Volume 4, Issue 1

November 2003



Forest Seasons

To Alumni and Friends of School of Forestry

In August 1999 I left NAU and the Dean's position in the College of Ecosystem Science and Management to be Director of the Center for Wildlife Management Studies in Kenya. This was my second journey to work and live in Africa among a mixture of cultures, large landscape problems, a complexity of habitats and wildlife, and native people who seem to enjoy life even when conditions border on having only the bare necessities. After Africa I worked in Australia as Director of the Center for Rainforest Studies where living and working conditions were just the opposite of Kenya. My assignment in Australia ended in March 2003 and I returned to Tempe, Arizona where I became involved in laying the groundwork to establish a School for Field Studies on the Hualapai Reservation in Northern Arizona.

In May, I received a telephone call from the Provost at NAU asking if I would consider coming back for a year as Interim Dean of the School of Forestry because the College of Ecosystem Science and Management was being dissolved and the School of Forestry would again become a stand-alone academic unit on July 1, 2003. With approval of the faculty, I accepted the assignment at the beginning of the current fiscal year.

The reasons for dissolution of the College are several, but basically, they resulted from a lack of compatibility of academic programs and differences in research interests of the individual college units. The School of Forestry was an accredited, nationally recognized academic, research and service unit before the college was established and will continue to have this distinction as a stand-alone academic unit with a Dean that reports to the Provost. The School of Forestry is administratively supported by a Dean; Associate Dean, Laura DeWald; Business Manager, Christina Brown; Administrative Assistant, Rachel Crawford; Office Assistant, Inez Light; and Student Coordinator and Recruiter, Katie Leao.

For several years NAU, along with many other colleges and Universities across the country, has experienced budget cuts and decreases in student enrollment. For Fall 2003 the decrease in enrollment at NAU was over 1,000 students, triggering a major effort to review budgets and look for ways to reduce costs along with canceling all requests to recruit for vacant positions including the Dean's search for SoF. This action resulted in a second request by the Provost for me to stay longer than a year and again, with approval of the faculty, I agreed.

The Board of Regents has indicated that Arizona Universities are no longer state funded but state assisted. What this means to SoF is that contracts, grants, and alumni donations are becoming more important to sustaining our productivity in a team-taught, multidisciplinary academic program. The faculty in the School of Forestry have always responded to change when requested to do so by the administration or, in most cases have volunteered because of changes in our profession.

Our response to declining enrollment and budgets is to initiate an intensive recruiting effort in California and New Mexico, look for ways to finance the Centennial Forest outside our regular budget, increase our cooperative efforts with the Ecological Restoration Institute to support undergraduate and graduate assistantships, put more undergraduate courses on the web, and recruit students for our new non-thesis Master's Program. In addition we will work with Virginia Tech in a new consortium to train Forest Service employees through distance learning, look for ways to be more efficient in delivering our program, and anticipate continued support from our generous alumni and friends of SoF. None of these individual efforts will solve the enrollment and budget problems facing NAU or the School of Forestry, but collectively they will contribute to being an accredited Forestry School and a productive academic unit whose students can compete successfully in the job market.

I am asking you, as alumni and supporters of the School of Forestry, for your help in identifying foundations and companies for me to contact that might be interested in financially supporting any of the areas I have identified such as the Centennial Forest. Our old alumni database has now been upgraded with new software maintained by the NAU alumni office, therefore keeping in contact with former students will be easier than in the past. Let us hear from you with information on yourself to be included in the Spring Forest Seasons and let us know if you need recruiting material to give to friends, relatives, or coworkers. You can send comments and questions to our email address at:

forestry.alumni.info@nau.edu

One of my favorite sayings from Kenya is "safiri salami" which means: "have a safe journey."

-David R. Patton, Dean

Logging Sports poised for Forestry Club Return

After nearly a thirty-year absence from the School of Forestry, logging sports is back. Or, at least, that is the proposal currently being authored by the NAU Forestry Club and its faculty advisors in the School of Forestry. Under the proposal to be submitted to NAU administrators this fall, logging sports would be reinstated as a university-sanctioned, Forestry Club activity that involves intercollegiate competition as a member of the Association of Western Forestry Clubs. As most accredited forestry programs in the western United States have logger sports teams, the NAU School of Forestry team will be competing with the likes of UC Berkeley, U Montana, U Idaho, U Washington, U Nevada-Reno, U Alberta, Oregon State, Humbolt State, Washington State, Utah State, Colorado

State, and Cal Poly State, if the proposal is successful. A renewed interest in traditional Forestry Club activities, along with enhanced flexibility in scheduling forestry course work, has once again made logger sports a vital outlet for student competition, learning, and community service. And as for the team name? — well that's the easy part. How does the 'Lumberjacks' sound to you?

If you have ideas or suggestions for the Forestry Club Logger Sports Team, or you have personal recollection of past logger sports activities and personalities at the School of Forestry, please contact Denver Hospodarsky, PO Box 15018, Flagstaff, AZ 86011; 928-523-7525; Denver.Hospodarsky@nau.edu



Native Science is for Real!

The American Association for the Advancement of Science (AAAS) extended a special invitation to Thomas Alcoze and 19 other recognized Native American Scientists in the United States to participate in two half-day symposia concerning Native Science and to inaugurate a new network for women and minor-

ity scientists at the AAAS annual meeting, held February 13-18, 2003 in Denver, Colorado.

Thomas Alcoze currently provides a leadership role in the development and implementation of a Native Science Symposia for the 2004 AAAS annual meeting in Seattle Washington; February 12-17, 2004; "Science at the Leading Edge". He will present a paper focusing on how women and minority students are marginalized within mainstream science and natural resources professional programs in the U. S.

Forestry Faculty Visiting BLM in Washington, D.C.

Yeon-Su Kim had a chance to visit the Bureau of Land Management's Washington office, and work as a volunteer from June 26 to July 11, 2003. This volunteer arrangement is part of the BLM's minority recruitment efforts and made possible by the interests and supports of BLM staff and managers from the Denver and Washington offices.

Kim said, "I learned day-to-day BLM business operations to return to my classroom so the students are more educated on the BLM's mission, and I also promoted Northern Arizona University and our forestry program to the BLM managers."

Page 2 FOREST SEASONS

Xi Sigma Pi Update

Dr. Larson has been actively involved with Xi Sigma Pi service projects which have included: refinishing the old picnic tables, landscaping the stone monument, and building the trail in front of the forestry building. In addition, he is currently working on a focus area for wood products for those students who desire to go in the private sector of the wood industry.







Wildlife News from Dr. Paul Beier

In Spring 2003, Paul Beier started serving on the Recovery Team for the ocelot, which is listed as endangered under the Endangered Species Act. In Fall 2003, he completed a major review of scientific research on the endangered Florida panther. He is starting the second year of his 3-year term on the Board of Governors of the Society for Conservation Biology, the leading international organization in this field. He is continuing to work with West

African conservationists to create and sustain a sanctuary for hippopotamus in northwest Ghana (West Africa). In summer 2003, he visited northeastern Ghana to consider a project to conserve an elephant herd that migrates between Ghana, Burkina Faso, and Togo. He continues to work on a large-scale conservation planning effort in southern California.



VOLUME 4, ISSUE 1 Page 3

The Southwest Forest Science Complex has grown another classroom.

Four vinyl-coated steel tables were purchased from Arizona's Department of Corrections this summer by Dean Robert Clark and Dean Dave Patton. The tables were installed by Xi Sigma Pi members Jeremy Derickson, Kristina Rask, and Scott Sink with the enthusiastic assistance of Dr. Robert Larson. Forestry faculty and students are already enjoying the outdoor classroom, located at the lower level south entrance of the building.

What is Xi Sigma Pi?

NAU's Forestry honors society, a.k.a. Xi Sigma Pi, Alpha Pi chapter, is a service organization comprised of our top students. Recent service projects include a stepped trail (featuring the chainsaw work of Dr. John Bailey), resurfacing older picnic tables (with the help of truck 333), and installing the outdoor class-

room (all thanks to Bob's level). The next proposed project is cleanup of Sinclair Wash.



From L to R: Scott Sink, Dr. John Bailey, Dean Dave Patton, Jeremy Derickson, Kristina Rask, Kenneth Baumgartner, Nathan Lojewski, and Jane Dobbie



Effects of the Rodeo-Chediski Fire

In 2003, Pete Fulé started research on the effects of the Rodeo-Chediski fire in cooperation with Carolyn Sieg and Linda Wadleigh of the Forest Service. The fire was the largest in Arizona history and burned with high severity over several watersheds (see attached picture). Graduate students Amanda Kuenzi and Barb Strom will be measuring the post-fire environment and modeling how the degree of severity of fire affects future ecosystem development over the next century.

Faculty Awards

Dr. John Bailey was named "Teacher of the Year" for the College of Ecosystem Science and Management and competed successfully for a Forest Service research position in Olympia, WA that will fund his sabbatical during 2004.



Dr. Aregai Tecle was selected as the Northern Arizona University Faculty Advisory of the year for the School year 2002-2003.

Page 4 FOREST SEASONS

Graduate Program News

In addition to teaching FOR212 (Trees and Forests of North America), portions of forest ecology in FOR313/314 ("Semester A"), and FOR550 (Forest tree ecophysiology), much of Tom Kolb's energy is devoted to coordination of the graduate program in the School of Forestry and research. New research projects by Tom and his graduate students and collaborators include:

- Insects as ecological indicators for southwestern ponderosa pine forests: NAU School of Forestry faculty Wagner, Bailey, Hart, and Kolb have been funded recently by the USDA National Research Initiative Competitive Grants Program to study how thinning and prescribed burning affects a range of ecosystem characteristics in southwestern ponderosa pine forests. M.S. student Greg Zausen is working with the group to better understand how forest management affects tree water stress and resistance to bark beetle attack.
- Host ecophysiological controls on dwarf mistletoes: M.S. student Chris Bickford is studying the influence of light and water stress on performance of dwarf mistletoes (Arceuthobium spp.) that parasitize ponderosa pine, lodgepole pine, Douglas-fir, and western hemlock in greenhouse and field experiments. Brian Geils (USDA Rocky Mountain Research Station) collaborates on this research (funded by the NAU School of Forestry Mission Research and McIntire Stennis Programs, and the USDA Rocky Mountain Research Station).
- Seasonal dynamics in bark beetle flights and ponderosa pine growth and physiology: M.S. student Monica Gaylord is testing the hypothesis that flights of some bark beetle species occur when tree resin defenses are high as a result of the unusual seasonal pattern of tree growth and water stress in northern Arizona. This hypothesis may help explain the lack of historic bark beetle outbreaks in northern Arizona in a landscape of
- trees highly stressed by drought and competition. Mike Wagner (NAU School of Forestry), Eric Smith, and Drew McMahan (USDA Forest Service Forest Health Technology Enterprise Team) collaborate on this research (funded by the NAU School of Forestry Mission Research and McIntire Stennis Programs, and the USDA Forest Health Technology Enterprise Team).
- Effects of fire and competition from native plants on knapweed invasion in southwestern ponderosa pine forests:

 M.S. student Barbara Satink-Wolfson is studying how fire disturbance and competition from native plants affects establishment of an exotic, noxious weed, diffuse knapweed (Centaurea diffusa), in ponderosa pine forests of northern Arizona. Karen Clancy and Carolyn Sieg (USDA Forest Service Rocky Mountain Research Station) collaborate on this research (funded by USDA Rocky Mountain Research Station).

Grant Awarded to Study Historical Permanent Plots

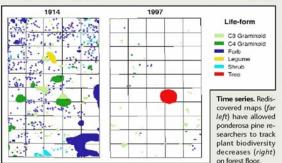
The School of Forestry and Ecological Restoration Institute have re-located some historical plots that were established in Arizona and New Mexico between 1909-1915. Both the overstory trees and some of the understory herbaceous vegetation were mapped, so we are remeasuring and remapping the plots. The understory plots caught the attention of Science magazine writer - David Malakoff and he wrote a little inset piece about them last fall (see the following article). In addition, last December 2002 we landed a major USDA-NRI competitive grant for 4-years to study these plots. M. Moore, P. Fulé, P. Parysow and D. Huffman were all authors of this grant. Graduate students Andrew Meador, David Bell, Jonathan Bakker and numerous undergraduate students also participate and do the remeasuring and remapping of the plots. The following is an excerpt from the USDA-NRI grant. "A set of historical permanent plots, established and mapped in the ponderosa pine and mixed conifer for-

est types of Arizona and New Mexico between 1909-1915 and re-measured every 5 years until the 1950s, provides a unique opportunity to detect and quantify forest change throughout the Southwest. We propose to re-measure a subset of these plots, perform simulation modeling, and generate and test hypotheses about disturbance factors and their effect on forest structure, composition and function over time and into the future."

Out of the Vault, Into the Forest

FLACSTAFF, ARIZONA—Seven years ago, a local historian tipped off forest ecologist Margaret Moore of Northern Arizona University to a cache of dusty maps. They rested in a neglected vault here at the U.S. Forest Service's Fort Valley Experimental Station, set up in 1909 as the government's first research forest. Moore took a peek and marveled at the ecological time capsule that lay before her. In spare black-and-white were drawn the locations of hundreds of saplings, trees, and downed logs in a 160-square-meter patch of forest almost a century ago. The vault contained dozens of such labor-intensive portraits, from 1- to 7-hectare plots spread across the southwestern United States.

The maps were a potential cornucopia of data for Moore and her husband, Wally Covington, who have spent much of the last decade



trying to understand the recent evolution of the southwestern ponderosa pine forests (see main text). "That kind of detailed information is incredibly rare," she says. The drawings cried out for a follow-up study to see how the plots had changed.

The collection wasn't perfect, to be sure. Data ledgers were missing, and the cross-hatched rectangles that appeared randomly on some maps were a mystery. Moore didn't even know if the plots, some staked out as long as 94 years ago, could still be found.

some staked out as long as 94 years ago, could still be found.

Undaunted, Moore and the historian—Susan Olberding—searched for one plot that appeared to be just steps from the vault. "I bet it didn't take us 10 minutes to locate it," recalls Moore. The treasure trove grew as Moore and her colleagues hunted down original corner stakes and even metal tree-marking tags, rusted but still readable. Then the ledgers turned up, providing meaning to the mysterious rectangles.

They were 4.5-square-meter microplots that had also been carefully surveyed—down to grass stem and twig locations. Beginning in 1909, Forest Service scientists G. A. Pearson and T. S. Woolsey had established the more than 100 plots of various sizes as part of long-term monitoring studies. Some had been revisited periodically up to the 1950s.

Discovering the microplots was enough for Moore to get started. She and her colleagues have already looked at eight of the microplots near Flagstaff, and they have found that the thickening ponderosa forests appear to have reduced the number and kinds of plants on the forest floor. A \$310,000, 4-year grant from the U.S. Department of Agriculture will now allow them to remap about 40 of the bigger plots in New Mexico and Arizona. Moore expects to document measurable changes and build computer simulations to depict the past, present, and future of the forests. "It would be great," she says, "if researchers 100 years from now could revisit these plots, too." —D.M.

VOLUME 4, ISSUE 1 Page 5

ERI and Centennial Forest Unite for Forest Health

As smoke and debris particles from enormous southern Californian wildfires ominously filter the sunlight in Flagstaff's sky, researchers from Northern Arizona University's Ecological Restoration Institute (ERI) and the Centennial Forest are working together to learn more about how ponderosa pine forests sustained themselves before Euro-American settlement.

Scott Abella, a School of Forestry doctoral candidate with an emphasis in restoration ecology, is examining the impacts of thinning and prescribed burning treatments on a landscape level. His research targets understory plants and how they respond to restoration projects on different soil types in the ponderosa pine forest.

"Scott is looking at why a certain species such as rabbit brush might grow in one part of the forest and not in another," says Forester Cheryl Miller. "He's also looking at the impacts on vegetation from grazing, stand density and historical factors such as seed bank composition."

Meanwhile, Megan Van Horne, an ERI graduate research student working on her master's degree in forestry, is examining fire scars from some 1,500 cross sections of ponderosa pines—cross sections that she cut from old stumps and trees with help from her ERI coworkers. Van Horne's research covers some 250 acres in the Centennial Forest and is the most comprehensive study on historic fire frequency to date.

"The real contribution of this research is that this is by far the most detailed look at the way we collect samples and what it means in fire history," said Pete Fulé, ERI associate director of ecological research. "In the past we have only collected data from trees that have numerous fire scars, but Megan is sampling every single scarred tree."

John Bailey, Centennial Forest interim director and associate professor of silviculture, is studying how trees grow after a multi-age group selection treatment. His goal is to identify how to restore and perpetuate stand structure over time. "I'm interested in promoting more of the young tree component of the ponderosa pine ecosystem. Vigorous seedlings and saplings are rarer than the yellow pines and in that rareness lies the future of the forest."

Bailey's 200-acre project is partially funded with \$250,000 from the ERI. Recently he has been speaking to land managers at Ecological Restoration Principles Workshops about the importance and urgent need for restoration treatments that focus on multi-age structure and spatial arrangement of ponderosa pine trees.

By Bonnie Stevens, ERI Media Coordinator



Page 6 FOREST SEASONS

Generous Gifts of Alumni, Faculty and Friends!

Thanks to the generous gifts of alumni, faculty and friends of the School of Forestry, twenty-four students were awarded \$22,500 in scholarships at the annual Honors Convocation held on April 25, 2003. Awards were targeted at deserving students demonstrating academic excellence and leadership. Highlights of the evening included personal testimonies from alumni and faculty who had initiated scholarships in memory of loved ones. Our thanks to all scholarship contributors and our congratulations to all award recipients.

Name of Scholarship	Amount	Recipient
Arizona Water Resources Committee Forestry Scholarship	\$330	Darin Schmuki
Dave Schmidt Forestry Scholarship	\$500	Nathan Lojewski
Dick W. Berry Forestry Scholarship	\$360	Kristina Rask
du Bois Foundation Scholarship	\$2,000	Caley Boone
Forestry Alumni Scholarship	\$1,000	Jeremy Derickson
Forestry General Scholarship	\$500	Micah Evans
Forestry General Scholarship	\$300	Mark Brehl
Glen Voorhies	\$1,000	John Odell
Greenlaw Forestry Scholarship	\$500	Dale Rogers
Greenlaw Forestry Scholarship	\$500	Darin Schmuki
Harold Shulman Scholarship	\$800	Aleta Zufelt
Helen Wright Memorial Scholarship	\$600	Kaikea Kaoni
John H. Stephenson Forestry Scholarship	\$395	Heather McRae
Josephine Soulen Forestry Scholarship	\$1,200	Robert Ivens
K.R. & Irene Hafen Forestry Scholarship	\$1,800	Kenneth Baumgartner
K.R. & Irene Hafen Forestry Scholarship	\$1,800	Jane Dobbie
Laurel and Dorothy Brenn Forestry Scholarship	\$800	John Odell
Levon P. Dunford Forestry Scholarship	\$380	Scott Sink
Louise Utley Scholarship	\$500	Scott Sink
Machina-Roccaforte Wedding Scholarship	\$200	Kristina Rask
Martin Applequist Scholarship	\$1,800	Jane Dobbie
Neil A. Barrick Forestry Scholarship	\$500	Andrew Leinendecker
Paciorek Family Scholarship	\$1,200	Kevin Johnson
Ramon Aso Forestry Scholarship	\$285	Dale Rogers
Robert A. Blaser Forestry Scholarship	\$625	Evan Hjerpe
Tommy Knowles Jr. Forestry Scholarship	\$260	Elijah Chamberlain
Tony Czak Forestry Scholarship	\$360	Maurice Foye
Vicki and Dwight Scarbrough Forestry Scholarship	\$300	Andrew Leinendecker
Wildlife Habitat Relationships Scholarship	\$200	Matt Leise
William L. Holmes Memorial Forestry Scholarship	\$340	Brian Lake
Williams Family Forestry Scholarship	\$250	John Manthei

VOLUME 4, ISSUE 1

A Thank You Letter

Northern Arizona University's School of Forestry Alumni Association Flagstaff, AZ 86011-5018

May 9, 2003

Dear Forestry Alumni:

I am deeply honored to accept the Forestry Alumni Scholarship. This gift will help me spend more time studying and researching during my Capstone year, something that this year's graduating class says I will need dearly.

It is especially wonderful to receive this award from the donations of many pockets rather than a single donor foundation, because it represents the hopes of the whole alumni organization, whose members are the most qualified judges of a forestry student's performance. My leadership in our forestry class of 2004 is academic and extracurricular, and I hope to create friendships that will carry many of us throughout our careers. As president of Xi Sigma Pi, I will be leading the elite foresters through the next year, but surely I will also lead the whole class.

Thank you again for this generous award. In one year, I will make my first contribution to the pot for the next generation of scholars.

Sincerely,

Useremy Gregg Derickson

was 6 Juste

Welcome, From the New Associate Dean!

I was honored when our new Dean, David Patton, asked me to serve as Associate Dean. The areas of responsibility for the Associate Dean were among those that I have special interests in, including the curriculum, strategic planning, and our Mission Research program. I am excited about the opportunity to have a role in the oversight of these key areas, which are fundamental to the ongoing success and national reputation of the SoF. I look forward to contributing to moving the SoF forward as we work hard on recruitment and retention of forestry students, and on the development of external resources that will enable us to deliver high quality education to our students, and that will support our Centennial Forest and research programs. I was delighted to spend time with six alumni who visited our SoF booth and alumni reception at the recent SAF convention in Buffalo, NY, and I hope that our alumni will continue to keep us informed about what you are doing these days, and please stop by to see us whenever you are in the Flagstaff area! - Dr. Laura DeWald

Page 8 FOREST SEASONS



NORTHERN ARIZONA UNIVERSITY

The Centennial Forest Update

August 2003

From the Director

It appears that "the monsoons" are truly here and that we will survive another year without a major fire on the Centennial Forest; we get another year for constructing fuel breaks through these strategically located lands southwest of Flagstaff. Combining several grants made to Northern Arizona University and the State Land Department and some shared resources, we have been marking and treating hundreds of acres this summer the most current being in the Fisher Tank area of the Historic School Forest. This new harvest unit is a dramatic contrast to business as usual; it is a comprehensive treatment that provides significant improvement in fire behavior for at least 30 years, creates structural diversity for wildlife and aesthetics, and provides a sustainable arrangement of tree ages for future generations to enjoy. Besides these fundamental ecosystem services, we now have a demonstration area for years of education, outreach, and its related research projects. This, in a nutshell, is the mission of the Centennial Forest, and we will continue to provide such a range of land management treatments for the benefit of the State. — John Bailey, Acting Director (while Dr. Mike Wagner is away)

SFA Grant Funded

Recently, the Centennial Forest recived a State Fire Assistance Grant for \$196,000. The objective of the proposed project is to reduce current stand density using mechanical thinning. Thinning will follow uneven-aged, group selection prescriptions developed in conjunction with Arizona State Land Department staff. The project area is 4,000 acres of the Centennial Forest and is generally referred to as the Historic School Forest (HSF). The Historic School Forest lies within the Flagstaff Wildland-urban interface and has been categorized by the Flagstaff Fire Risk Assessment as having a high potential for catastrophic fire, because it is southwest and upwind of Flagstaff.

Centennial Forest Tours—a Huge Hit at Flagstaff Forest Festival

The 2003 Flagstaff Forest Festival kicked-off at Wheeler park on Saturday, April 26th. This year's Festival was held in conjunction with the City of Flagstaff's Earth Day and Arbor Day celebrations. Throughout the day, the public gathered at Wheeler Park and the Orpheum Theater to learn about the forest surrounding Flagstaff. The NAU Centennial Forest conducted community tours of forest management activities, research projects and historical sites. Highlights of the tours included oldgrowth ponderosa pine pockets, Wildland-urban interface areas, and bark beetle research sites.

The tours were well attended with nearly 60 members of the community joining us. Topics that received the most attention were fire, forest thinning, drought and of course, bark beetles. The tour guides, Kofi



Cobbinah, Cami Fuller, Naomi Marcus, and Stephanie Smith, shared their forestry knowledge with the public while Cheryl Miller manned a booth in Wheeler Park to answer questions about the Centennial Forest.

Fisher-Rock Restoration

As mentioned our April Issue, four hundred acres of forest restoration research treatments were slated to begin. Since then, work has started with Phoenix-based Southwest Forest Products, Inc. In addition to the thinning small diameter trees, roads are being improved to reduce erosion and other damage to natural resources. The treatments are part of the School of Forestry's Stand Treatment Impacts on Forest Health study and the Ecological Restoration Institute's Mogollon Rim study. For more information on the Fisher-Rock Project contact Cheryl.Miller@nau.edu.

New Research Projects on the Centennial Forest

This summer we began three new projects on the Centennial Forest although not new faces. Scott Abella and Wally Covington are looking at how the vegetation responds to thinning and prescribed burning among five ecosystem types in the Ponderosa pine forest.

Tad Teimer and Lee Ann Compton, from NAU's biology department, are examining natural and managed fire and rodent seed-caching behavior. Their findings will help resources managers make decisions about restoring understory plants after burning.

Tom DeGomez, a forest health specialist from University of Arizona stationed at NAU, will be determining the overall efficiency of five insecticides—Sevin, Biflex, Permethrin, Orthene, and Dinotefuran. The study will help urban foresters decide which, if any, chemicals should be used on high value trees that are being threatened by bark beetles.

VOLUME 4, ISSUE 1



SCHOOL OF FORESTRY

Southwest Forest Science Complex PO Box 15018 Flagstaff, AZ 86011 1FOR1119

Forestry Faculty and Staff—August 19,2003

