the reserve director in a study of the Coachella Valley fringe-toed lizard (see *Transect*, 4(2):4). In his free time, Fisher illustrates the area's plants and animals.

For four summers, **Scott Christensen** has worked at **Valentine Camp**, just east of Mammoth Mountain. He spends most of his time removing human and domestic animal trespassers, doing trail work, maintaining the site's buildings, and representing the site to the University and local community.

Christensen has a background in carpentry, which he still pursues during the winter months. For the last two winters, Christensen has lived in a cabin on site, keeping the reserve secure in exchange for housing.

Evan Goldblatt and **Frank Murphy** will share the stewardship of the **Landels-Hill Big Creek Reserve**, located along the rugged Big Sur coast, until June. They maintain the site's buildings, roads, and trails, assist researchers and field classes, and have restored many of the facilities destroyed by the 1985 wildfire (see *Transect*, 4(1):1). Goldblatt and Murphy live in a cabin on site.

Goldblatt began working at Big Creek in early '85 and will be leaving the Reserve this summer to pursue his musical interests. He's been known to serenade guests at his remote cabin with an electric guitar hooked up to a solar-powered 12-volt amplifier. Murphy, who's been at Big Creek since September, will be starting graduate work in geography at UC Berkeley this fall.

The newest reserve caretakers are **Beth Hendrickson** and **Steve Silvers**, who've helped administer and maintain the **Coal Oil Point Reserve** since February in exchange for housing on site. Silvers is responsible for securing the site from trespassers, while Hendrickson oversees research and has begun coordinating the removal of exotic plants. Together, they also educate the public about this urban reserve located on the west campus of UC Santa Barbara.

Both caretakers are graduates of UC

Berkeley. Hendrickson is now a master's student at UCSB in plant ecology, as well as president of the campus Botanical Society. Silvers, who has a background in psychology, works as a residential counselor for the Devereux Foundation, a private nonprofit center for adolescent males.

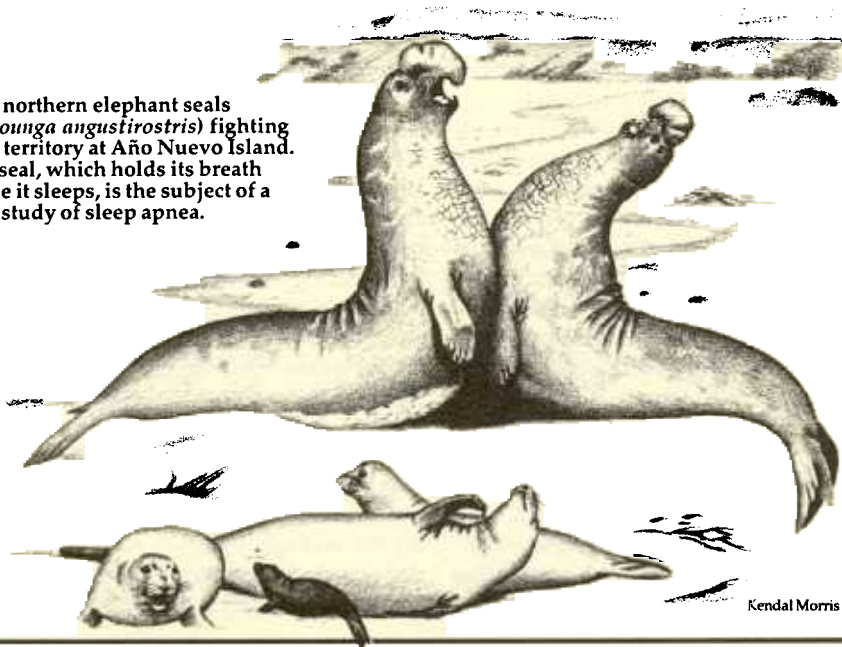
At the **Bodega Marine Reserve**, half-time Steward **John Maron** coordinates research, participates in a variety of long-term monitoring programs, and is setting up the weather stations and grid system recently funded by the National Science Foundation (see *Transect*, 6(1):2). Though only on the Reserve staff since last spring, Maron has done field work at Bodega for many years, starting with his master's research on sanderlings. For the past three years, he has also co-taught a Reserve-based summer course in marine and coastal ecology.

Tom Neuer brings a great deal of experience in construction and knowledge about energy conservation to his position as roving steward for all of the **Riverside Campus reserves**. His NRS involvement began in the fall of '85, when he became the steward for the **James San Jacinto Mountains Reserve** near Idyllwild. Last summer, the job expanded to encompass UCR's six other reserves as well. His recent projects include remodeling the Trailfinders Lodge at the James Reserve, designing a prototype radio communications system for the Granite Mountains Reserve, and installing solar systems at James and the Granites.

Scott Roripaugh keeps the **Sierra Nevada Aquatic Research Laboratory** at the base of Mount Morrison in good repair, helps on-site researchers, and handles some of the billing. He began his job last July and served as acting reserve manager from November to April, while the regular manager was on sabbatical. Before coming to SNARL, Roripaugh worked on a construction crew at the White Mountains Research Station, an organized research unit operated out of UC Los Angeles. He shoes horses on the side.

At the **Hasting Natural History Reservation** in upper Carmel Valley, **Suzanne Schettler** "tries to keep as many things fixed as possible." Schettler, who has lived and worked at Hastings for three years, maintains the site's buildings, roads, vehicles, and ancient plumbing system and keeps the Reserve's weather data. A self-taught botanist, Schettler had her own landscaping business for many years before coming to Hastings. She is currently vice president of the California Native Plant Society.

Bull northern elephant seals (*Mirounga angustirostris*) fighting over territory at Año Nuevo Island. The seal, which holds its breath while it sleeps, is the subject of a new study of sleep apnea.



Reserve Personnel *continued*

Planning Races Ahead

"I view my job as setting up the infrastructure for good long-range planning," says Dr. Margaret Race, who joined the NRS as Acting Director of Planning and Program Review on February 1. Her primary charge is to develop the background necessary to formulate the strategic plan called for by Vice President Farrell. Though the bulk of the planning process awaits the arrival of a new NRS Director and the appointment of a Strategic Planning Committee, Race hopes her work will allow the planners to "focus on the issues, rather than the process."

According to Race, the purpose of a strategic plan is to answer fundamental questions about the NRS and its relationship to University users and external groups. "It's not the same as budget, operational, or management planning, which are already happening throughout the Reserve System," says Race. "The committee will be re-examining the NRS mission in light of changes in external factors such as the University and state budgets, public awareness of conservation issues, and land encroachment."

In addition, Race will be working with the Office of the President to develop an initiative through the UC budget process for obtaining permanent funding to operate and maintain the NRS.

To this crucial position Race brings an unusual combination of education, academic and administrative experience, and communication skills. She received a Ph.D. in zoology in 1979 from UC Berkeley, where she studied population biology of marine intertidal invertebrates. After a postdoctoral year at Woods Hole Oceanographic Institution, Race became a faculty member in Stanford University's Human Biology Program, which focuses on both the basic sciences and their policy implications. In 1984, she returned to UC as a science policy analyst with the Division of Agriculture and Natural Resources. In that capacity she has dealt with such issues as agricultural salinity and drainage, environmental release of genetically engineered micro-organisms, and hardwood range management.

Though she left traditional academia to become more involved with the policy side of science, Race still views herself as an educator. "I'm interested in how you get scientific information into the policy process in a form that is useful for answering questions like which way to vote or how to structure public programs," she says. "Basically, it's

translation and communication of science—and that's teaching."

With respect to the NRS, Race hopes to facilitate the reserves' role in formulating public policy. "The system is unique in its potential to help the world manage natural resources," says Race. "With the proper structure and budget behind it, the Reserve System can be used to answer important questions that can't be answered anywhere else."

Ferren Now Manages Carpinteria Reserve

Wayne R. Ferren became the manager of the Carpinteria Salt Marsh Reserve on December 1, formalizing his decade-long research and management interest in this estuary 20 miles east of the Santa Barbara campus.

Ferren, who received his M.A. in plant ecology from Rutgers University, joined the UCSB herbarium in 1978, where he is now Curator. He soon became involved in research on the entire Carpinteria Marsh. UC's 130-acre Reserve sits in the middle of this 230-acre wetland that involves some 15 landowners and 20 public agencies and conservation organizations. In his new capacity, Ferren will represent UC's concerns as he helps orchestrate the completion of an estuarywide management plan. "I feel like my role right now is in politics more than anything else," says Ferren. "It's an important part of managing an urban reserve."

But Ferren is also involved in the site academically. "I'm specifically interested in the unique aspects of estuaries in Mediterranean environments," he says. "Carpinteria Salt Marsh has some of those special attributes, and it's one of the few estuaries in Southern California with upper marsh habitats that support rare native annual species."

In 1985, Ferren published *Carpinteria Salt Marsh: Environment, History, and Botanical Resources of a Southern California Estuary* (see *Transect*, 4(1):7). He is currently coordinating preliminary studies of the Marsh's fish and mollusks, as well as the vegetation and its relationship to physical factors. He hopes these projects will lead to a comprehensive monitoring program of the site's physical environment and biological resources. "As manager," he says, "my goal is to have all on-site research address issues that will be important to the long-term management of the estuary, in addition to contributing to the science of estuarine wetlands in general."

Stromberg Heads Hastings Reservation

"I've known of the Hastings Natural History Reservation for a long time through the zoological and botanical literature," says Dr. Mark Stromberg. "I've always thought of it as supporting excellent work." As its Resident Manager since April 18, Stromberg is now in a key position to enhance and perpetuate this Reserve's strong reputation.

Stromberg's first priority is to focus on administrative and management issues. Working as a liaison between Hastings and the UC Berkeley Museum of Vertebrate Zoology, which administers the site, he will be developing a management plan and supervising the construction of the lab recently funded by the National Science Foundation (see *Transect*, 6(1):2). After the planning and building process is well underway, he also intends to begin some on-site research.

Stromberg has a great deal of experience in both managing natural areas and doing research on them. After receiving his Ph.D. in zoology from the University of Wisconsin in 1979, he joined The Nature Conservancy (TNC) as Director of the Heritage Program for Wyoming. Next he worked out of TNC's Denver office as the Rocky Mountain Land Steward, overseeing the management of 31 properties in Wyoming, Colorado, and New Mexico. In 1983, he became Resident Director of the National Audubon Society's Appleton-Whittell Research Ranch Sanctuary, an 8,000-acre station in the northwest foothills of Arizona's Huachuca Mountains.

"Through these jobs, I've gotten involved in a lot of collaborative research projects," Stromberg says. "I've published work on swift foxes, endangered plants, and acid rain, and am currently working on Montezuma quail and taste perception in hummingbirds." He also co-authored *The Mammals in Wyoming*, published by the University of Kansas Museum of Natural History.

Stromberg, his wife, Barbara, and their two children live at Hastings. A medical technician, Barbara looks forward to pursuing her career in nearby Carmel Valley.

Stromberg will also use his experience as a father in assessing the potential for the Hastings Reservation to help local schools with environmental education. "I don't want kids to leave elementary school thinking that zoologists work in zoos," he says. "I also want to help promote good community relations by sharing the site's resources."

News and Notes

Events

IUCN General Assembly Meets In Costa Rica in February

Nearly 1,200 conservationists, scientists, and agency personnel attended the 17th General Assembly of the International Union for the Conservation of Nature and Natural Resources (IUCN) in San Jose, Costa Rica, from February 1-10. NRS Senior Environmental Planner Jeff Kennedy, who attended the meeting as a member of the IUCN's Commission on National Parks and Protected Areas, filed this report.

The IUCN, an independent organization with more than 600 members from 117 countries, promotes and carries out scientifically based action for conservation. This largest-ever General Assembly was timed to assess midpoint progress in meeting the IUCN's 10-year action plan.

The most remarkable trend in evidence at the meeting was the evolution of concrete, feasible mechanisms for the active collaboration of ecologists with economists and conservationists with development financiers to put conservation and sustainable development on a sound financial footing. For example, the World Bank's recent Wildlands Policy integrates conservation and biodiversity preservation into its development funding process and discourages funding for projects with unacceptable impacts. Debt-for-nature swaps provide a tool to reduce the Third World's crushing foreign debt while implementing major conservation projects with local currency.

Perhaps most exciting of all, the proposed

International Convention on the Conservation of Biodiversity develops the legal and administrative framework to make the financing of conservation sustainable. It would establish an international fund to collect royalties from users of genetic resources for commercial purposes—such as pharmaceutical companies, plant propagators, and seed companies—and disperse the monies to signatory nations for the study and conservation of the world's genetic heritage. The proposed treaty should provide considerable incentives for scientific research, particularly in developing countries.

Another notable trend was the increasing recognition of the importance of conservation science and its cousin, restoration ecology, in providing a sound, objective foundation for conservation action and land use allocation. In that context, Kennedy will be heading up a joint task force of two IUCN commissions to develop guidelines for the use of parks and protected areas for research and monitoring. For further information, contact Kennedy at (415) 987-0150.

Davis Campus Will Host AIBS Meeting this Summer

The 39th American Institute of Biological Sciences (AIBS) Annual Meeting of Scientific Societies will be held August 14-18 at UC Davis. Fifteen affiliated societies will hold meetings concurrently, providing a forum for effective exchange of information among the life science disciplines.

In addition to contributed papers and poster sessions, the meetings include symposia, workshops, special lectures, and scientific field trips. Among the 26 field trips

is one sponsored by the Ecological Society of America (ESA) and the Society for Economic Botany that will visit the Bodega Marine Laboratory and Reserve on Friday, August 19. Also of note is a workshop titled "The Content of Long-term Biological Data Sets," sponsored by the Association for Tropical Biology and ESA. Former NRS Associate Director C. Ronald Carroll is coordinating this forum scheduled for Sunday, August 14.

For further information, contact: AIBS Meetings Dept., 730 11th Street N.W., Washington, D.C. 20001-4584, (202) 628-1500.

Cranston Visits the Granites

In November, Senator Alan Cranston visited the Granite Mountains Reserve as part of a fact-finding mission in the Eastern Mojave Desert. Last year, Cranston introduced in Congress the California Desert Protection Act of 1987, which would designate about two-thirds of California's desert lands as national parks or wilderness areas. Cranston was accompanied by his son, an aide, and representatives from the Wilderness Society and the Sierra Club. The group stayed overnight at Pinyon Camp in Granite Cove.

Contributions and Additions

Hastings Gains a House

In March, the University purchased 3.7 acres adjacent to the Hastings Natural History Reservation, bringing the size of this site to 2,002 acres. Located in the Upper Carmel Valley, Hastings contains a variety of interior central coast range habitats. It is the site of many long-term research projects, including a 17-year study of the evolution of social behavior in acorn woodpeckers. The addition includes a single family residence that will be used to house the Reserve's new resident reserve manager, Mark Stromberg, and his family (see p. 4)

Mottes Add to Rimrock Reserve

The Motte Rimrock Reserve grew by 10 acres this winter, thanks to a gift of land from Charles L. and Oattie Mae Motte. Located on the western edge of the Perris Valley, this site is dominated by coastal sage scrub and contains a number of well-preserved aboriginal pictographs. The recent addition brings the core of the Reserve to 460 acres.



Peg Herring

Looking north across the Bodega Marine Reserve in Sonoma County. The Reserve and Laboratory—shown in the background—are the destination of one of this fall's AIBS Meeting field trips.

News and Notes *continued*



Artist Paul Gavin paints the San Joaquin Freshwater Marsh Reserve with the Irvine campus in the background. Limited editions of the watercolor were recently presented by the UCI Alumni Association at its annual Lauds and Laurels Awards Ceremony to people who have provided distinguished service in a variety of categories.

A Lot of Help from Our Friends

In addition to the gift of land mentioned above, several public and private sources have contributed funds to the Natural Reserve System in the past year. Among the major contributors are:

Chevron Corporation—\$10,000 for the Landels-Hill Big Creek Reserve toward a cabin at the proposed Reserve field station and a brochure describing the site.

California Department of Parks and Recreation—\$10,000 to James San Jacinto Mountains Reserve Director Mike Hamilton to develop a remote sensing database for the Department.

Pacific Southwest Forest and Range Experiment Station—\$10,000 to James Reserve Director Mike Hamilton to refine and expand the computerized geographic information system he has developed for mapping fire hazards and fuel loading in the San Jacinto Mountains.

Security Pacific Foundation—\$2,000 in unrestricted funds.

The Natural Reserve System depends on such funds for many of its resources and programs. We are grateful to all our contributors for their generous support.

Change *continued from page 1*

however, as my full-time Special Assistant. A nationwide search for a new NRS Director is underway by a committee composed of George A. Bartholomew, UC Los Angeles; Deborah Elliott-Fisk, UC Davis; Richard E. MacMillen, UC Irvine; Mildred E. Mathias, Universitywide NRS Faculty Advisory Committee; Joe R. McBride, UC Berkeley; Henry W. Offen, UC Santa Barbara; and Seymour D. Van Gundy, UC Riverside.

Dr. C. Ronald Carroll, former Associate Director of the NRS, became Associate Director of the Institute of Ecology at the University of Georgia on February 1. During his two and a half years with the NRS, Carroll developed the foundation for a variety of academic programs on the reserves. Carrying on his momentum is Dr. Margaret Race, who became Acting Director of Planning and Program Review for the NRS on February 1 (see page 4).

In order to assess the needs of the NRS and determine its direction during this important transition period, I am seeking input from a variety of sources. Last fall, I received the report of an external review committee composed of Daniel H. Janzen (University of Pennsylvania), Donald E. Stone (Duke University, Organization for Tropical Studies), and Thomas O. Pritchard (Nature Conservancy of Wales), all well-known and highly respected biologists with extensive experience in the study and management of natural resources.

The review and design process will continue with the evolution of a strategic plan for the NRS, in concert with the strategic planning effort underway for the entire Division. Race has begun developing the background material and policy analysis necessary for this planning process.

As it undergoes this period of growth and change, the NRS will continue to contribute to our fundamental understanding of the natural environment. It will also play an increasingly important role in the development of the knowledge base needed to ensure wise stewardship policy for our state's natural resources.

But the NRS is much more than a research unit. As outdoor classrooms, the reserves make major contributions to many facets of environmental education. In doing so, they aid in the development of an enlightened citizenry composed of people who are both sensitive to the need to conserve our natural resources and knowledgeable about rational management for their sustained use.

I have been greatly impressed by the quality and dedication of the staff, reserve managers, faculty advisors, and many others

who have transformed the NRS from a good idea into a unique program with a strong foundation and a great deal of momentum. Their contributions ensure the continuing success of the Natural Reserve System as a major academic resource of the University. I want to assure you that such success is my goal as well.

*Kenneth R. Farrell, Vice President
Agriculture and Natural Resources*

Samuelsen *continued from page 1*

product. In some ways, the System has come further than we ever thought possible in just over 20 years. At the same time, there's still much to be done. I suppose, like a proud father, I'm going to be watching from afar the NRS grows and prospers in the future.

Q. What do you view as your most important accomplishment for the NRS?

A. In general, I'd say keeping the program going in the late sixties and early seventies when the idea of anything growing was unheard of. There were periods when we thought we might have to fold up our tent and go home. But when you're negotiating for property or cultivating donations, you can't just turn it on or off. I'd like to think a major accomplishment was keeping the wheels turning, but doing so with a full understanding of the fiscal and political crisis the University was undergoing.

Q. What other aspects of the job have been particularly satisfying to you?

A. My satisfaction comes from playing a facilitating, enabling role. I think a parallel might be drawn with preparing an eight-course meal for a large group of people. You have to plan ahead, prepare things carefully, and put the food on the stove so that everything comes to the table on schedule and in proper sequence.

In a similar way, developing the NRS—particularly acquiring properties—has involved a number of factors and people, including landowners, donors, staff, the General Counsel's Office, the Treasurer's Office, the campus that will administer the site, and the faculty who will be using it. My job has been to pull all the pieces together and forge a consensus so that proposals are presented to the President and the Board of Regents in a timely manner. All told, I've "served" more than 100 Regents Items to the Board.

Q. In doing so, it seems you've dealt with a great variety of people. Do any interactions stand out in particular?

A. One definite high point was spending 24 hours at the Landels-Hill Big Creek Re-

serve with a group of students from the Santa Cruz campus. I experienced firsthand, almost as a student myself, what and how they were learning from their stay there. That evening I spoke before a campfire about the origins of the Reserve and told them a bit about the people who had made it possible. In their naiveté, the students were somewhat surprised to learn that the Regents, the former owners, the donors, and the other parties involved all shared the students' love and respect for the land, and that this was the motivating factor behind the acquisition, not personal or business gain.

I mention this because being with students in the field has been tremendously exciting. It has given me a chance to experience the "end product" of our efforts and to put those efforts into perspective.

Q. You noted earlier that much work remains to be done. What do you see as the most important short-term goals?

A. I think the first and foremost goal has to be to secure a permanent base of operational support. If I have any disappointment, it's that we've not been able to achieve that in 20 years. We just have to if we're going to continue to fulfill our obligations.

Secondly, we've found that the full utilization of reserves is largely dependent upon there being adequate on-site personnel and support facilities. Development in this area is definitely on the list of goals.

I would also like to see the stimulation and coordination of academic programs on the reserves by offering grants, sponsoring conferences, facilitating collaboration between researchers from several sites, and continuing to make the availability of our resources known through our publications program.

Fourthly, I would add completing negotiations on the remaining core reserves, particularly in Northern California. Also important will be identifying and acquiring "resource lands"—examples of habitats we do not have in the System now—as additions to the core reserves.

Q. That's a pretty big order. Do you have any advice for your successor?

A. I would suggest being patient, realizing that transactions involving the University do take time. I would also suggest keeping the long-term objectives foremost in mind and, hopefully, avoiding preoccupation with short-term crises that tend to distract from achieving those objectives.

But most of all, I'd advise being grateful for the opportunity to serve a growing, enterprising, stimulating program, and in the process, working with an outstanding group of dedicated individuals, both inside and outside the University.



Carey Stanton at his home on Santa Cruz Island.

In Memoriam

The Natural Reserve System lost a devoted friend and supporter on December 8, 1987, with the death of Dr. Carey Q. Stanton, President of the Santa Cruz Island Company and principal owner of Santa Cruz Island.

With Carey's encouragement, the Santa Barbara campus held its first summer geology courses on the island in 1963 and 1964. The ventures were so successful that a field station was established in 1965. In 1972, Carey consented to an expanded agreement that provided for use of significant portions of the island under the auspices of the Natural Reserve System.

The center of operations for the University is a prefabricated building that can house upwards of 20 students and researchers at a time, along with four trailers containing a wet laboratory, darkroom, small library, conference room, and quarters for long-term senior researchers.

Fortunately, the long-term preservation of Carey's portion of Santa Cruz Island has been assured through an agreement he reached in 1978 with The Nature Conservancy, a private, nonprofit preservation organization. In effect, TNC now becomes our landlord. With the compatibility of our objectives and the history of successful cooperative ventures at the Landels-Hill Big Creek and Jepson Prairie Reserves, among others, this augurs well for the future.

We will miss Carey. We will miss his wise counsel, his insistence on detail and decorum, his protectionist spirit. We will miss his intense interest in students and researchers and their quest for knowledge—a quest Carey shared. He was a gracious and generous host to the University over the years, and we will always be in his debt for affording the educational experiences that he did.

J. Roger Samuelsen, Director
Natural Reserve System

Funding Opportunities

NSF: Undergraduate Research

A 1986 report of the National Science Foundation (NSF) documented that active research experience is one of the most effective techniques for training undergraduates for careers in mathematics, science, and engineering, and that too few such experiences are now available. The NSF has established the Research Experiences for Undergraduates Program (REU) to help meet this need, particularly for women, minorities, and disabled students. Researchers conducting work at NRS reserves may wish to apply for REU funding to enhance the involvement of undergraduates in field research.

Two categories of REU grants are planned: *Site Grants* involving at least four and optimally eight students, preferably within the scope of a single discipline or department, and *Supplements* to ongoing NSF grants to enable undergraduate involvement. Projects may be carried out at any time of the year, and grants may last for one, two, or three years. REU awards are expected to average \$4,000 per student for Site Grants, somewhat less for Supplements, and may include stipends for students, salaries of involved faculty, relevant student housing costs, indirect costs, and a modest allowance for supplies.

The deadline for Site Grants is in late November; applications for Supplements are accepted at any time. Guidelines are outlined in NSF publication 87-63. For more information, contact the REU Program, Office of Undergraduate Education, Directorate for Science and Engineering Education, Room 639, National Science Foundation, Washington, D.C. 20550, (202) 357-7051.

Whitehall Foundation: Neuroscience and Behavior

The Whitehall Foundation assists science faculty in areas of basic biological research that are not heavily supported by federal agencies or other foundations with specialized missions. Current areas of interest are invertebrate neurophysiology, behavioral neuroscience, and ethology. The foundation offers both research grants of up to three years at \$10,000 to \$40,000 per year and grants-in-aid of \$10,000 for one year. Applicants should initiate the proposal process by writing a letter of intent, which will be accepted throughout the year. For further information, contact: Whitehall Foundation, Inc., Suite 202, 249 Royal Palm Way, Palm Beach, Florida 33480, (305) 655-4474.

Opportunities *continued*

Lindbergh Fund: Environmental Work

The Charles A. Lindbergh Fund supports individuals whose proposed projects represent a significant contribution toward the achievement of a better balance between technology and our human and natural environment. Grants of up to \$10,580 will be awarded in categories including conservation of natural resources, oceanography / water resource management, and wildlife resource management. The deadline is October 15, with awards announced the following May. For a grant application, contact: Charles A. Lindbergh Fund, Inc., Grants and Awards Office, Box O, Summit, New Jersey 07901, (201) 522-1392.

Hardman Foundation: Botanical Research

The Hardman Foundation supports evolutionary and conservation research through two programs offering grants of \$500 and \$1,000. Academic grants are available to graduate students and possibly undergraduates or faculty for research projects in systematic botany that contribute to the understanding of evolutionary development or regional plant variation within species or species complexes. Also available are applied use grants for practical experimentation in native plant propagation and non-native weed extirpation. Academic status is not required for the latter.

The deadline for both types of grants is November 15. For more information, along with a grant application form, contact: D. A. Hoover, The Hardman Foundation, Inc., P.O. Box 6171, Woodland Hills, CA 91365-6171, (818) 887-7877.



Publications

Guide to CSU Resources

In December, the Wildland Resources Center published *Wildland Expertise and Facilities in the California State University System*, a directory of CSU faculty and staff involved with California's 83,000 million acres of wildlands. The publication is designed to increase cooperation among researchers, particularly between the UC and CSU systems. It was compiled by Robert Z. Callaham, Wilmer L. Colwell, Jr., Clinton B. Phillips, and Alan G. Stangenberger.

This 108-page document consists of four parts. The first three parts offer departmental affiliations, statements of interests, and keywords for each of the 224 individuals listed. The fourth part describes some specialized facilities for teaching and research related to wildlands.

The directory is available at no charge from the Wildland Resources Center, 145 Mulford Hall, University of California, Berkeley, CA 94720, (415) 642-0263.

Get Your New Brochures Here

A brochure on the James San Jacinto Mountains Reserve recently came off the press. Designed for prospective reserve users, this publication describes the natural resources of the site and contains information on access, facilities, and use.

Also available are brochures for Año Nuevo Island Reserve, Bodega Marine Reserve, Hastings Natural History Reservation, Philip L. Boyd Deep Canyon Desert Research Center, Pygmy Forest Reserve, Ryan Oak Glen Reserve, San Joaquin Freshwater Marsh Reserve, Santa Cruz Island Reserve, and Valentine Camp. Contact the systemwide NRS office for free copies.

Free Subscription

tran • sect (tran'sekt), *n.* 1. *Field Science.* A line along which physical and biological data are collected. 2. *Tech. Slang.* A cross-sectional slice of the environment under study.

In a broad sense, the Natural Reserve System is also a transect. It encompasses a cross-section of California's natural diversity in a system of natural areas and field stations specifically reserved for teaching and research. Recognizing this, we have chosen to call our award-winning newsletter the *Transect*. For back issues or a free subscription—two issues per year—write or call the systemwide NRS office.

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