This, my third year as Chair, has seen our progress continue. As you may recall, last year’s newsletter described several major new initiatives. We received: funding from NSF for a “Research Experiences for Undergraduates” program to provide opportunities for students to be involved in research activities at our LTER site; funding from AT&T for a computer lab for undergraduates; two NSF Research Instrumentation for Minority Institutions (RIMI) awards; and a large award from the Howard Hughes Medical Institute.

As you might imagine, getting all of these programs up and running in an expeditious fashion has required a lot of effort and cooperation from our faculty. I am happy to report that our Department has met the challenges involved with making the adjustments necessary to accommodate these major new endeavors—all four of these programs are now fully functional.

This year we are pleased to report the addition of a program that helps minority undergraduates develop careers in environmental biology. In a nutshell, what all this means is that our ability to meet the needs of all of our undergraduate students in today’s world is vastly improved, as compared to just a year or so ago. This issue reports on some of these programs, and we invite you to come by to see for yourself the advances we have made.

The faculty, as always, have been busy with their research. Dr. Terry Yates’ work in Bolivia, Dr. Cliff Crawford’s work with the Rio Grande bosque, and Dr. Bud Riedesel’s research into hyperhydration are featured in this issue.

I should emphasize that the Department of Biology is one of the strongest on the UNM campus for one simple reason. We have a group of faculty and staff who insist that our programs become and then remain first-rate. In this issue we feature one of our emeriti faculty members and one of our staff members who have made a big qualitative difference to our Department. I thank our members for their dedication and hard work as well as each of you readers for your interest in and support of our programs!

As I wrote last year, it is a privilege to serve as Chair of this group.
Dr. Terry Yates, working with a grant from the National Science Foundation, spent almost four months conducting research in Bolivia on an ongoing project entitled "Mammalian Diversity in Bolivia: The Yungas and Valles." More than 25 individuals participated in this year's fieldwork, including Dr. Scott Gardner (UC Davis); Dr. Joseph Cook (Univ. of Alaska); Dr. William Moore (Wayne State Univ.); Dr. Jean Pierre Hugot (The National Museum of France); Dr. James Rieger (USAID Washington); Drs. Pablo Marquet and Donald W. Dusznyski (UNM); Museum of Southwestern Biology Collections Manager Bill Gannon; UNM biology graduate students Jorge Salazar-Bravo, Travis Perry, Marcelo Zalles and Mariel Campbell; UNM biology undergraduate students Melissa Chavez, Jon Dunnum, Suzy Peurach and Tom Seaton; and eight Bolivian students. The trip was an exceptional success and brings to a total of five the altitudinal transects that have been sampled across Bolivia by this group. Bolivian mammals and their parasites have been sampled in a standardized fashion at 500-meter intervals from altitudes ranging from 500 to 4,000 meters. These data are being used in assessing the mammalian diversity of the country and in numerous systematic, biogeographic, parasitological and coevolutionary studies.

This ongoing research has provided the data necessary to support a major part of the research program of Dr. Yates and his co-PI and former student, Dr. Cook. It also has provided a research forum for five PhD dissertations, two master's degrees, and countless research projects for undergraduates. This program has helped to make UNM an international center for research and education in biological diversity.

Second Annual Research Day

The department’s second presentation of undergraduate and graduate student research, organized again by Dr. Kathryn Vogel, was held in April of this year. Dr. Mimi Koehl of University of California at Berkeley, was the guest speaker; her topic was "The Fluid Dynamics of Hairy Little Legs: Feeding, Smelling and Swimming," referring to her study organism, the copepod Calocalanus bavo.

This year’s event featured 33 posters and 10 talks. The poster judges refused to decide on first or second place winners among the outstanding posters, so five “first” place prizes were awarded to Matthew Crawford, Rayna Gonzales, Melissa Hankin, Colleen Hatfield and Michele Merola. For talks, the first-place award went to Robert Cabin; second-place was shared by Sandra Merino and Tze-Hei Yong. A reception was held at the end of the day at the UNM Maxwell Museum of Anthropology.

Financial support was again provided by the La Jolla Cancer Research Foundation.
MSB Recent Activities

BOLIVIA & SCIENCE EDUCATION.
Through a major supplement to Dr. Terry Yates’ Bolivia grant from the NSF (see p. 2), local high school students were able to take part in this exciting project by spending the summer in the Museum of Southwestern Biology’s Division of Mammals and Division of Biological Materials. Nine high school students and three of their teachers from three area schools spent two months conducting research on Bolivian mammals. Four of these students will continue to work in the MSB throughout the school year, and the teachers are now working with Dr. Yates to develop curricula that will incorporate systematics, biodiversity and conservation material into secondary science education. UNM graduate students Bill Gannon, Jennifer Frey, Lisa Valle, Eduardo Palma and Jennifer Miyashiro provided guidance and instruction to this group in topics ranging from computerized mapping and biochemical techniques, museum management to the use of the library.

PROJECTS IN BIOLOGICAL DIVERSITY.
Closer to home, new research projects in biological diversity have been funded at Kirkland AFB, Cannon AFB (near Clovis) and the Forked Lightening Ranch in the Pecos. The awarding of these projects from the Dept. of Defense and the U.S. Park Service to UNM reflects the growing national concern over the rapid loss of biological diversity, the premier reputation of UNM scientists in these areas, and the importance of the extensive data bases of the MSB collections. All of these projects have in common a survey and inventory component that will provide a baseline of data to be used to address other questions. For example, research on the Kirkland AFB project will address questions on the effects of grazing on small mammals and plant communities. The Cannon AFB project will assess all vertebrate and plant communities and employ geographic information system technology.

THE HANTAVIRUS HUNT.
UNM biologists have also played a central role in activities associated with the Hantavirus outbreak. The MSB has been designated as the official federal repository for voucher specimens resulting from the Hantavirus research by the Center for Disease Control. Jennifer Frey, one of Yates’ graduate students, is currently cataloging and verifying identifications on specimens collected this past summer. The frozen tissue collections of the Museum’s Division of Biological Materials may well hold the key to solving the mystery of whether this is a new virus or if it has been in New Mexico for some time. The first grant monies for UNM biologists were received for collaborative research on the virus and its deer mouse host. Of course, field crews have been affected—the LTER mammal and parasite crews were required to work in the Sevilleta heat with gloves, face masks and gowns so as to avoid the virus.

PERSONNEL CHANGES AT THE MSB.
The US Fish & Wildlife Service (USFWS) has had a presence in the MSB since the mid-1970s. Last year, Dr. Norm Scott vacated the position here in a move to another USFWS station along the Central California coast. Long-time administrative secretary Rayann Robino also relocated to a more attractive position in downtown Albuquerque. We will greatly miss their expertise, energy and friendship!

Simultaneously with the USFWS reorganization under the National Biological Survey, the USFWS transferred Dr. Mike Bogan and Collections Manager Cindy Ramotnik to the MSB. These two fine people bring along their expertise in mammals and other vertebrates and their museum collections—some 20,000 mammals and 4,000 birds have arrived, with herpetiles and fish to follow next summer. This increases the MSB holdings considerably; the Mammal Division alone now has nearly 100,000 specimens, elevating its rank to the third largest university collection in the US. We welcome Mike and Cindy and the continued USFWS presence in the department.

Ornithology Division Bequest

R. Robert W. Dickerman, who was appointed a Curatorial Associate of the Museum of Southwestern Biology in 1988, recently made a most generous financial contribution to the MSB’s Division of Ornithology. Bob has been a well-known figure in the ornithological community for many years. Since coming to New Mexico and joining our department, he has made major contributions to the holdings and organization of the bird collections. Thank you, Bob, for all you’ve done for the Museum’s Ornithology Division!
The Hughes Undergraduate Research Program

The Department of Biology's Hughes Program is now in its second year of a five-year grant funded by the Howard Hughes Medical Institute (HHMI) through their Undergraduate Biological Sciences Education Program. During the past year, the Hughes Program purchased $130,000 of state-of-the-art molecular and cellular research equipment, including a spectrophotometer and two thermocyclers. This equipment is being used in the Hughes-funded laboratory classes and is also available for use by students in the RIMI lab.

Four students were awarded stipends during the Spring 1993 semester. These students presented their research at the Second Annual Research Day and visited several projects at the Los Alamos National Laboratories. They hosted a seminar featuring Dr. John Trotter, a Professor of Anatomy, an Associate Professor of Cell Biology, and an adjunct professor in our department. They also invited four students from Valley High School in Albuquerque to visit the UNM campus, the Medical School and the Biology Department.

Fifteen students participated in the 1993 Summer Program. Eight of these students were from UNM, with other students representing Cal State Northridge, Harvard, Colorado State University, UC Santa Barbara, Pomona College, Case Western Reserve and Nebraska Wesleyan University. The students worked full time for ten weeks on individual research projects, including fungal molecular biology and genetics, extracellular matrix biochemistry, microbiology, fertilization and early development, parasitology, methane oxidation, nitrogen fixation, thermoregulation, and environmental physiology. They visited the Los Alamos National Laboratories, the LTER Sevilleta Field Station, met with several guest speakers, and presented their research at an all-day Mini-Symposium held jointly with REU students from the LTER Program. The summer was very successful for the students as well as for the faculty mentors, who include Drs. Oz Baca, Larry Barton, Cliff Dahn, Gordon Johnson, Sam Loker, Don Natvig, Mary Anne Nelson, Bud Riedesel, Steve Stricker, Eric Toolson, John Trujillo, Maggie Werner-Washburne and Kate Vogel (who submitted the original proposal to the HHMI). Dr. Vogel continues to serve as the director of the program; Drs. Loker, Natvig and Nelson provide help, and Robyn Côte-Schmader gives administrative support.

The purpose of the Hughes program is to increase the number of undergraduate students who pursue postgraduate research education and to encourage careers in the biomedical sciences by providing hands-on lab experience in cellular & molecular biology.

There are currently six Hughes students in the 1993-94 Academic Year Program, with a seventh student scheduled to join the program in the Spring 1994 semester. In addition to their research, the students are organizing two brown-bag seminars each semester to inform other undergraduates of the opportunities for research at UNM.

HHMI has now invested $204 million in 197 programs in colleges and universities throughout the country. Dr. Vogel attended the HHMI's Annual Program Directors meeting in Chevy Chase, Maryland, in October 1993. She was impressed by their newly constructed facilities as well as by the high degree of interest and enthusiasm for education expressed by the other Program Directors.

Two topics were addressed during this conference that seemed particularly relevant to UNM. First, how can the changes in undergraduate education attitudes and practices be institutionalized so that they don't just stop when HHMI funding ends? And second, what is the real goal of an undergraduate education in biology? Although not everyone will become a practicing scientist, there are endless careers for which a scientific education is an excellent preparation—teaching, business, law or politics. We would like to hear from alumni who have used their biology education to develop careers in fields not usually identified as scientific. Our students would like to know what you have done, and how it happened. Please send your comments to Robyn Côte-Schmader, Administrative Assistant, Hughes Program, Department of Biology, The University of New Mexico, Albuquerque, NM 87131-1091.

December 1993
The REU Program

The Sevilleta Research Experiences for Undergraduates (REU) Program, sponsored by the NSF with a $148,000 grant to Drs. Ann Evans and Bob Parmeter, continues to grow as it enters its fourth year in 1994.

During the summer of 1993, the REU program involved 16 students in ecological research projects in association with the Sevilleta Long-Term Ecological Research (LTER) Program in central New Mexico. The Sevilleta LTER site provided REU students with a unique opportunity to examine ecological processes at the boundaries of several major southwestern biomes: Chihuahuan Desert, Great Plains Grassland, Great Basin Shrub-Steppe, Interior Chaparral, Pinion-Juniper Woodland, Montane Coniferous Forest, and Sub-Alpine Forest/Meadow. The REU Program capitalized on the diversity of the 21 LTER faculty, who collaborate on a wide array of scientific studies in meteorology, botany, zoology, paleoecology, parasitology, watershed dynamics, nutrient cycling, and landscape ecology.

The goals of the Sevilleta REU program are to instruct undergraduates in the principles of scientific research; expose them to a wide variety of ecological research techniques; facilitate their individual research projects; and encourage them to continue their scientific education in upper-division courses and graduate school.

To accomplish these goals, Biology faculty developed a coordinated program that includes:

- orientation meetings & a seminar series devoted to the scientific opportunities in ecological research at the Sevilleta,
- faculty-student one-on-one instruction of hypothesis development & research protocols in ongoing LTER projects,
- field & laboratory experiences in sampling & data collection,
- implementation of individual student research projects, carried out under the guidance of student-selected faculty members,
- an REU Symposium for project presentations by the students,
- attendance at an annual meeting of the Ecological Society of America,
- preparation & submission of project manuscripts to scientific journals.

These activities integrate all theoretical and technical aspects of the LTER and promote a holistic approach to large-scale ecological studies. Both students and faculty look forward to another great REU program in 1994.

Career Development for Minority Undergraduates

UNM is a federally-designated minority research institution, and is dedicated to increasing the educational levels of minority students.

With the support of a 4-year, $245,000 grant from the NSF, the Biology Department faculty are establishing a Career Development Program in Environmental Biology for minority undergraduate students. This new program will bring students into an extended one-on-one relationship with research ecologists from UNM, Sandia National Laboratory, the US Fish and Wildlife Service, and the New Mexico Museum of Natural History & Science.

UNM Biology Department faculty members Drs. James Brown, Cliff Dahm, Donald W. Duszynski, Ann Evans, Gordon Johnson, Tim Lowrey, Diane Marshall, Bruce Milne and Terry Yates, along with James Brent, Dr. Carl White (UNM Biology Department), Dr. Kit Matthew (the New Mexico Museum of Natural History & Science), and scientists from collaborating organizations, have pledged their time and expertise to the new program.

The program will support ten minority undergraduates at any given time. Each student will select one or more faculty members to be their research mentors during their program. Students will gain personal experiences in not only the research projects in the area of their immediate interest, but also in other ecological projects conducted by the UNM faculty.

The program will include academic and career counseling, and a structured educational component (in addition to their standard classwork) that will encompass practical and theoretical aspects of the scientific method, hypothesis development and testing, experimental and statistical design, implementation of independent research projects (chosen by the students in consultation with their mentors), computerized data management, and the preparation of project results for oral presentation and a written journal manuscript.

December 1993
Behind the Scenes
(& Nearly In the Basement)

Ask Beth Dennis why she enjoys working in the Department of Biology, and she says, "The diversity and the people." Ask why she became an artist, and there is a long, thoughtful silence.

Beth has been the Biology Department’s half-time Graphic Designer and Scientific Illustrator since 1985. She and her current work-study assistant, Aimee Reese, prepare illustrations, graphics, maps and charts for the department faculty and research staff. Her work is published in professional scientific journals, books and lab manuals, and appears in slide/poster presentations and public relations material.

"There weren't any art classes in the schools where I grew up, so my mother arranged for me to take lessons from local crafts-women—basketmaking, painting, that sort of thing. I took my first art school class at Wharton County Junior College, in Wharton, TX. Morna Nation was my instructor for most of the classes, and she is still a friend. My family always implied that I saw things a bit 'differently,' and Morna taught me how that quality is respected and encouraged in art."

Beth transferred to Sam Houston State University in Huntsville, TX, and graduated in 1973 with a BFA in Advertising/Graphic Design. She studied most forms of arts and crafts: classical drawing and painting, calligraphy, intaglio, lithography, serigraphy, design, illustration and drama, ceramics, weaving, macramé, woodworking, sculpture, photography, jewelry/metalwork, and art law (whew!!).

In 1976, Beth moved to New Mexico, where she has supported herself as an artist since. At UNM, she studied botany with Dr. William C. Martin, and ecology with Drs. Loren Potter and Bruce Milne. These courses included Flora of New Mexico, Fleshy Fungi, Agrostology, Advanced Plant Taxonomy, and Ecology of North American Deserts and Grasslands.

In Santa Fe, she studied at the Museum of Indian Arts and Culture, where she learned Hopi overlay from Harvey Quaminpetewa, and Zuni channel inlay from Harlan Coonsis.

Beth began specializing in scientific illustration in 1984 when she illustrated and self-published a set of postcards on native plants. "Plants, and their uses, have always interested me. I have the patience to examine and record the details under a microscope. I have backpacked extensively in the Southwest, and I like knowing the plants around me." Her aware, however, hasn't been limited to plants. For the department, her illustrations have ranged from fruit fly habitats to cicadas, from bat caves to the bosque, and much more.

The B. Dennis Company was founded in 1986 to handle outside work. Her clients have included Dr. Roger Conant (Snakes of the Agkistrodon Complex), UbikSound, ArtSpace Magazine, art in the school, inc., The Lepidopterists’ Society, Plants of the Southwest, Jack Carter/Colorado College (Trees and Shrubs of New Mexico), and the U.S. Fish and Wildlife Service (The Middle Rio Grande Ecosystem: Bosque Biological Management Plan).

Beth has been recognized throughout her career by a variety of awards, exhibits and articles. These include Who's Who among Students in American Junior Colleges (1971); Award of Acceptance in the Dallas/Ft. Worth Society of Visual Communications Annual Student Show (1973); Honorable Mention in the Newspaper/Magazine Category of the American Public Transit Authority's Annual AdWheel Awards (1980 & 1981); and a Certificate of Appreciation from the Distributive Education Program at Rio Grande High School (1981). Her work has been exhibited in the Fuller Lodge Art
Center in Los Alamos (1991), The Governor's Gallery in Santa Fe (1988), and the Columbus Art Center in Columbus, TX (1989). An article on Beth and others in the Governor’s Gallery show was published in IMPACT, the Albuquerque Journal Magazine in May, 1988.

Naturally, Beth continues to hone her skills, learning through long hours of study and practice. She currently works in watercolor, pen and ink, pencil, and silver. While most of us know Beth as an artist, not many of us recognize her as the organic gardener, herbalist, motorcyclist, mechanic to her '74 VW Beetle, carpenter, seamstress, natural foods cook, horsewoman, ammunition reloader, photographer, and advanced student of T’ai Chi Chuan.

Asked why she stays with the Biology Department, Beth replies, "That became clear for me when I was interviewing for another job. It was a real graphics department, with the latest equipment and subscriptions to the best graphics magazines . . . everything an artist could hope for. But when I was leaving the interview, I realized what was missing: none of those artists had ever worked with a recovering cactus wren nestled in the crook of her arm. Their work-study students never brought in sagebrush from the Chaco country just to have the scent of something wild in the office. They had never experienced the hilarity of some faculty members throwing multi-colored pasta on the hall floor to see 'if it would work' to illustrate a point in a lab . . . . It just wasn’t me."

We are indeed fortunate to have so talented, dedicated and energetic an individual in the department. It was a pleasure. Beth goes beyond what’s asked; she makes suggestions for improvements to folks like me who have no innate artistic talents."

—Dr. Ann Evans

"Beth has been an invaluable member of the staff. She does quality work. She is very knowledgeable about journal formats and has saved me both time and expense with her valuable suggestions and comments. We are very fortunate to have her!"

—Dr. Astrid Kodric-Brown

"I consider Beth’s talents an invaluable departmental resource. Give her some funds and very professional things emerge—a good example being the graduate student recruitment poster produced a couple of years ago!"

—Dr. Sam Loker

"Beth is one of the most important resources in the department. She is among the best illustrators with whom I have worked. We should recognize how lucky we are to have her working for us."

—Dr. Tim Lowrey

"Beth can take a rough sketch or a vague photograph and convert it into a professional piece of art. Her insight and artistic talents result in illustrations which highlight important issues. I’ve never had one of her illustrations rejected by an editor."

—Dr. Bud Riedesel

"Beth takes her work very seriously. Her work is of the highest quality, and she conducts it with the utmost professionalism and responsibility. She always strives for realism and accuracy in her work. She has often made creative suggestions about how to improve the presentation of my material."

—Dr. Randy Thornhill
Jim Findley, Professor Emeritus

As you may recall from last year’s newsletter, Dr. James S. Findley retired after 37 years of service to our department. He is now one of four Professor Emeriti of the Department of Biology.

Dr. Findley received a BA, cum laude, from Western Reserve University in 1950; the year before, he and Helen M. Thomson (Tommie) were married. After gaining his PhD in Zoology from the University of Kansas in 1955, he became an Assistant Professor in our department that September. He was promoted to Associate Professor in 1961, and became a full professor in 1967; he served as the department chairman from 1978 to 1982. Among Jim’s many manifest contributions to the department was the conception and building of the Division of Mammals of the Museum of Southwestern Biology, now one of the largest in the US; Jim was the Director of the Museum of Southwestern Biology from 1982 (when the position was established) until his retirement. He was also responsible for pushing for an emphasis in ecology/evolution within the department, which greatly advanced the department’s purpose and prominence. In addition, he, along with Drs. Spike Martin and Jack Longhurst, initiated the UNM Honors Program.

During the course of his career here, Dr. Findley taught Principles of Biology (freshman biology), History & Philosophy of Biology, Southwestern Natural History, General Vertebrate Zoology, Geographical Ecology, Tropical Biology, Mammalian Ecology, Mammalogy, Ornithology, Herpetology, Physiology of Exercise, Comparative Vertebrate Anatomy, and Vertebrate Embryology. He also supervised more than 30 PhD students and 20 Master’s students, many of whom are professionally employed academic biologists and active leaders in the field of mammalogy. Last year, the J.S. Findley Symposium was held at the Sevilleta Field Station; the proceedings of the symposium will be published by the MSB in the spring of 1994.

Dr. Findley’s area of specialization is in southwestern flora & fauna. Since 1973, however, he has been studying community ecology, including the community structure of coral reef fishes. He has published extensively, and books published by him include Mammals of New Mexico (1975, with A.H. Harris, D.E. Wilson & C.J. Jones), Natural History of New Mexican Mammals (1987) and Bats: A Community Perspective (1993).

Jim has been active in numerous professional societies: American Society of Mammalogists (since 1944), American Society of Naturalists, Ecological Society of American, Society for the Study of Evolution, Society of Systematic Zoologists, American Association for the Advancement of Science (Fellow), and Society of Sigma Xi.

Jim has always been active in community service: he has been a frequent speaker at the New Mexico Museum of Natural History & Science, he is a member of the New Mexico Chapter of the Nature Conservancy, and he spearheaded the preservation of the Corrales Bosque.

Dr. Findley received the 1987 Leopold Conservation Award of the Nature Conservancy “in recognition of [his] work with the mammals of New Mexico and inspiring a greater awareness of mammals and the biology of the state in general. [His] efforts in helping protect the Corrales Bosque and generating enthusiasm for areas like Mt. Taylor and the Animas Mts. are exemplary . . . [He] committed [his] personal and professional values to the long-term protection of New Mexico’s critical natural lands.” Dr. Findley also received the 1978 C. Hart Merriam Award of the American Society of Mammalogists (the Society’s highest award in this field) for outstanding contributions to mammalogy. He also has three recently discovered mammals named after him: Myotis findleyi (Tres Marias Bat), 1978; Eptesicus furinalis findleyi (Tucuman Brown Bat), 1978; and Neotoma findleyi (Dry Cave Woodrat), 1984. He

(continued on p. 9)
Findley
(continued from p. 8)
also received the UNM Regents’ Meritorious Service Medal in 1991.

When asked to give us a summary of his activities since his “retirement” in June 1992, Jim replied: “I’m currently revising Mammals of New Mexico; I’m analyzing data on reef fish biodiversity that’s been gathered worldwide with Tommie since 1981; I’m studying the impact of biodiversity on human cultural development; I’m working with Dr. Gordon L. Kirkland, Jr. (Visiting Professor of Biology and Director of the Vertebrate Museum, Shippensburg University, Shippensburg, PA) on shrew communities in the Southwest; and I’m teaching Tommie fly casting, among other montane pursuits.”

Hyperhydration Research

Stuck to Dr. Marvin L. “Bud” Riedesel’s bulletin board is a postcard of a ground squirrel. Above and reaching skyward is a photograph of NASA’s shuttle at liftoff. Thirty years of research connects those two images—fifteen PhD students, 45 Masters, and dozens of undergraduate research projects that led to entrance into medical school, graduate school or other careers. Who would have thought that studying the physiology of hibernating ground squirrels would lead to NASA-funded research on the challenges of extraterrestrial living. Who would have thought that Bud, attracted to UNM because it was the first university he had seen that specifically advertised for an environmental physiologist, would become the intellectual grandfather for much of the research in the field today, research that is funded by a wide variety of agencies: the US Armed Forces, the US Olympic Committee, the Atomic Energy Commission, and, of course, NASA’s shuttle program. All this from ground squirrels?

It’s actually quite simple. Astronauts, athletes, armies and aestivating animals all lose water at an alarming rate. Rehydrating them requires more than just water—it requires time. Long stretches of time in the case of ground squirrels, and much longer than is convenient for people who work under hot or stressful conditions. After sweating copiously, it takes nearly 18 hours for a football player or weekend gardener to recover. Dr. Riedesel and his associates, notably Adjunct Professor Dr. Roberta Bondar, who was a Canadian crew member of the Jan. 1992 space shuttle flight, have found a way to speed up the process.

When you are hot and thirsty, the cool glass of water you drink is absorbed by your bloodstream and so increases the volume of your blood. Your kidneys immediately start to reduce the blood volume because blood pressure increases filtration rate, and the low osmolality of your dilited blood simulates the kidney to increase urine flow. Dr. Riedesel’s research has discovered that if you drink glycerol (a natural breakdown product of cellular metabolism) followed by water, you can trick your kidneys and tissues into holding onto more of the water you drink. The glycerol increases blood osmolarity, passively flows into tissues, and then drags the water in behind it. The result is that athletes can load themselves up with water more rapidly and can store water in the all-fluid compartments, including intracellular spaces. This water can then be released as sweat as needed. This reduces the need to drink water during periods of high activity.

This research finding has applications for NASA astronauts. In zero gravity, fluids that normally accumulate in the legs move up in the body; this stimulates urine production to remove the excess. When astronauts return to Earth, though, they rapidly lose water from their upper bodies as it pulled, by gravity, back to their feet. This leads to a powerful thirst, at best, and in the worst cases, it leads to fainting. Bud’s work suggests that a glycerol cocktail before landing is much better than water . . . and certainly better than the balloonist’s champagne. Now if he can only figure out how to get those little bubbles in there . . .
In late 1992, an interagency team of biologists was assigned to develop a biological management plan for the riparian forest, or "bosque," of the Middle Rio Grande valley, together with the river and floodplain which it links and with which it interacts. This section of the Rio Grande Basin stretches for 160 miles between Cochiti Dam and Elephant Butte Reservoir, and contains some of the last great stands of Rio Grande cottonwood.

The need for a new, ecosystem-level approach to managing the bosque and its immediate environment stemmed from concerns expressed by many New Mexicans. Also troubled by the absence of a cohesive management policy were conservationists, resource managers and scientists. Many considered the bosque to be in serious decline, a state associated with stresses caused by decades of river regulation and other forms of environmental manipulation.

The interagency team, consisting of UNM biologist and team leader Dr. Cliff Crawford, Anne Culley of the US Fish and Wildlife Service and Mark Sifuentes of the U.S. Army Corps of Engineers (both with biology degrees from UNM), together with Rob Leuthheuser of the Bureau of Reclamation, went to work in January 1993 with these concerns in mind. They were joined by Reclamation biologists Jim Wilbur and Larry White, also authors of the final management plan.

The team’s goals were to synthesize past and present information about the ecosystem; identify key species, communities, and ecological processes essential to maintaining the ecosystem’s biological quality and integrity; recommend methods for establishing and maintaining these species, communities, and processes; recommend procedures for monitoring, conducting research, and managing the ecosystem; and identify procedures for incorporating new information and recommendations into the management plan.

In the final, thoroughly reviewed document—released in October 1993—the team attributed the decline of the bosque to the accelerating impact of a series of historical events. Prominent among these were the steady invasion, since the early 1900s, of exotic Russian olive and salt cedar trees; fragmentation of the bosque by explosive urban and suburban development; and lack of natural replacement of the aging cottonwoods. These issues had not been emphasized in past management, which instead concentrated on practical matters such as flood control, irrigation and drainage. Ironically, such practices had been largely responsible for disrupting the historic hydrological connection between the river and the floodplain, a connection that through periodic overbank flooding had made possible the establishment of new cottonwoods and willows for thousands of years.

The essence of the Middle Rio Grande Ecosystem: Bosque Biological Management Plan consists of 21 recommendations, derived from information presented throughout the plan, that, if implemented, should lead to achievement of the plan’s purpose and goals. The recommendations address hydrology, aquatic resources, terrestrial resources, monitoring and research, implementing and revising the management plan, and the need to integrate resource management activities.

Dr. Rick Coleman, Associate Director of the Fish and Wildlife Service’s regional office in Albuquerque, is now in charge of the plan’s distribution and implementation. An initial meeting to establish a representative council of managers and concerned citizens is scheduled for January 1994. Its aim will be to develop an integrated, ecosystem-level approach to management that emphasizes sustaining and enhancing the diversity and abundance of native species in particular, together with the habitats and ecological processes that support those species. Beyond that, if the goals of the plan are adhered to, management will emphasize restoring the ecosystem to where it can “return to an organizing, self-correcting state following major disturbance.”

UNM’s Department of Biology is pleased to participate in this new approach to the conservation of New Mexico’s most central resource.
Recent PhDs


LAURAINA HAWKINS, “Banner-tailed Kangaroo Rats and Cache Fungi: A Possible Vertebrate-Fungus Mutualism” (Dr. James Brown).

PAUL NICOLETO, “Male Ornamen-tation and Constitution during Mate Choice in the Guppy, Poecilia reticulata” (Dr. Astrid Kodric-Brown).

E.R. ROBINSON, “Population Biology of Cortaderia Species in the Highveld of South Africa,” University of the Witwatersrand, South Africa (Dr. Timothy Lowrey).

DERRICK W. SUGG, “Proximate Mechanisms for the Evolution of Sexual Size Dimorphism in Cophosaurus texanus” (Dr. Howard Snell).

WILLIAM C. BENNETT (MS 1970) is retired from the City of Albuquerque’s Environmental Health Department. He is a member of the US Naval Reserve, and enjoys reading, travelling and building things.

ANN J.K. BONNELL (BS 1959) is a part-time Visitor Center Supervisor at Roxborough State Park in Colorado. She is a community environmental activist, a volunteer naturalist at a number of local parks, and is involved in a number of bird population census activities.

BRENDA BLEA-EDESKUTY (BS 1987) is a graduate research assistant at the Los Alamos National Laboratory and lives in Jemez Springs.

MALCOLM Y.T. CHANG (BS 1975) is a sales representative for GE Medical Systems in Honolulu. He enjoys spending his leisure time with his wife, Vicki, and three daughters, swimming and fishing.

GLORIA E. CHAVEZ (BS 1972) is a health physicist at Sandia Labs. She is also an Adjunct Professor in UNM’s Chemical/Nuclear Engineering Department, a member of the New Mexico Radiation Technical Advisory Council, and is active in the Health Physics Society. In addition, Gloria is a volunteer at the Rio Grande Nature Center and the New Mexico Museum of Natural History & Science.

MICHAEL J. DAVIS (MS 1987) is a USFS forester currently living in Hot Springs, VA, with his wife, Becky.

CANDICE R. DEMAR (BS 1973) gained her CAP Registry in Microbiology in 1985. She is married to Dan DeMar and is currently spending her time enjoying raising their children.

RICHARD B. DOW (BS 1966, MS 1971) became a Certified Financial Planner in 1983. He is currently a Regional Insurance Coordinator for Dean Witter. He trains, educates and motivates 1,000 account executives in southern California and Hawaii to sell investment-oriented insurance products. In his leisure time, he fly fishes, skis and travels; his avocation is growing avocados in his 135-acre tree grove. Richard is married to Carol Jean Moeding (BS 1966); their son is a joy to watch playing basketball as a center.

JENNIE O. DUFFY (BS 1971) received an MS in Microbiology and Epidemiology from Harvard University and her MD from the Baylor College of Medicine. She is currently a physician practicing dermatology. Jennie and her husband, Robert, live in Houston.

FREDERIC A. GIERE (PhD 1953) retired in 1988 from Lake Forest College after 26 years as Professor and Chairman of Biology. At that time, he accepted an appointment as Adjunct Professor at the Northwestern University Medical School in Chicago. Two years ago, he resigned as Chairman of the Research Committee of the Illinois Division of the American Cancer Society; this division is one of eight that sponsors a local research program. Currently, Frederic stays busy working at the medical school, consulting, and

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fabricating specialized research equipment. His donation to the BSNM was in honor and memory of his mentor, Dr. Wilburn J. Eversole, UMM Professor of Biology in Physiology.

CHERYL F. GRAHAM (BS 1968, MS 1970, MD 1978) is a Clinical Research and Product Development Advisor for the Biometric Research Institute in Arlington, VA.

ROBERT W. HAIGHT (BS 1990) is a second-year medical student at the University of Washington. He enjoys movies, reading biographies, hiking, and the ocean.

HEIDI J. HAMLIN (BS 1982) received a DVM from Colorado State University in 1987 and an MS from the University of Saskatchewan in 1990. After completing her internship at Cornell University and a residency at the University of Saskatchewan, she was appointed in 1991 the Acting Clinical Director at Stanford University’s School of Medicine in the Department of Comparative Medicine. Heidi has a veterinary practice and resides in Mountain View, CA, with her 4-year-old son, Isaac.

VIGIL K. HOWE (MS 1961) and his wife, Virginia, live in Hays, KS, where he is a college dean.

GEORGE F. HOWLLETT, JR. (MAT Sci 1967) received an MS degree in Forest Ecology and Limnology from SUNY’s College ESF program at Syracuse University. He is a hydrologist, and provides a forest ecology consulting service.

ROSANNE L. HUMPHREY (BS 1989) is a graduate student at Oklahoma University in Norman. She enjoys reading, hiking and camping.

KERRY S. KILBURN (MS 1984, PhD 1988) is an Assistant Professor of Biology at the West Virginia State College. As the resident zoologist, she teaches introductory biology, general zoology, comparative vertebrate morphology, vertebrate zoology, embryology and animal development, and evolutionary biology. Kerry recently co-wrote “Process-Oriented Laboratory Exercises for Biology” as an ancillary to Levine’s and Miller’s Discovering Life, a top introductory biology textbook.

JAMES E. KING (MS 1964) is the Director of the Carnegie Museum of Natural History in Pittsburgh, PA.

RAYMOND C. KREHOF (MS 1971, PhD 1975) is the Corporate Director for Environmental Compliance at DynCorp of Albuquerque. His leisure time is spent playing golf.

JAMES D. LILICH (BS 1985) received his DVM from Colorado State University in 1991 (Summa Cum Laude). From 1991-92, he worked at Cornell University as a Large Animal Surgery Intern. At present, he is a Equine Surgery Resident at the Ohio State University. He is also working on a graduate degree with the area of study in cartilage matrix and metabolism.

ANA B. LOPEZ-VERA (BS 1979, MD 1984) is in family practice with the University of California Faculty Physician’s Group. She enjoys gardening, traveling, various crafts, reading and hiking.

SUSAN R. LUCK (BS 1963) is a pediatric surgeon and an Associate Professor of Clinical Surgery at Northwestern University Medical School.

HAROLD A. MACKAY (MS 1966, PhD 1970) is retired and living in Wyoming, but is available as a consultant. He volunteers his time to the Teton Science School, where he catalogues the Olas Murie botanical collections from Alaska. He is an activist for environmental causes, and a black-belt karate instructor; he also enjoys doing wildlife photography.

LYNN MARPL (MS 1975, PhD 1979) is an environmental engineer, and is currently working as a subcontractor for the Department of Energy for the Superconducting Super Collider project. She ensures environmental compliance on such issues as wetland mitigation and restoration of native prairie.

JAMES L. ROBINSON (BS 1957, MS 1969) is in his 24th year as a professor of Science at Aims Community College in Greeley, CO; he is also the Chair of the Science Department. James and his wife, Phyllis, have two sons, one daughter and a grandson. His leisure activities include sightseeing, hiking and photography.

BRUCE A. SHAFFER (BS 1980, M.D. 1985) is a physician in Santa Fe, and specializes in internal medicine, pulmonary diseases, and critical care. He enjoys travelling, skiing and sailing.

ROBERT D. SPENSLY (BS 1941, MS 1946) is a retired physician and lives in Albuquerque with his wife, Nita.

CYDNEY C. STEWART (BS 1977, MS 1981, M.D. 1985) is a cardiologist in Canoga Park, CA, and is married to David A. Hovda.

ALISABETH THURSTON (BS 1982) obtained her MD degree in 1992, and is currently a resident physician in psychiatry. Her leisure
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**Time activities** include cycling, skiing, running, backpacking and spending time with her fiancé, Paul.

**Sue Tornquist** (BS 1980, MS 1987) is a DMV and a clinical pathologist at Washington State University, where she is also working toward a PhD in veterinary virology/hematology. She enjoys sea kayaking, hiking and skiing.

**Robert B. Troxel** (MS 1940) enjoys gardening and photography in his retirement.

**Elizabeth A. Vencill** (BA 1971) is a medical technologist, and is currently working as a clinical laboratory technologist for Smith-Kline Beecham. For 1991-93, she is the State Advisor of California to the Associate Member section of the American Society of Clinical Pathologists.

**Daniel F. Williams** (MS 1968, PhD 1971) is a Professor of Zoology at California State University in Stanislaus, and the Director of USFSW's San Joaquin Valley Endangered Species Recovery Planning Program.

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*December 1993*
The Biological Society of New Mexico is a tax-exempt organization under the New Mexico Non-profit Corporation Act and the United States Internal Revenue Code. The object of the Society is to establish and maintain endowments, trusts, foundations, and other funds, all for the purposes of encouraging, fostering, and pursuing excellence in education in the Department of Biology at the University of New Mexico.

Tax-exempt gifts may be given with designation to be used for specific purposes, such as those identified below, as long as the purpose fits the objectives of pursuing excellence in biological education and research at UNM.

Donations and annual membership fees, unless otherwise specified, are placed in our Unrestricted Gift Account. These funds are used primarily to support both undergraduate and graduate student recruitment, research, travel to meetings to present papers, spring graduation, and awards for teaching excellence. In addition, we have six other accounts that may have special interest to you.

L.D. Potter Endowed Chair in Plant Ecology

This chair, named in the honor of Loren D. Potter, who retired in 1985, recognizes and highlights the importance of plant ecological studies as they pertain to our natural resources. As of June 30, 1993, the L.D. Potter fund had $159,708. The current holder of the Potter Chair is Dr. Diane Marshall.

Melinda Bealmear Scholarship

Melinda Bealmear was a dedicated and beloved staff member in our main office, who died in a tragic car accident in October 1986. Our graduate students, faculty and staff, along with help from her parents Dorothy and Dale, established a scholarship fund in her memory. The fund now has about $3,700. We would like to accrue enough principal, say $50,000, so that the annual interest could be used to support the program of a needy graduate student in Biology.

Museum of Southwestern Biology—Mammals

The purpose of this account is to support all aspects of mammalogical research conducted by faculty and graduate students in Biology at UNM. This fund was developed by Drs. Findley and Yates to supplement state-appropriations and enhance research and teaching in mammalogy programs.

Museum of Southwestern Biology—Ornithology

Recently established by Dr. Robert Dickerman, the purpose of this account is to support all aspects of ornithological research by UNM Biology faculty and graduate students.

Presidential Young Investigator Matching Funds

In the next two years, we will be working against time to help our three PYIs (Drs. D. Marshall, B. Milne and M. Werner-Washburne) generate the private funds they need to qualify for matching funds from NSF. Remember that donations can be in kind (i.e., building materials, vehicles, laboratory equipment, etc.). Won't someone try to sponsor a PYI? Each dollar you give generates a dollar from NSF.

Faculty Excellence Fund

We started this fund to support faculty travel to professional meetings where they present the results of their work. We have only $7,290 in this fund—obviously a long way from a meaningful endowment.

Membership

Any person contributing $20 or more annually becomes a member of the Society and will receive the annual BSNM newsletter.

All memberships and contributions are tax exempt.
Please respond even if you can't contribute. If you haven't responded before, we'd really like to hear from you and learn about what you're doing. If you can help us financially, or with donations in kind, please let us know how you want your contribution used:

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