

FOCUS

on Renewable Natural Resources

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College of Forestry,

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From the Associate Director



Leon F. Neuenschwander

Continuing Education: Scientists, Practitioners, Students, and Public

The 6th guiding principle of our college strategic plan—Quest for Excellence (Q4E) is to expand continuing education and outreach, partly by strengthening the college's "real world connections" through addressing the needs of the private sector, making use of practicing professionals, and increasing the real world experience of students.

This year's *Focus* showcases 18 of the approximately 84 continuing education and outreach programs the college offered during 1990, courses that reached about 2500 public land managers, technicians, scientists, teachers, schoolchildren, ranchers, activists, and members of the general public. Participants learned in conferences, workshops, shortcourses, and various other forms of contact with faculty from all five departments of the College of Forestry, Wildlife and Range Sciences: Fish and Wildlife Resources, Forest Products, Forest Resources, Range Resources, and Resource Recreation and Tourism (formerly Wildland Recreation Management).

Although *Focus* is the annual report of the Idaho Forest, Wildlife and Range Experiment Station—the research arm of the college, we have chosen this year to highlight the numerous ways that research information is disseminated. This transfer works like a pipeline of information from professional to professional, from the faculty to the public, and from researcher to practitioner—thus helping the state's citizens understand the nature and function of their natural resources, and the resource managers and decision-makers to better serve their constituents.

Helping to meet the needs of the private sector, Range Extension Specialist Ken Sanders conducts Coordinated Resource Management (CRM) workshops throughout the state. His course's "role reversal" game requires ranchers, conservation biologists, and agency personnel to trade places and work together to develop a coordinated management plan for a given area.

Making use of practicing professionals is a given when they make up some of the cadre of course instructors, many of the participants, and several of the sponsors. Sanders' CRM workshops, for example, attracted the talents of former BLM Deputy State Director Joe Zimmer as an instructor in 1990. At least half of the activities summarized in this issue utilize the expertise of professionals already in the field.

Increasing the real world experience of students are The Mill Studies, wherein students check the efficiency of local sawmills and mill owners contribute by providing their mills as hands-on classrooms; and PhD student Danny Markus tells what it is like to be the first student manager of the local Latah County Parks and Recreation Department.

The Q4E calls for the continued training of mid-career resource professionals. The Executive Leadership of Political and Social Forces in Natural Resources shortcourse improves resource managers' skills for developing community-accepted decisions, even taking them to visit the teachers, policemen, nurses, and others in Idaho's small towns who are affected by natural resource decisions. Also receiving mid-career training are the foresters who visit Moscow every summer for the UI/Honduras Forestry Field Training Course, and in 1990—the Bolivian Forestry Training Program also. The Bolivian course hosted several chiefs of the Bolivian government as participants, for example the chief of the Department of Wildlife Protection. The Training Program for Southeast Asia Wildlife Preserve Managers was attended by the director of the Forest Research Conservation Project in Laos, among others. And the increasingly popular industry-funded Wood Products Academies draw growing numbers of plant managers, shift supervisors, material purchasers, bankers, accountants, and others to improve their knowledge of a changing and vital industry for Idaho.

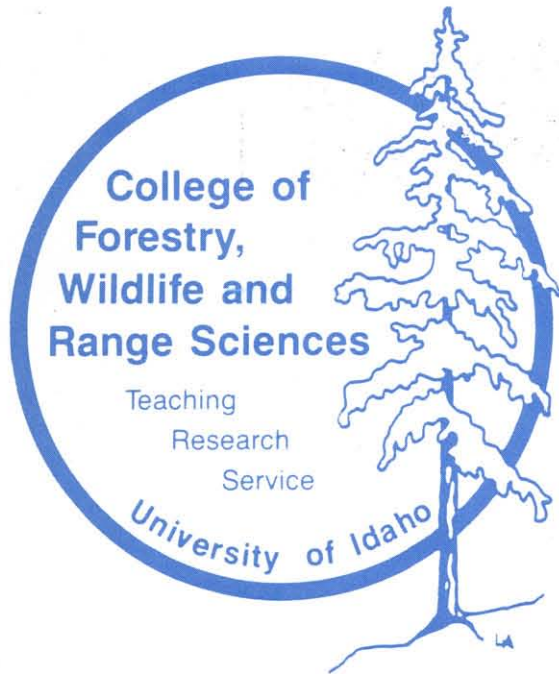
To enhance public involvement, the Policy Analysis Group continues to generate the reports that provide Idaho citizens and decision-makers with impartial information on important and controversial natural resource issues in the state. For a complete list of course offerings including exceptional ones not highlighted in this issue, see the Continuing Education and Outreach section in the Appendix.

I hope you enjoy this issue of *Focus*.

A handwritten signature in dark ink that reads "Leon F. Neuenschwander". The signature is written in a cursive, flowing style.

University of Idaho

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The college's 1990 continuing education, outreach, and service activities reached nearly 2500 ranchers, public land managers, teachers, activists, technicians, college students, members of the general public, scientists, even school children—within Idaho and around the world. File photo

1990 Annual Report

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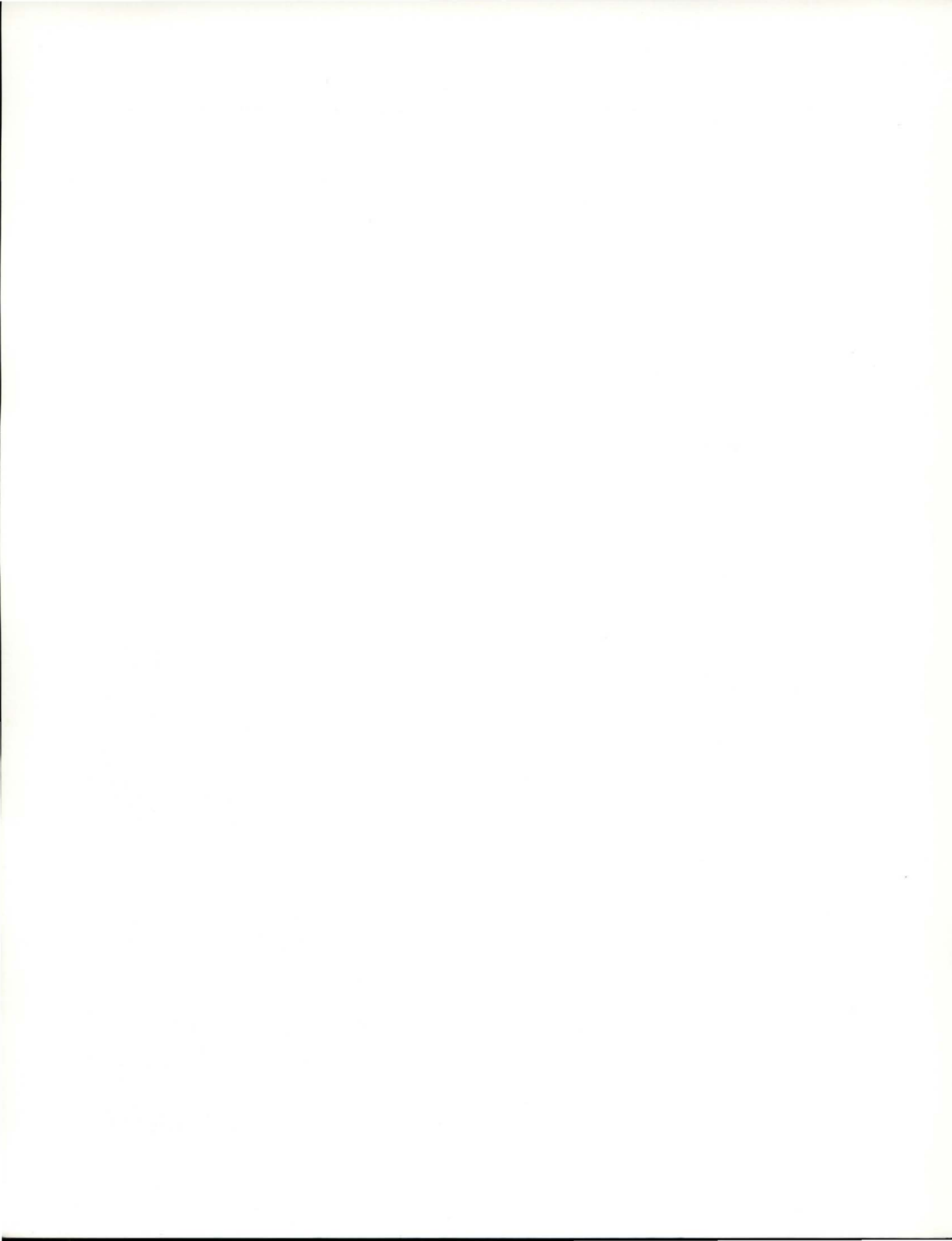
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When Hard Luck Cattle Co. and Little Lost Angler Assoc. Sit Down Together—Coordinated Resource Management Workshops

Kenneth D. Sanders, Neil Rimbey, and Charles Cheyney

In his book *The Oregon Desert*, Reub Long, well-known rancher and desert philosopher, observed: "When there was only one man camped at the water hole, democracy was easy." Now there are many people "camped" at public rangeland water holes and conflicts over the use of our natural resources are commonplace.

Up until the 1950s, ranchers, miners, and hunters were about the only people using the public rangelands of the western U.S. But as urban areas grew and more leisure time became available, people began using public rangelands for recreational pursuits in addition to hunting and fishing. This motivated public land management agencies to emphasize managing rangelands for multiple uses. To add to this, growing public environmental awareness has directed yet more attention to publicly-owned natural resources and their management.

Unfortunately, this increased interest in and use of rangelands has given rise to conflicts between the various user groups of public lands. Well-intentioned but often poorly-thought-out laws and regulations were written governing the management of public resources, regulations that did not always consider long term consequences or potential impacts on all the various groups. Lawsuits were filed and conflicts increased. Eventually, a few people began to think there might be a better way to resolve conflicts than through litigation. Thus the concept of Coordinated Resource Management (CRM) was born, and has proven over the years to be an effective way to resolve conflict.

Coordinated Resource Management refers to both a concept and a process. The concept of CRM is this: if reasonable people, despite their differences of opinion, get out on the ground together and truly communicate with each other, they can reach agreement on how the resources in a given area should be managed. The process of CRM is that of bringing together resource owners, managers, and users so that they can, through cooperation and coordination, develop and implement resource management plans for all major resources and ownerships within a specific area.

A pioneer of the CRM process, mostly in Oregon, has been William Anderson, 1939 UI graduate in range

resources. Lee Sharp, professor emeritus of range resources, instigated the approach in this state in a May 1970 workshop in Burley, Idaho, involving ranchers and agency range conservationists and wildlife biologists. Sharp utilized the "role reversal" concept and, to provide an example of CRM, conducted the workshop on the Malta, Idaho ranch of Jack Pierce, a member of the college's Guidance Council and the first rancher in the state to use a coordinated management plan on his ranch. He assigned participants reversed roles in the development of a coordinated ranch plan. Ranchers assumed the roles of conservationists or wildlife biologists and agency personnel took on the ranchers' roles. Sharp felt this role reversal helped break down stereotypes and increase understanding of all of the different viewpoints.

The workshop was so successful that Charles Chey-



James Mital

Regional Highlights

ney and Range Professor and Management Specialist Kenneth Sanders held a similar workshop in 1986, and since then have used the same approach in CRM workshops. From the role reversal concept Chaney created the "Bum Steer Allotment Game," subsequently revised by Caldwell Extension Range Economist Neil Rimbey.

The Bum Steer Allotment Game provides sufficient information about a fictitious grazing allotment to allow participants to develop a management plan. Characters representing the various agencies, users, and interest groups have also been developed, and the characters' names, features, and roles are written in a humorous vein to keep the game interesting.

Following some instruction from us on the CRM process and on group communication in general, participants are divided into planning groups and assigned the roles each participant is to play, roles like Joe Cigar of the Hard Luck Cattle Company, Ranger Rodney of the Forest Service, Max Profit of the Idaho Department of Lands, Bob Blaster representing the Rim Rock Motorcycle Club, and Barb Hook for the Little Lost Angler Association, among others. The characterizations are written not as individuals might perceive their own professions, but as the stereotypes that others often perceive them to be. However, the management objectives of the allotment are realistic for the roles being played. For instance, Joe Cigar wants to maintain a cow-calf operation of 175 cows and Barb Hook wants to improve fishing and camping facilities. To further enhance the realism of the situation, participants are randomly assigned other behavior traits outside the stereotypes, for example someone plays the role of peacemaker, another constantly attempts to disrupt the meeting, and so on.

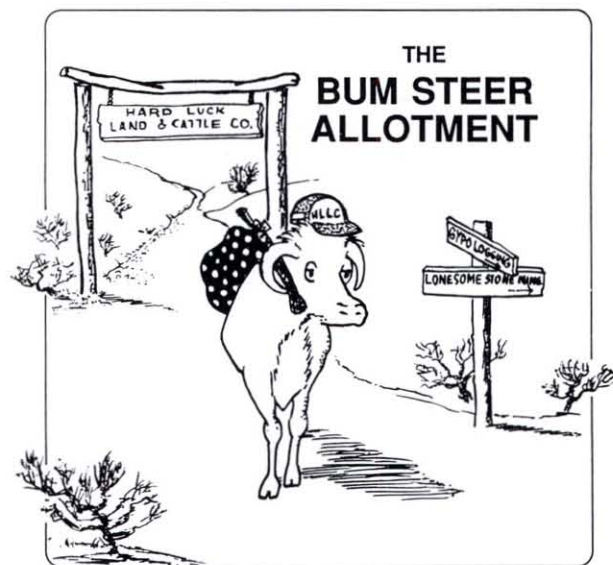
Even the arrangement of tables is important. Remember how in the early 1970s the U.S. and North Vietnam argued for weeks about the shape of the negotiation table in Paris? We intentionally arrange tables and chairs for each group in a manner that makes group communications difficult, and with the stage thus set, we charge the groups to develop a coordinated plan *by consensus* within a 2- to 4-hour period.

It has been interesting and informative to observe the groups as they organize and develop a plan. Some have immediately rearranged the chairs and tables, while others have struggled to communicate with the setup provided. Some individuals immediately "take" to their new roles, sometimes much to the chagrin of the person with whom they traded roles. Others must struggle to put themselves in the shoes of someone they normally disagree with.

The workshops conclude with each group presenting a brief report on how they organized themselves, problems

they encountered while working together, and their group and individual perspectives on the CRM process.

Most participants have given the workshops high marks. One participant who had become extremely upset at how his counterpart portrayed his agency—later apologized and indicated that the game was very valuable in showing him how others apparently perceive his agency. A rancher said he had come to the workshop thinking it impossible to work with agency personnel, but learned that they were really no different than he was, and that he could indeed work with them. He even invited several of the agency people in his group to visit his ranch.



The Bum Steer Allotment Game is used only in Idaho. We conduct CRM workshops wherever they are requested, in Boise, Challis, and Mackay thus far. Besides ranchers, the workshops have attracted representatives from the Bureau of Land Management, the Forest Service, the Soil Conservation Service, the Idaho Department of Fish and Game, the Idaho Department of State Lands, the Idaho Conservation League, and county agents for the university's Cooperative Extension System.

Kenneth D. Sanders is professor of range resources and range management specialist at the University of Idaho Cooperative Extension District III Office in Twin Falls. Neil Rimbey is extension range economist in Caldwell and Charles Cheyney is Butte County extension agricultural agent working in Arco. Instructors for the 1990 workshops were K. Sanders; N. Rimbey; C. Cheyney; Joe Zimmer, affiliate faculty member, former BLM deputy state director, and owner of Zimmer and Associates Management Skills, Inc.; and Kendall Johnson, professor and department head for the Department of Range Resources.

Hands on the Industry, The Mill Studies

Editor, with Richard L. Folk and Robert L. Govett

It is a gray day, threatening rain as the four Forest Products 477 and 577—Wood Products Processing students (of a class total of eight) make the journey to Orofino, Idaho, for one of two all-day class sessions at the Konkolville Lumber Company sawmill. The university van meanders along the shortcut between Moscow and Orofino, up the steep Kendrick grade, a drive of narrow lanes and sharp curves, past the typical north Idaho scenes on a Wednesday in April—the green open wheat and hay fields, country mailboxes leaning into the road, deer grazing almost unnoticed in roadside pine and fir shade, even an old hunter teaching his grandson how to use a rifle down in a gully alongside this twisted Idaho byway.

After Dan's recollections of a logging operation he noticed while on vacation and Pete's nervous curiosity about the summer natural resources job awaiting him in Oregon, forest products instructor Richard Folk gives a briefing from behind the steering wheel about the lumber recovery and quality control study they will be doing at the mill today, starting with some background on the mill itself.

Located on Orofino creek in Orofino, Idaho, the family-owned Konkolville Lumber Company is managed by Don Konkol, a 1957 UI graduate. His 55-employee operation produces about 25 million board feet annually of red and white fir dimension lumber, and also some cedar, hemlock, and ponderosa pine. The company also operates a restaurant, bar, and motel—a good example of a family-owned sawmill business, Folk notes.

This mill relies on contract loggers who work mostly private timberlands, Folk explains, and has flexibility because it sells lumber of various species and sizes. It also produces planer shavings for pulp, particleboard, fuel, and animal bedding; wood chips for pulp; and hog fuel (bark) for the boiler that sits beside the creek feeding low pressure steam to the dry kiln.

The sawmill complex consists of a beaver mill with four adjustable cutters that transform logs into "cants" or square timbers by chipping away the four round sides of a log (creating the mill's supply of wood chips), and a computer-assisted band mill with a double-cutting headrig that "squares" or trims their sides, producing also-useful sawdust and side lumber in the process. The bandsaw is especially efficient because it travels back and forth on its own



Robert Govett

The Mill Studies allow students to practice hands-on wood utilization skills while helping to increase the efficiency of local mills.

along the edges of the log, producing much less sawdust and saving time because it cuts in both directions. Two mechanical edgers then saw the cants into two-by-fours, two-by-sixes, two-by-eights, two-by-tens, and two-by-twelves, and the new lumber passes steadily along constant-moving chains from the mill to high up on a bridge over the creek and back down to the yard to be sorted and hand-stacked on the green chain. Lumber not yet dried in the dry kiln is "green." All the lumber is finally dried in the dry kiln and surfaced in the planing mill before heading out to wholesale distribution centers, office wholesalers, and large building contractors.

Once at the mill, students and instructors waded through the mud and ponded rain that stretches across the log yard on their way to two piles of logs that the scaler has had stacked where the students can get to them. Instructors include Richard Folk, Forest Products Associate Professor Robert Govett, and Max McClintick of the Wood Use and Design Program.

First-timers get a tour of the mill from veteran mills studies graduate student Nathan Hesterman, Ph D student in Wood Construction and Design. Back out in the log yard, they'll work in teams of two or three, to the sweet hot smell of wood steam escaping from the dry kiln—drying pine today, and the loud rhythm of logs rolling over conveyer belts, dropped onto the sawmill carriage to be sliced, rotated, and sliced again by the 60-foot-long computer-guided bandsaw blade in just seconds—an example of sawmilling equipment typically in use throughout the industry in Idaho.

Today the students test the efficiency of each headrig by running nine different diameters (nine classes) from 5 to 24 inches through each machine center. Armed with tape measures, calipers, brushes, and paints of off-white, yellow, bright red, hot pink, bright green, black, etc., they identify five or more logs of the same diameter and measure and paint the ends (a different color for each diameter). By identifying the paint colors at the boards' ends once they

reach the green chain, they can determine recovery by measuring the lumber produced after the logs have been sawed.

The students are measuring log-to-lumber conversion. They want to know: is this mill getting as much volume out of the logs as possible with as little waste as possible? How efficient are the people and equipment, and the computer system? After they have finished the assignment, the company will discuss their results with employees at a meeting to see if improvements suggested by the results can be implemented.

This activity is one of "the Mill Studies," begun in the early 1980s by wood products Associate Professor Robert L. Govett, with the purpose of "training students and helping mills," he states simply. Today's study is the third to take place at this particular mill. Students have tested lumber recovery and quality control for several area mills over the years, with Govett sometimes branching out by himself to help mill operations in Oregon and Washington as well. The Mill Studies now come under the purview of the Wood Use and Design Program.

Max McClintick points out that "this activity is an example of what a university can do for a mill, and what a mill can do for a university [student]." He continues, "Any mill that asks us to come out, we'll do it—this is what we mean by 'outreach' in the Wood Use and Design Program." Graduate student from Honduras Roberto Avila adds: "I like this kind of a study because this mill does it the way we would like to do it in Honduras; I will use what I'm learning here when I'm working back in Honduras." Graduate student Nathan Hesterman sums it up this way: "We get to observe mill operations once in awhile, and you can talk about it all you want in class, but that's not the same as *doing* it . . . The mill study is one of the few chances we get to work in an actual mill setting . . . We're doing something useful, and I think the mill owners appreciate it too . . ."

Some shoptalk and light review on the way home ends a long day for students in this year's reputedly demanding mill studies course. They have taken part in an economically and academically significant exchange: their study at the mill will make their classroom work more relevant, their wood utilization skills more practical, and the Konkolville Lumber Company Sawmill—more efficient.

Robert L. Govett was associate professor of forest products until June 1991, when he began his new position as Distinguished Professor of Forestry in wood utilization and marketing at the University of Wisconsin, Stevens Point. Richard L. Folk is an instructor in forest products and Max McClintick is fundraising campaign director for the Wood Use and Design Program.

Executive Leadership of Political and Social Forces in Natural Resources

Walter Dunn

The increasingly complicated natural resource decisions we face on our planet demand effective conflict resolution skills on all sides. Our ability to deal with our differences could determine our success, perhaps even our survival. But these conflicts involve complex people problems—social, political, and communication challenges that reach far beyond the technical training many decision-makers and resource managers receive. What skills do today's resource managers need?

- * Conflict Resolution *
- * Consensus-Building *
- * Mediation *
- * Negotiation *

In 1987, Dean John Hendee along with then-Associate Dean for Academics and Continuing Education James Fazio and others of the college's faculty met with representatives from four U.S. Forest Service regions to discuss ways to improve the social, political, and communications skills of natural resource managers. They designed the five-day shortcourse "Executive Leadership of Political and Social Forces in Natural Resources."

Now-Associate Professor of Forest Resources Penny Morgan headed instruction of the first executive leadership course in Moscow in April 1987. Since my joining her in 1988 as course developer and coordinator, we have brought together participants from the U.S. Forest Service, USDI Bureau of Land Management, Idaho Department of Lands, Alaska Division of Forestry, Forestry Division of the State of Washington, Montana State Department of Lands, Montana Department of Fish, Wildlife and Parks, Champion International Timberlands, Boise Cascade Corporation, and the Tule River Tribal Council.

The heart of the course consists of developing the conflict resolution skills needed to manage diverse viewpoints and build consensus. Negotiation and mediation skills are central to this development. The objective is to improve resource managers' skills for developing community-accepted decisions by increasing their understanding of social, political, and organizational processes, and by improving their interpersonal communication and leadership skills.

The course flows from the specific to the general, from a local to a global perspective. On the first day, we ask participants to identify a leader they respect, and list the qual-

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ities that make that person an effective leader. Subsequent discussions include analyses of the elements of effective leadership, community and organizational behavior, the partisan politics of policy making, and effective public involvement.

We challenge participants to think globally by exploring the problem-solving techniques that natural resource managers use in different cultural settings. Foreign Student Coordinator Michael Whiteman and I lead a discussion with international students in the college to examine natural resource management problems around the world, giving participants a new perspective on the problems they face at home. Course exercises focus attention on the local and global perspectives of resource management problems.

The local perspective. A key component of the course is an all-day field trip designed by Gary E. Machlis, sociology project leader of the Cooperative Park Studies Unit and professor of forest resources. The objective is to examine the impact of natural resource management policies on the social fabric of a resource-dependent community. Our group visits with the town's police chief, with rural health nurses at the hospital, with high school students, county commissioners, bankers, business owners, and religious leaders. We have even strolled through town cemeteries to study the historical roots of these Idaho communities, which have thus far included Lapwai, Orofino, Potlatch, and St. Maries.

When Whiteman and I make our first contacts to plan the field trip, the local people look at us strangely when we tell them our plans. Health care workers, ministers, and police officers often tell us that natural resource policies have no effect on them. However by our second visit a few weeks later, our hosts have often thought of a number of ways these policies affect their lives.

During the field trip, we ask participants to listen carefully, ask questions, and refrain from taking defensive positions or advocating their points of view. This is a difficult promise for them to keep when, as often happens, they feel that community leaders "don't have the facts straight." The field trip thus provides the perfect vehicle for emphasizing that perception is reality when it comes to public opinion and community involvement.

To provide a broad perspective, we invite university academicians and real world practitioners to share their perspectives with the group. For example, a television talk show host conducts mock interviews on camera to improve participants' abilities to deal with difficult questions, and newspaper reporters offer tips on dealing effectively with the press. University professors also explore social and technical trends that will shape natural resource management decisions in the future.

In addition, internationally recognized leaders share

their views on conflict resolution and leadership. Guest speakers have included Ambassador Philip Habib, U.S. Special Envoy; Ian Player, founder of the World Wilderness Congress and the Wilderness Leadership School; Max Peterson, chief emeritus, U.S. Forest Service; Oren Lyons, chief of the Turtle Clan of the Onandaga Nation of the Iroquois Confederacy and director of Native American Studies at the State University of New York at Buffalo; Bill Shands, senior associate at the Conservation Foundation; and Frank Gaffney, project director at the Northwest Renewable Resources Center in Seattle. Faculty from Boise State University, Washington State University, the University of Alaska, and from the UI's own colleges of Law, Business, and Letters and Sciences have shared their perspectives as well.

In response to the popularity of the executive leadership course, I have designed two new courses. In February 1991 the tribal leaders and natural resource managers of 14 tribes attended the seminar "Executive Leadership of Political and Social Forces in Tribal Natural Resources Management," developed in conjunction with the Bureau of Indian Affairs (BIA) and the Intertribal Timber Council. And in Spring 1992, "Planning and Facilitating Meetings for Successful Public Involvement" will take place in May at the UI McCall Field Campus.

Our ability to deal with our differing views on natural resource management will determine our success and ultimately—the survival of the resources we depend on. That's why courses like these are essential. When resource managers tell me the course helped them to see "the big picture" and gave them "a whole new insight and view on resource management," they reaffirm my belief that people of diverse interests and values can work together to build durable, equitable resource management agreements for a sustainable future.

Walter Dunn is program manager of the college's McCall Field Campus in McCall, Idaho. A 1987 graduate of the University of Arizona with a master's degree in watershed management, he focused his research on development of a fuelwood management plan and on benefit-cost analysis for subsistence farmers in the Ecuadorian Andes. Dunn also has extensive experience facilitating multi-party environmental disputes in the United States, Central America, and South America.

Faculty and staff in the college who have participated in the executive leadership course include J.E. Force, G.E. Machlis, C.W. McKetta, P. Morgan, and M.W. Stock of the Department of Forest Resources; A.A. Moslemi of Forest Products; L. Nelson of Fish and Wildlife Resources; W.J. McLaughlin and S.H. Ham of Resource Recreation and Tourism; J. O'Laughlin, director of the Policy Analysis Group; J.C. Hendee, dean; Michael Whiteman, foreign student coordinator; Carol Spain, coordinator for the college's Employment Services and Continuing Education and Outreach; and R. Dacey from the College of Business.

Good Advice: Student Heads County Parks and Recreation Department

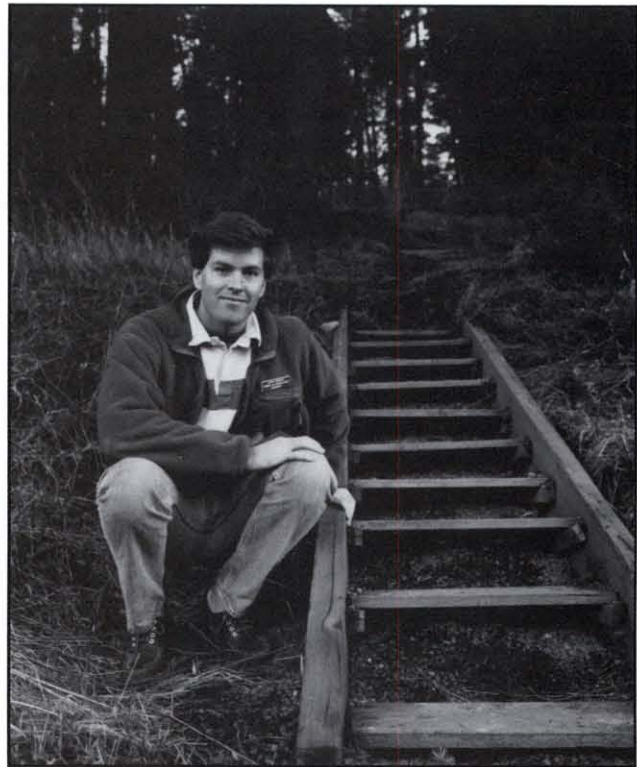
Danny Markus

Thank heavens for good advice. You see, I wasn't quite sure what to do after I graduated from Indiana University in May of 1990. With a Master's degree in Parks and Recreation, there were several options, but I felt there was still much more I needed to learn. When I talked the situation over with one of my professors at Indiana University, himself a University of Idaho alum, he suggested I look into furthering my graduate education at the UI. I was unsure about how to pay for more schooling, but his idea sounded like a good one, so I plowed through the necessary paperwork and sat back to wait for an answer.

To my delight, I was not only granted admission to the PhD program in Resource Recreation and Tourism, but there was an opportunity for a graduate assistantship as well. In exchange for student management of the county Parks and Recreation Department, Latah County would provide funding for the graduate student as well as furnish housing at one of the county parks—Robinson Lake. Still 2,200 miles away, the arrangement sounded too good to be true, but I gratefully accepted the position and looked forward to moving to Moscow in July to begin the job before Fall classes started.

With my little Chevy Sprint jammed with all my possessions including a 17-foot yellow canoe strapped on top, I made the long journey from Bloomington to Moscow. My place at the park was not yet ready, so I stayed with my major professor, Ed Krumpke, and his family for the first few days. Their warmth and hospitality went a long way in smoothing my transition to a new and strange place.

I must admit, I was a bit confused when I got out to my new home at the park to discover that the lake was missing, but no matter. Robinson Park (the official new name) is picture postcard pretty, and I knew I would enjoy country living. Originally built in the 1930's on land donated to the county by successful local businessman Frank Robinson, the small reservoir provided a place for folks to cool off and enjoy a picnic just six miles from Moscow. However, the lake frequently filled with sediment from the upstream erosion of a nearby Palouse River tributary, and in 1970 the county commissioners and Park and Recreation



Gerry Snyder

His domain: PhD student Danny Markus shows off the wooden stairs he built to ease the hikes of local walkers at Robinson Park.

Board decided to permanently fill it in. Currently, the 52-acre park consists of open play fields surrounded by a beautiful mixed stand of Douglas-fir, ponderosa pine, and grand fir.

Anxious to start my new job, I immediately met with the people to whom I would report throughout the project—the three Latah County commissioners and the seven members of the Latah County Parks and Recreation Board. Given the fact that we were all breaking new ground with this position, they gave me a fair amount of latitude and a great deal of support and encouragement.

In addition to Robinson Park, the county park system also includes Moose Creek Reservoir near Bovill and a small neighborhood park in the town of Harvard. Much of my work the first few months was simply routine maintenance and some fine tuning of the parks themselves. I worked up a lot of sweat cleaning out fire pits, digging up new horseshoe playing areas, putting in posts, building steps for the steeper parts of the nature trails, etc., and ended the summer months satisfied that the program was off to a good start.

Beyond simply improving the existing parks, another important task has been to heighten public awareness about Latah County Parks and Recreation (LCPR) and to serve the recreation needs of local residents. To that end I have

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participated in a number of activities, such as marching in the local Centennial Parade, mingling with park visitors, organizing a handful of community events, and actively participating in local projects related to parks and recreation. Two LCPR community events were particularly successful. In August, Bovill residents and even the LCPR Board members all chipped in for a major clean up day at Moose Creek, and had a lot of fun too. At Halloween time, local children were treated to "Spooky Sunday" at Robinson Park, an event coordinated with the UI fraternity Delta Tau Delta. Even with our presently limited budget, the LCPR along with talented and enthusiastic volunteers can accomplish much to enhance recreational opportunities in this county.

The most pressing need of Latah County Parks and Recreation is a comprehensive planning document, and that is what I am currently developing. When complete, it will chart LCPR's course for the next five years. It will also enable me to focus my efforts on the priorities identified in the plan. With public involvement and a better understanding of park and recreation resources already present in the county, LCPR can devote time, money, and energy to where they will do the most good.

According to the terms of the cooperative agreement between the county and the UI, I am obligated to devote twenty hours a week to LCPR-related activities. Since I truly enjoy the time I spend working in the parks and promoting the park system, sometimes I worry about finding time to devote to my academic program. Fortunately, I have been able to strike a balance between the two worlds and feel comfortable with my achievements in both areas. The faculty and my colleagues in the college have proven to be very supportive and I consider myself fortunate to be a student here.

Three instances in particular come to mind as examples of this support. Graduate instructor Jo Tynon assigned her Recreation Operations and Facilities Management class a term project involving the development of improvements at Robinson Park. Some of her students' recommendations are providing the basis for projects actually now on-line,

including the 1991 construction of an amphitheater. In another example, Forest Resources Assistant Professor Charles Stiff encouraged two students in his Forest Measurement Techniques class to examine the stand of trees at Robinson Park. Their findings will form part of an overall study of how to maintain a healthy forested ecosystem at the park. Another student, supervised by Associate Extension Professor and UI Experimental Forest Manager Harold Osborne, is now putting their data into practice. And finally, Professor Charles Hammersley of the College of Health, Physical Education, Recreation and Dance allowed two groups of students in his Funding and Marketing of Recreation Agencies course to work on preparing two grants that would benefit LCPR.

Already plans are underway to mobilize more of the college's students to help LCPR accomplish both long and short term objectives. It is a win-win situation for both parties—students gain practical experience with the chance to grapple with real world situations while the county benefits from the input of many bright and eager minds. In effect, when the county hired me to manage Parks and Recreation, they actually hired hundreds of other talented students as well.

I am very excited about being the county's first parks and recreation manager. I applaud those who made this opportunity available to me and I will continue to take pride in what it is we are attempting to do. Clean parks and wholesome worthwhile recreation opportunities can contribute to the quality of life for citizens of Latah County and for University of Idaho students also. In terms of University outreach and service, this program is a clear demonstration of the benefits flowing both ways.

Danny Markus is a Ph D student in the Department of Resource Recreation and Tourism. He brings to the new county position a Bachelor's degree in Business (1982), a Master's of Business Administration (MBA, 1983), and a Master's in Parks and Recreation (1990), all from Indiana University, Bloomington. His advisor, Edwin E. Krumpe, is an associate professor in the same department.

Bringing Business and Industry to the Classroom—Wood Products Academies

Thomas M. Gorman and Max McClintick

“Overall this academy was the best presentation concerning the forest products industry I’ve attended.” —Lynn Coffman of Brand S Lumber, Livingston, Montana.

One of the exciting new programs to be developed as part of the Wood Use and Design Initiative at the college is a series of shortcourses aimed at providing formal education for forest industry professionals in the Pacific Northwest.

Based in the Department of Forest Products, the UI Wood Use and Design Program is a unique plan developed over the past two years to benefit wood products industries through formal education, outreach activities, and innovative approaches to research and development.

“Formal education” thus far refers to the Wood Construction and Design curriculum, established in 1989. Developed by faculty of both the Department of Forest Products and the Department of Architecture, the new curriculum is the only undergraduate program in North America to combine wood construction with the traditional design disciplines; the option integrates courses in forest products, wood technology, business, and design. “Innovative research” means that forest products faculty continue to investigate the potential for “value-added” or secondary manufacturing opportunities that could boost the timber industry in Idaho.

But what Lynn Coffman of Brand S Lumber was so enthusiastically describing is one of the outreach activities: the increasingly popular Wood Products Academy, part of a series of technology transfer programs that will also eventually include consultation teams, conferences, workshops, shortcourses, and other means to communicate value-added opportunities to the wood products industry.

The Wood Products Academy series is funded by a grant from the Northwest Area Foundation and by funds raised from the industry itself to support the college’s Wood Use and Design Program. The series was developed by forest products industry leaders in cooperation with the Department of Forest Products. A team from the department visited primary and secondary manufacturers to discuss sub-

ject matter to be taught in the courses, and from that input the academy series has evolved. Industry owners and managers have praised the college for its leadership in establishing and teaching the Wood Products Academy:

Charles P. Grenier, vice president of Plum Creek Timber Co., L.P., Rocky Mountain Region: “We are pleased to support the UI Wood Use and Design Program . . . and encourage other firms to likewise lend their support . . . Its activities directly address problems facing the forest industry.”

Participants as well are grateful for the academies:

Dick Costin, Idaho Forest Industries, Coeur d’Alene, Idaho: “I would highly recommend this program to anyone connected with the forestry and wood products manufacturers . . . it definitely would be time well-spent.”

Devon Owens, Kaibab Industries, Panguitch, Utah: “One of the most informative and interesting weeks of my life . . . that should help me do my job a lot better . . .”

Sandy Christian, Plum Creek Timber, Pablo, Montana: “For someone like me, an accountant wanting to eventually move into more of the production side of the industry, it was great. It gave me a good base that I can now take back to the mill and apply to our individual process.”

Thomas Bryson, Boise Cascade, Emmett, Idaho: “I will highly recommend your program to my supervisors. It was very informative and broadened my sense of awareness of the timber industry, past and future.”



Leonard Johnson

Essentially anyone who is involved in the forest products industry will find a course within the academy series that meets their needs. Plant managers, shift supervisors, material purchasers, quality control supervisors, and even bankers and accountants have attended the academies, representing not only Idaho, but Oregon, Montana, Wyoming, Utah, and Arizona. Faculty from the UI, Washington State University, and private industry address a variety of topics on wood products marketing, manufacturing, and properties and technologies.

We started with a week-long academy in Moscow June 11-15, 1990, that would provide an educational foundation for in-plant work force leaders. The course covered topics such as forest management, the microcellular structure of wood, wood properties, and the production and marketing of various wood products. We augmented classroom lectures with field trips to area mills, the UI Experimental Forest, and the nearby Washington State University Wood Materials and Engineering Laboratory.

Following this same format, the second shortcourse in the series (Sept. 17-21, 1990) was for non-forest products professionals who work closely with the wood products industry and wish to gain a better understanding of how the industry operates. Another academy took place April 8-12, 1991 and the one on quality control June 18-20 trained quality control personnel, supervisory personnel, and sawmill managers how to run public domain software programs for lumber product size analysis, target set reductions, "Best Opening Face" sawing simulations, log analyses, and other specialized calculations.

The three tentatively scheduled Wood Products Academies for Fall 1991 include one on wood composites and another on forest products marketing.

The academy series has drawn participants from some of the best known wood products firms in Idaho: the Potlatch Corporation, Boise Cascade, Bennett Lumber Company, Plum Creek Timber Company, Riley Creek Lumber Company, Kaibab Industries, Konkolville Lumber, Idaho Forest Industries, and others.

Thanks to the Wood Use and Design Program, the first academies have sent numerous graduates back to their companies to share their new information, information that may mean a healthier future for the forest products industry in Idaho.

Thomas M. Gorman is assistant professor of forest products. Along with Robert L. Govett, associate professor of forest products, and colleagues in the Departments of Forest Products and Architecture, he helped develop the Wood Use and Design Program. Former business executive Max McClintick is a member of the original Wood Use and Design Steering Committee, coordinator of the Wood Products Academies, and fundraising campaign director of the Wood Use and Design Program.

Opportunities and Problems: Forest Soils Symposium

*Alan Harvey, Leon F. Neuenschwander,
and James Mital*

Long term sustainability for productivity in forest ecosystems is inherently reliant upon productivity of the soil, thus this resource should be carefully managed. After all, soil is essentially a non-renewable resource. Yet as important as soil is to forest health, forestry soils expertise is declining, largely because a high number of forest soils experts are expected to retire within many western universities and in research and management agencies like the U.S. Forest Service. The Forest Service provides a prophetic example: that agency alone currently has 185 employees working as forest soils professionals, but is projecting loss to retirement of 44 of these experts over the next five years. The Forest Service predicts it will need to hire 70 new soils scientists to replace these retirees.

At the same time that the forest soils discipline is witnessing this diminishment of its experts, demand for forest soils expertise is increasing for a variety of reasons; these include a growth in site-specific forest plans throughout the nation, global climate issues, acid rain issues, long term forest productivity and health issues, demands for clean water, new technology (primarily GIS-mapping of forest productivity), and a growing demand from international research communities for forest soils expertise. The demand for this expertise already exceeds what is currently available, and we expect the increase to continue.

A major reason, then, for conducting the "Management and Productivity of Western-Montane Forest Soils Symposium" was to capture the expertise of soon-to-retire forest soils experts, and to make available that knowledge in a source document—the proceedings. The symposium itself allowed our participants to determine where we are headed and where we want to go with western-montane soils information needs.

Before the symposium, we interviewed all the NAPFSC schools (National Association of Professional Forestry Schools and Colleges) and those with accredited forestry schools in U.S. Forest Service Regions 1 to 6, as well as the Pacific Southwest, the Pacific Northwest, the Intermountain, and the Rocky Mountain U.S. Forest Service Experiment Stations. Of the 26 forestry schools we contacted, 12 have no resident forest soils faculty, and only 4 employ more

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than one soils expert. Except for professors who dabble in forest soils, the UI also has no forest soils experts. From the student angle: 17 schools require their forestry graduates to have completed a general soils course, 7 require coursework in forest soils specifically, and 2 require both. Only 7 schools offer graduate courses in forest soils.

Worse yet, throughout the nation, there are currently only 36 students seeking Master's degrees in forest soils, and 23 seeking PhD's. Half of these are international students, and expected to return to their home countries. Eighteen of the master's students and 12 of the doctoral students are studying in schools west of the Mississippi River. Yet soon, agencies like the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, and the Environmental Protection Agency will all be competing for the very few graduates with forest soils expertise.

Our concern over this decline in expertise in part spawned the symposium we conducted in Boise April 10-12, 1990. Such a symposium has never been held in the northern Rocky Mountains. It was sponsored by the USDA Forest Service Intermountain Research Station and the University of Idaho.

The objectives of the symposium were: one, to provide "state of the art" publications on the nature and problems of integrating soils information and expertise into the management of Inland Western ("western-montane") forest resources. The symposium did this by generating awareness of the lack of information, by making limited existing literature more available (through the proceedings), and by facilitating technology transfer by providing appropriate interpretation of that literature. Two, we wanted to point out the current crisis in basic forest soils information inventory and related expertise, and the inadequate educational resources for continued development of such expertise in the Inland West. We plan to achieve this by following up the symposium with journal articles and by generating a plan among the participants for reaching policy-makers. Three, we hope to develop a consensus recommendation for scientific, resource management, and political communities on what action should be taken to fill the gap this shortage is creating.

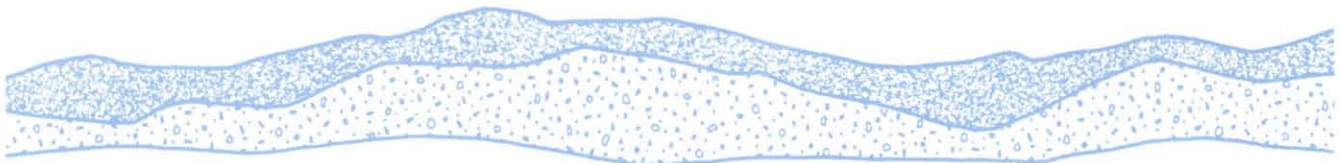
Speakers addressed many aspects of soil distribution

and development; soil-vegetation interactions; soil productivity; soil alterations, damage, and restoration; soil information management problems; and potential soil alterations in the future.

Our 150 participants, including 30 speakers, consisted of forest soils experts, silviculturists, regeneration specialists, and technical practitioners, as well as supervisors and managers, from all the western states. They represented agencies like the U.S. Forest Service, Soil Conservation Service, Bureau of Land Management, Bureau of Indian Affairs, and also private timber companies, timber consulting firms, and university scientists.

Attendees felt the symposium and resulting document would provide critically needed guidance for managing inland western forest soils. We hope raising the issue of the impending information and expertise shortage will be a first step toward developing some solutions.

The organizing committee for this symposium consisted of Leon F. Neuenschwander, professor of forest resources, adjunct associate professor of range resources, associate dean for research and international programs, and associate director of the Idaho Forest, Wildlife and Range Experiment Station; Alan Harvey, project leader of the Forest Diseases and Microbiology of the Northern Rocky Mountains Project, U.S. Forest Service Intermountain Research Station (Moscow); Carol Spain, coordinator for Employment Services and Continuing Education and Outreach; and Jonalea Tonn, forester, USFS Intermountain Research Station. Members of the technical committee were David Breuer of Washington State University, Richard Fisher, Utah State University, Dale McGreer, Pottlatch Corporation (in Idaho), Martin Jurgensen, Michigan Technological University, Glen Klock, consulting forester for Western Resources Analysis in Wenatchee (Washington), Bob McDole and Leon Neuenschwander, University of Idaho, Dale Wilson, Region 1 Clearwater National Forest, Mike Geist, USFS Pacific Northwest Research Station in La Grande (Oregon), Jim Clayton, USFS Intermountain Research Station in Boise, Gary Ford and Jerry Niehoff, Region 1 Coeur d'Alene National Forest, and Deborah Page-Dumroese, Jonalea Tonn, Russ Graham, GERAL McDonald, and Alan Harvey, USFS Intermountain Research Station. Then-Graduate Assistant James Mital (now a forest soils scientist with the Clearwater National Forest) contributed with statistical background. The 1991 publication Proceedings, Management and Productivity of Western-Montane Forest Soils Symposium, General Technical Report, USDA Forest Service Intermountain Research Station (Moscow), edited by Alan Harvey and Leon F. Neuenschwander, is available from the U.S. Forest Service's Intermountain Research Station headquarters in Ogden, Utah.



Policy Analysis Reports Make a Difference

Jay O'Laughlin

Two years ago the Idaho Legislature established the Policy Analysis Group (PAG) as a unit of the College of Forestry, Wildlife and Range Sciences. The PAG is charged with providing objective analyses of the impacts of natural resource proposals in Idaho. Jay O'Laughlin is director of the PAG and Carla Wise is PAG research associate.

The success of the PAG depends on the willingness of faculty and other experts to apply their knowledge to the preparation of credible and timely reports. We ensure credibility by enlisting a variety of experts to review the reports. Timeliness means producing reports for policy makers while an issue is still current, which often translates into precious few months.

In all, the PAG has employed 16 different co-authors for its five completed reports and two currently active projects. The reports have been reviewed by 25 different faculty members from within the college, from other UI colleges, and from other universities. Technical reviews have also been requested and provided by 13 public agency representatives.

Thus far, the Policy Analysis Group has completed the following policy analysis reports for Idaho's citizens and decision-makers:

- No. 1 Idaho's Endowment Lands: A Matter of Sacred Trust. Jay O'Laughlin (March 1990).
- No. 2 BLM Riparian Policy in Idaho: Analysis of Public Comment on a Proposed Policy Statement. Kendall L. Johnson, Carrie Mosley, Jeffrey C. Mosley, Jay O'Laughlin (June 1990).
- No. 3 Idaho Department of Fish and Game's Land Acquisition and Land Management Program. Carla Wise, Jay O'Laughlin (October 1990).
- No. 4 Wolf Recovery in Central Idaho: Alternative Strategies and Impacts. Carla Wise, Jeffrey J. Yeo, Dale Goble, James M. Peek, Jay O'Laughlin (February 1991).
- No. 5 State Agency Roles in Idaho Water Quality Policy (Special Report to the Idaho Legislature). Allen C. Turner, Jay O'Laughlin (February 1991).

Report Number 1 describes the historical and legal background for management of 2.4 million acres in Idaho maintained by the Idaho Department of Lands "...for maximum long term financial return to the institution to which granted..." Public schools are the primary beneficiaries of these federal land grants that were made at statehood a century ago. A bill introduced in the 1990 legislature to amend the management imperative in the Idaho constitution to include as an alternative "...secure the greatest public benefits" was withdrawn by its sponsor after he read the report, saving legislators' valuable time, the costs of a referendum ballot, and the legal expenses involved in an attempt to alter the trust agreement between the state and the federal government.

Report Number 2 analyzes comments on mail surveys returned by 104 members of various organizations on whether or not the Bureau of Land Management's proposed Riparian Management Policy Statement addressed important public concerns (as identified in eight public workshops). As a result of the report, the BLM learned that the policy statement does address Idahoans' concerns about these sensitive ecological areas except for that of educational outreach, which has now been incorporated into the agency's final policy statement.

Report Number 3 outlines the history and purpose of the Idaho Department of Fish and Game's Land Acquisition and Management Program. Primarily an educational effort, the report informed voters about a referendum on the November 1990 ballot for an amendment to the constitution that would allow the department to make payments in lieu of property taxes to the counties where the department's 116,101 acres are located. Information in this report was cited in several newspaper articles. Voters approved the referendum and a bill to implement such payments was introduced in the 1991 legislature. The report was used during legislative deliberations, and the bill passed. However, the governor vetoed the bill for technical reasons that will be settled before a revised bill is introduced in 1992.

Report Number 4 analyzes three alternative strategies for restoring gray wolves to central Idaho, and the potential impacts of recovery on activities like grazing, hunting, etc. (see the following article).

Report Number 5, a special report requested by the Idaho legislature and funded by a special appropriation, examines Idaho water quality policy as a framework of laws and regulations that define agency responsibilities for maintaining water quality. The report finds that the legislature has assigned responsibilities carefully, resulting in little or no program "overlap." It also identifies 34 unresolved issues the legislature might address as it decides how Idaho should implement water quality programs required by the federal Clean Water Act.

The PAG's current studies include two active projects—an analysis of pulp mill feasibility in the Silver Valley, and a survey of Idaho citizen opinions about natural resource issues. Two projects to be initiated and completed by the end of 1991 are an analysis of forestry best management practices (BMPs) to guide designs for water quality protection on certain timber stream segments in Idaho; and a collection of brief "scoping" papers on forest management issues affecting timber supply and availability—issues including forest roads, wilderness, silvicultural methods, fish and wildlife impacts, sensitive plants, endangered species, fire management, log exports, recreation and tourism development, and others.

What difference do these reports make? They provide Idaho citizens and decision-makers with the most objective information available concerning a broad range of natural resource proposals. The reports have been widely distributed and read, and have altered the course of natural resource policy decisions by providing a credible and impartial information base.

For more information about the establishment of the PAG and its operations or for copies of PAG reports, contact Jay O'Laughlin in the College of Forestry, Wildlife and Range Sciences.

Jay O'Laughlin is director of the PAG, adjunct professor of forest products, and adjunct professor of forest resources. He is introduced in the 1989 issue of Focus (volume 15).

Shades of Gray— Idaho Wolf Recovery

Carla Wise

Wolves, effective and formidable predators of ungulates, tend to bring out powerful feelings in people. Whether you perceive them as noble symbols of wilderness and nature's beauty, or as vicious destroyers of innocent prey, you probably have a strong opinion about wolves.

Absent from the northern Rocky Mountains for over half a century, gray wolves have not been forgotten. Under the Endangered Species Act, the U.S. Fish and Wildlife Service has developed a wolf recovery plan that includes central Idaho as an area for wolf recovery. This policy has sparked debate, in Idaho and elsewhere. And the strong feelings that accompany discussions about wolves have made it difficult to base decisions on the best available information.

The Policy Analysis Group produced a report in February 1991 (based on research conducted in 1990) in an effort to fill a gap in information on wolf recovery in Idaho. Although there are biological studies on wolves, legal analyses of the Endangered Species Act relative to wolf management, and publications from various pro- and anti-wolf interest groups, we hope we have produced something new: a balanced, understandable review for the lay person that answers a number of key questions about wolf recovery and its potential impacts in central Idaho.

One reason the report is useful at this time is that three alternative strategies have recently been proposed for restoring wolves to central Idaho. A primary purpose of our report is to explain the differences among the three strategies and how the impacts of wolf recovery might differ under each strategy. Clarification of these differences should be useful to both citizens and decision-makers in Idaho as they seek a resolution.

The three alternative strategies are: (1) *Natural dispersal*—recovery of the species through recolonization by natural dispersal (on their own) from existing wolf populations in Canada and western Montana; (2) *Reintroduction*—recovery through a reintroduction program under the provisions of the Endangered Species Act: wolves would be transplanted from existing populations to central Idaho; and (3) *Federal legislative action*—an act of Congress authorizing specific activities related to wolf populations. Such action might involve a reintroduction program and delisting (removal of the wolf from the endangered list) outside a designated recovery area. Our report also includes

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a list of pros and cons for each recovery strategy.

Some other questions we address in the report include:

Are there wolves in Idaho? There has been no recent evidence of denning activity or of wolves breeding in the state. Sightings of lone wolves have been reported for decades. It is not known how many of these reports are valid, thus it is not known how many wolves are in Idaho.

Why is there a wolf recovery program in Idaho? The Endangered Species Act requires recovery efforts for all endangered species. The gray wolf is listed as an endangered species in Idaho.

What will happen when wolves prey on livestock?

A wolf control program to remove depredating wolves has been approved under the existing wolf recovery program, and is planned under all wolf recovery alternatives. The characteristics of the control program may vary depending on what type of recovery strategy is chosen. A control program would likely be directed toward resolving problems on a case-by-case basis.

What will wolves do to big game populations? Deer and elk will be their major prey. In areas where hunter harvest currently limits prey populations, the addition of wolf predation could cause a decline in prey numbers unless hunter harvest is modified. Wolves seem to have different effects under different circumstances, so the exact relationship between wolves and their prey in Idaho cannot be known until wolves are present.

Will the presence of the wolf mean road closures?

The majority of the currently designated wolf recovery area is roadless. Forty-eight percent is classified wilderness where roads are not allowed. Another large but uncalculated portion is roadless land and its fate has not been determined. In roaded areas, road closures happen at the discretion of the agency managing the land. Road closures are expected to be uncommon, but might occur for tem-

porary protection of den sites in the spring or to prevent illegal killing of wolves. This is more likely to occur while wolf populations are initially being established than after they have recovered.

Will wolves be endangered and protected as such forever? No, depending on how recovery proceeds. The U.S. Fish and Wildlife Service recovery plan has specific population targets for downlisting the wolf from "endangered" to "threatened" status and then delisting the wolf. Or, if wolves are reintroduced as an "experimental population" in Idaho, they will be treated as a "threatened" species.

Is central Idaho the only area selected for a gray wolf recovery program? No. Recovery and delisting in central Idaho is linked to the Montana and Yellowstone recovery areas. Three populations are considered necessary to sustain a viable wolf population in the northern Rocky Mountain region. The Great Lakes region (Minnesota, Wisconsin, and Michigan) also has a wolf recovery program.

Our report includes more detailed consideration of these questions, and others. It also explains the many areas of legal and biological uncertainty that cannot be resolved until wolves are again established in Idaho. The report was reviewed by seven wolf experts and published in February 1991 as the fourth report in the Policy Analysis Group report series.



Gerry Snyder

Recovery and delisting of the gray wolf in central Idaho is linked to the Montana and Yellowstone recovery areas, explains Carla Wise, PAG research associate.

Carla Wise is research associate for the Policy Analysis Group. Her co-authors for PAG Report Number 4, Wolf Recovery in Central Idaho: Alternative Strategies and Impacts are Jeffrey J. Yeo and Jim M. Peek in the Department of Fish and Wildlife Resources providing biological review and analysis, Dale Goble, professor of law providing legal analysis, and Jay O'Laughlin, director of the PAG providing writing and editorial assistance.

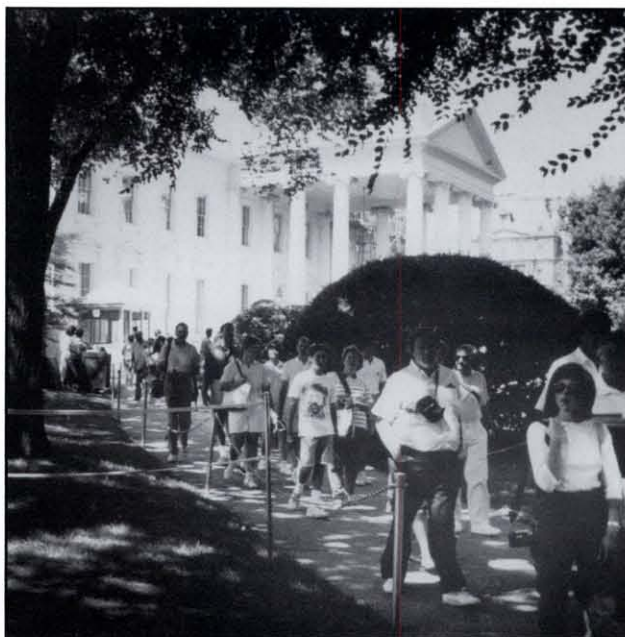
The White House Tours Visitor Studies by the UI CPSU

Dana E. Dolsen

Background Note: In August 1979, the University of Idaho and the National Park Service jointly agreed to sponsor a Cooperative Park Studies Unit (CPSU), a unit involved in the application of sociological and biological research to management of parks, preserves, and recreation areas. The CPSU is housed on the UI campus and administered within the college. Both the National Park Service and the University of Idaho contribute to the support of the CPSU, which is divided into two projects: one devoted primarily to sociological studies, a second dealing with biological studies. Professor Gary E. Machlis is sociology project leader and Professor Gerald Wright is biology project leader. Major funding for the CPSU comes from the Pacific Northwest Region of the National Park Service, and accordingly, the unit has a primary responsibility to Park Service areas in Idaho, Washington, and Oregon. The CPSU conducts many different kinds of studies, among them—the Visitor Studies Project (VSP) studies, operating under the auspices of the sociology project leader (see sidebar). The White House Tours studies are part of VSP Phase II of the three VSP phases and miscellaneous other studies that comprise the sociology branch of the CPSU's research.

An "American family heirloom," the White House is the First Family's home, the hub of the Executive Branch, and, for five days a week, a special public museum. The approach of the White House Bicentennial in 1992 has prompted a major restoration, and an assessment of the White House tour operation. That assessment is partially complete, the result of a 1989 National Park Service (NPS) summer survey of White House tour visitors that will help managers better understand and meet visitor expectations. The study was led by Gary E. Machlis, professor of forest resources and sociology project leader of the Cooperative Park Studies Unit (CPSU).

A National Park Service unit since 1961, the White House is also known as President's Park. Tours are jointly offered through the NPS, the U.S. Secret Service, and the White House Visitors Office. Two tours exist: (1) public tours with guides stationed in each room and tickets obtained on a first-come first-served basis, and (2) Congressional tours by reservation through either Representative



Margaret Littlejohn

Visitors stream past the north lawn of the only governmental leader's home in the world that allows public access, almost daily.

or Senatorial offices, with one guide assigned to a limited number of visitors.

The White House Tours study was conducted from June 28 through July 1, 1989, and the results published during 1990. Five hundred fifty-eight randomly selected Congressional and public tour visitor groups were interviewed and accepted mail-back questionnaires. Four hundred fifty-seven visitor groups returned questionnaires—an 82-percent response rate.

Approximately 70 percent of visitor groups were families, and at least half of all groups consisted of two to four members. The predominant age groups represented were adults aged 36-45 (about 28%) and children under 16 (30%). Californians and Texans composed the largest proportions of visitors from the United States, while only eight percent of public tour visitors and one percent of Congressional tour visitors were from foreign countries.

Seventy-six percent of visitors were on their first tour of the White House. To learn about their tours, almost half of all visitors relied on personal advice; 72 percent of Congressional tour groups consulted the offices from which they obtained their tour tickets; 48 percent of public tour groups used a travel guide or tour book.

An important finding was the length of time visitors waited to begin their tours: Congressional tour visitors waited an average of 45 minutes compared with the two and one-quarter hours that public tour visitors waited.

Visitors were asked to rate the quality of the services and facilities they used during their White House tour. Most services received high ratings, for example, 75 percent of

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all visitors rated the quality of the map/brochure and ranger assistance as "good" to "very good." Seventy-four percent of all visitors indicated that they would likely use a White House Visitor Center if it were available and nearby.

Another question asked visitors what subjects they would appreciate learning more about on a future tour. Both Congressional and public tour visitors named history, official events, and First Family information (past and present) as the top subjects.

To better acquaint officials involved in the White House tours with the study results and their implications, Machlis presented a series of workshops in Washington, D.C. Represented at these presentations were the U.S. Secret Service and White House personnel including the Chief Usher, representatives of the Curatorial staff and the Visitors Office, the Special Assistant to the President, and the Director of White House operations. National Park Service staff attending included the President's Park manager, and the White House Liaisons-Deputy and Associate Regional Directors, National Capital Region. Machlis made a special presentation to the Board of Directors of the White House Historical Association and distributed copies of a videotape (produced by the college's Natural Resources Communications Lab) documenting the results of the White House visitor study. Other information sources produced by the study were a final report and an appendix listing all visitor comments.

The summer of 1989 data revealed several important implications for managing the White House tours. For example, as Machlis pointed out, "Knowing that thirty percent of the White House visitors are children means there are all kinds of opportunities to change the tour to offer children's educational materials." Some public tour visitor groups also desired an improved reservation system—especially the process for obtaining tickets. In addition, several Congressional tour visitor groups offered suggestions for shortening the times that visitors wait for tours to start.

The National Park Service has contracted with the Cooperative Park Studies Unit for continued studies to better understand the needs of White House tour visitors. An additional survey of White House visitors was conducted in April 1990, and another is tentatively planned for the Fall of 1991. These additional studies will yield more useful information to help National Park Service and White House staff further improve the presentation of this important American home for those who visit the nation's capital.

Dana E. Dolsen is research associate for the University of Idaho Cooperative Park Studies Unit, and a graduate of the University of Alberta, Canada. He is also co-author of the final report National Park Service Visitor Services Project, The White House Tours, Summer 1989, Volume I.

The Visitor Services Project (VSP)

The Visitor Services Project (VSP) is a program of the University of Idaho Cooperative Park Studies Unit (UI CPSU) under the direction of Gary Machlis, professor of forest resources and sociology project leader of the CPSU. Its purpose is to provide the National Park Service (NPS) with easily understood, accurate, and useable information about park visitors. With such data, the planning and management responsibilities of park operations are enhanced, and hopefully, visitor experiences are improved.

According to Machlis, the VSP was created in 1982 when "the National Park Service recognized the need to develop techniques for learning more about visitors and their opinions." Machlis and his staff developed a survey-based technique that provides an easy-to-use, consistent, and inexpensive means of studying national park visitors. Based on on-site interviews and a mail-back questionnaire, the survey gathers the same general information for each park: visitor age, visitor origins, number of visitors, visitor group types, visitor activities at the parks, visitor spending patterns, and visitor assessments of the usefulness, importance, and quality of park services and facilities. It also collects information unique to each particular park as requested by park staff.

The VSP has conducted forty visitor studies in thirty-eight national park areas designated as national historical/cultural sites, which can include parks, scenic riverways, seashores, recreation areas, preserves, monuments, memorials, and battlefields. These sites preserving and reflecting American culture and history have included the Craters of the Moon National Monument, Death Valley National Monument, Glacier National Park, Yellowstone National Park, Statue of Liberty National Monument, and Lincoln's Home National Historic Site, among others.

In 1988, the NPS stationed two rangers at the university-housed unit to start conducting studies on a larger scale (about 10 yearly) to serve national needs. Margaret Littlejohn, western coordinator, and Dwight Madison, eastern coordinator, direct VSP studies as well as undertake special projects, for example the recently released publication *A Diversity of Visitors: A Report on Visitors to the National Park System* which describes some VSP study results from the past five years. It is available through the college's Publications Department; copies of each park report are available from the superintendents of each of the parks.

Below: Dwight Madison



Margaret Littlejohn

National Bioenergy Conference: A User's Perspective

Richard L. Folk and Leonard R. Johnson

Picture this: you are driving to your daughter's school in a car that uses alcohol fuel made from wood, rapeseed or sorghum, or wastepaper. The school is heated by methane gas extracted from the local landfill. On your way home you decide to stop to buy some milk—milk that came from a dairy that utilizes anaerobic digestion of barnyard manure to produce the methane that generates the electricity used to light the dairy and cool your milk. Are such futuristic processes possible, or just the stuff of science fiction?

In order to focus national attention on expansion of efficient and environmentally sound bioenergy technologies that are currently in use, we organized "Small-Scale Bioenergy Alternatives for Industry, Farm, and Institutions:

A User's Perspective," the first such conference in the changing bioenergy field since 1984, when a similar meeting held in Portland, Oregon, drew participants from five foreign nations. Our conference attracted 200 participants from 43 states and two Canadian provinces to Coeur d'Alene March 18-21, 1990. Energy consultants, engineers, researchers, and administrators explored the possibilities and implications of the many technologies for developing, marketing, and using U.S. bioenergy, a renewable energy that could, in many applications, replace or augment non-renewable fossil fuels.

Bioenergy is derived from biological sources (plants) rather than from fossil fuels such as petroleum and coal. Biomass energy is energy gleaned from by-products such as logging and milling residues, municipal garbage, feedlot manure, crop residues, orchard prunings, and cannery waste. More common examples of bioenergy are the heat from firewood, the new pelletized fuels for clean-burning residential stoves, and ethanol fuel distilled from various grains and wastepaper. Biomass already furnishes more than one-third of Washington state's industrial fuel, and is a traditional source of industrial heat and electricity in the forested states of the Northwest.

Addresses by state and federal energy administrators



Damian Sedney

Featured entertainment during the Technical Forum Session included springboard chopping, axe-throwing, underhand chopping, chainsaw vs. crosscut saw competitions, and "mom and pop" races like the one above, which required these married couples to spring out of bed, pull on oversized boots, wheelbarrow each other to the log, complete one slice through with a crosscut saw, and race back to the bed, repeating the whole sequence in reverse.

National Highlights

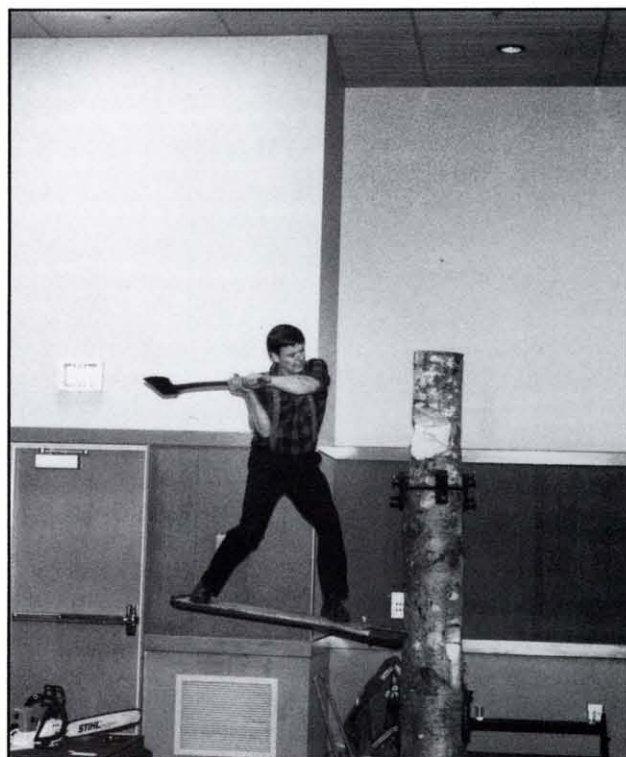
at the conference offered insight into the future role and direction that bioenergy or "renewables" might play within Idaho's and the national energy policy. Speakers included Oregon Republican Senator Mark Hatfield, Assistant Department of Energy Secretary Michael Davis, Director James Jura of the Bonneville Power Administration, Program Director of the U.S. Forest Service Forest Products Laboratory (Madison, Wisconsin) John Zerbe, and Keith Higginson, director of the Idaho Department of Water Resources, which oversees Idaho's state bioenergy program.

Thirty-five papers covered four subject areas: bioenergy development and application; bioenergy and the environment; bioenergy from agricultural, forest, and urban resources; and bioenergy combustion technology. There were papers addressing the production of liquid fuels from biomass, bioenergy from refuse-derived waste, bioenergy project financing, recycling and recovery in bioenergy applications, short rotation intensive culture for energy wood, energy conservation practices, environmental regulation in bioenergy production, air and water management for bioenergy development, and bioenergy case studies, among many.

The Development and Applications Session yielded presentations on state-funded biofuels projects in Alabama, Michigan, Kansas, Alaska, and Hawaii; cogeneration feasibility in West Virginia and Montana; and bioenergy market dynamics in California. The session on bioenergy and the environment covered topics such as waste stream reduction methods, landfill and landfill gas development, wood ash utilization, and wastewater renovation in biomass plantations. The Environmental Protection Agency presented a comprehensive overview of the impacts of the Clean Air Act and the Clean Water Act on bioenergy applications. Densified biomass fuel (pellet) technology and combustion of refuse-derived materials such as mixed wastepaper were the focus of the Bioenergy Combustion Technology Session.

The Technical Forum Session or poster session allowed bioenergy experts from the public and private sectors to provide information transfer of technical state-of-the-art research and development results in an informal atmosphere. The session featured new developments in the areas of fluid-bed combustion of refuse-derived waste, ethanol production from sweet sorghum, commercial land application of wood ash, measurement of emissions from biomass combustions, wood-fired steam generation for space heating, and log yard waste classification.

Produced and co-sponsored by the Forest Products Department of the college, the Bonneville Power Administration, and the Idaho Department of Water Resources, the conference was funded by the Pacific Northwest and Alaska Regional Bioenergy Program, and was held in conjunc-



Damian Sedney

Now reduced to show competition, the once-common springboard chopping technique involved cutting into the bottom of a tapered tree trunk, inserting a board to stand on, making another cut higher up, placing another board in the cut, and standing on this last at 10-12 feet above ground to cut the tree through. The chopper: Earl Marcellus, contract logger and owner of International Lumberjack Shows.

tion with a national meeting of state energy coordinators.

We concluded the event with a full-day field tour of the numerous bioenergy projects in Idaho and Washington, including fluid-bed combustion operations, wood pellet manufacturing, and power generation from wood biomass.

The beneficial role of renewable biomass fuels in coping with global warming and other environmental consequences of fossil fuels have been greatly underestimated and overlooked. Clean bioenergy could be a valuable technology for easing the developed world's solid waste disposal problems, reducing U.S. fuel imports, and replacing these dirty fuels. Above all, it is renewable. We hope this conference will have played an important role in setting the nation's energy agenda through the 1990s.

Conference organizers were Richard L. Folk, instructor, and Leonard R. Johnson, professor and department head, both in the Department of Forest Products. The publication Small-Scale Bioenergy Alternatives for Industry, Farm, and Institutions: A User's Perspective, Proceedings of the National Bioenergy Conference (1991), Richard Folk, ed., Department of Forest Products, College of Forestry, Wildlife and Range Sciences, University of Idaho, is available through the Department of Forest Products.

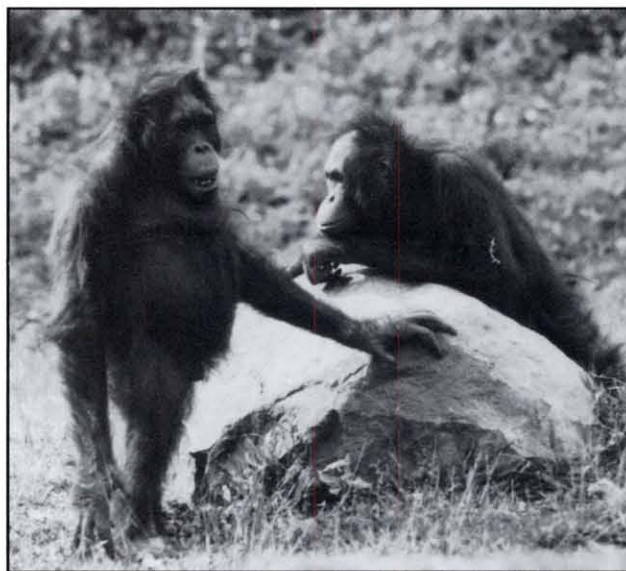
Rice, Elephants, and the American Way—Training Program for Southeast Asia Wildlife Preserve Managers

Ernest D. Ables

The contrasts between protected area problems and management in the U.S. and the developing world are striking. I recall a conversation while sitting on a bench overlooking the Grand Canyon during a field trip I made with four Asian students in my Training Program for Southeast Asia Wildlife Preserve Managers course of 1990. The parking lot was crowded with Winnebagos, Mercedes tour buses from Germany, and station wagons packed to their roofs. "Ven" from Laos told how in his country, visitors tour national parks on elephantback. "Gem" and "Karma" from the tiny Nepal-and India-rimmed country of Bhutan noted that their parks and preserves lack road systems even for protection and service, to say nothing of tourists. Adam from the Philippines argued during the entire trip that protected areas should not be set up for tourists, and pointed out every case of abuse of the natural setting that he could detect.

In contrast to what most Asian managers are used to, our state and national parks maintain extensive road systems and tourist services that rival those of a modern city. Outdoor recreation American-style is built around the automobile and its variations. On the other hand, protected areas in the developing world are set aside first to protect the resource, with frequently little or no consideration given to accommodating visitors. This difference is one of the most striking that our course participants pointed out as they confronted the philosophical difficulties of trying to apply our system's rules to their very different priorities back home.

These guest foresters were part of a course offered for the first time in the summer of 1990 by the college in cooperation with the Office of International Trade and Development, a course that resulted from my visit to China, Thailand, Burma, Indonesia and Malaysia three years before. Intending to identify the training needs of protected area managers in southeast Asia, I and wildlife Professor Oz Garton had observed and spoken with local manage-



Ernest Ables

Monkey business is only part of the varied responsibilities wildlife preserve managers shoulder in southeast Asia—resources, animals, and priorities vastly different from those in the U.S. Above, orangutans relax in a zoological garden near Jakarta, Indonesia.

ment personnel throughout the wildlife preserves, national parks, research stations, and zoological parks of these Asian countries. Upon our return, we designed a 6-week training program that we hoped would address some of the most critical needs for nature preserve management in southeast Asia.

In designing the program, our premise was this: assessment of how well a protected area is achieving its intended purpose depends on knowledge of any changes in distribution and abundance of its plant and animal components. Furthermore, protected areas are not inviolate sanctuaries, but are subject to human activities within their boundaries and are influenced by activities on adjacent lands. Their success or failure also depends on the attitudes and reactions of the local peoples. Consequently, knowledge of multiple-use management and ability to communicate the values of protected areas to the local populace is mandatory for a land manager. Knowledge of plant and animal biology and ecological relationships in these countries needed to be strengthened and an ongoing program of research and ecological monitoring implemented. A major obstacle to addressing these needs was a lack properly trained personnel.

From these premises and observations we identified the basic components of the course as follows: student participants would learn our plant and animal inventory and monitoring techniques, field and laboratory research methods, principles and practices for managing wildlife in natural areas, communication and interpretation of wild-

International Highlights

life information and values to the public, and they would be asked to complete individual projects based on the priority needs of their particular home countries.

The entire course covers a 6-week time frame but can be taught in discrete segments either at the University of Idaho or in another country. Although the course uses methods and approaches developed in the United States, it does not promote the blind application of our way of doing things. We coach all participants to analyze every bit of knowledge they gain and every technique as to its applicability to their unique situation, and if not directly applicable, how it can be modified.

These first four students' trips were financed by the World Wildlife Fund. Two of them were the first in natural resources to study outside their country (Bhutan) and neither had ever even traveled internationally before. On August 17, they returned home: Adam Ausan to St. Paul Park in the Philippines where he is park superintendent; Venevon-

ghet to Laos as director of the Forest Research Conservation Project SIDA/IUCN (Swedish International Development Agency/International Union for the Conservation of Nature and Natural Resources); and to Bhutan—Karma Dhendup, forester for the Wildlife Division Headquarters, and Gem Tshering, forester/manager, Manas National Park. And the training did not end with our proud presentation of certificates of completion. Each student left with an idea or plan to implement after his return home.

During the course we had studied inventory methods in the classroom, the laboratory, and the University of Idaho Experimental Forest. We visited 12 national forests, national parks, state parks, state wildlife areas, wildlife refuges, and national recreational areas in Idaho, Montana, Wyoming and Washington, the overall objective being to expose our guests to the major land management systems and categories of protected areas in the western United States.

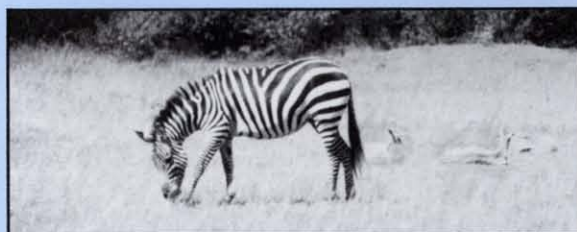
While on our numerous field trips, we camped out in

A Biologist's Dream . . . Linking with Kenya

"It's phenomenal to see the zebras and wildebeests migrating, making the hills black with all their bodies..." relates Edward "Oz" Garton, professor in the Department of Fish and Wildlife Resources who spent 1990 teaching and researching at Moi University in Kenya. "It's a wildlife biologist's dream," continues the Fulbright scholar who had never before visited Africa, "East Africa has the largest and best populations of species, moving and living as they have for eons...."

While stationed at the 1985-established Moi University, Garton taught the only university-level wildlife management classes in east Africa. One of about 160 faculty at the campus built on a former acacia tree farm, Garton taught undergraduate courses in wildlife management, population dynamics, and advanced ecology, and helped faculty there develop a graduate program. He established a "link"—a relationship between the UI College of Forestry, Wildlife and Range Sciences and Moi University, an agreement to cooperate and to share resources at a variety of levels, mostly through the exchange of faculty and of students at the graduate level.

Speaking English, the language of instruction throughout Kenyan schools, Garton taught his 90 students how to use microcomputers, and provided general overviews of the wildlife management discipline through topics ranging from integrated approaches in management to endangered species and ecosystems and even the effects of socio-political systems.



Ernest Ables

Among field trips to several parks, reserves, and mountain ranges was a three-week excursion that included a week on the coast diving to observe marine species.

Interestingly, at 7000 feet and right on the equator, Kenya is very much like the Palouse, reports Garton, with rolling hills and wheat, corn, and vegetable farms, except that in the Palouse one does not find some of the world's largest free-roaming herds of wildebeest, buffalo, and zebra. Mountain gorillas live in the mountains to the west and some preserves are home to multiple species of antelope and to black rhino. The dryer northern part of Kenya supports camels, goats, desert elephants, and fairly wide-spread species of gazelle.

With the highest birth rate in the world, Kenya's population of 50 million puts enormous pressure on its wildlife, explained Garton. He sees progressively worsening conflicts between the needs of poor farmers and the needs of wildlife. "The future wildlife biologists I taught will be moving right into the middle of the conflict," he pointed out, "and they have the opportunity to have an enormous impact on what happens."

The first wildlife management specialist to teach in Kenya, Garton will be succeeded at Moi University by UI wildlife graduate Dr. Gary Koehler who for the next three years will conduct research and teach the same courses that Garton taught.

primitive settings with no facilities, in semi-developed campgrounds, in campgrounds with all the amenities that modern tourists expect, and in cabins in Yellowstone National Park. We wanted our students to participate in the whole spectrum of outdoor recreation experiences. Yet would the cultural differences become obstacles to understanding and to the success of the course? My fears were quickly eliminated; these men knew more about camping than I did. The only thing they did not like was the Coleman stove which burned their rice because of uneven heating. An old fashioned fire served their purpose quite nicely.

Did our four asian students enjoy the U.S.? Yes, but not the food. We treated them to what we considered the most popular American foods: pizza, hamburgers, mexican food, and potatoes. But Adam was a finicky eater and steadfastly refused to sample American cuisine. When the others ordered pizza, he ordered spaghetti, when we ate mexican, he ordered fish!

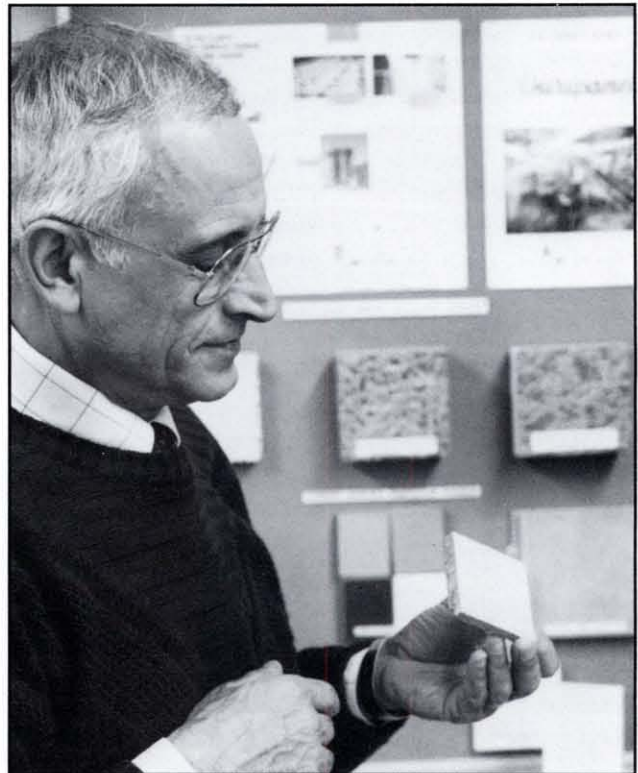
Instead, the meals cooked over an open fire were often the highlight of the day and the trip. We had to leave Yellowstone Park to find a place to build a fire for the evening meal, usually taking up to two hours to prepare, but well worth the wait. The typical meal consisted of rice, curry, grilled fish, and salad. Our discussions about the day's events around the camp fire after an excellent meal will remain my most vivid memory of the course.

World Wildlife Fund has requested that we offer the course again this year. In addition, a natural resources consulting firm in Washington, D.C. under contract to USAID is interested in placing trainees in the program and possibly having us teach the course in Indonesia. All four of our students suggested that the field techniques would be more applicable if taught on site, especially in a tropical forest setting. We hope to see the course continue, and, resources permitting, look forward to doing just that.

Ernest D. Ables is professor of wildlife resources, and associate dean for academics and continuing education. Also founder and training program coordinator for the Training Program for Southeast Asia Wildlife Preserve Managers, he was assisted in the design and teaching of the course by Edward "Oz" Garton, professor of wildlife, Sam H. Ham, professor in the Department of Resource Recreation and Tourism, Nick Saryal, research associate in resource recreation and tourism, and graduate instructors Tim Tear and Jim McCracken in wildlife, and John Carlson in fisheries.

Emerging Opportunities in Mineral-Bonded Wood Composites

Editor, with A.A. Moslemi



Gerry Snyder

Conference organizer A.A. Moslemi.

What's hard, strong, fire-resistant, weather-resistant, sometimes even soundproof, and is made with recycled fibers, minerals, and newspapers? What are 13 factories built in 10 countries over the last decade producing that might help save the environment and create jobs in a whole new industry?

"Wood and fiber composites" are products like plywood and particleboard—various types of wood and non-wood materials bonded together. Recycled wood fiber bonds with materials like cement and gypsum to create entirely new materials that can replace wood and, in some cases, perform better than wood. There are organic composites and "inorganic" composites, the latter so named because they contain no petroleum chemicals (and are thus less likely to burn).

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The 2nd International Inorganic Bonded Wood and Fiber Composite Materials Conference brought some 200 experts from 24 industrial nations to the UI October 14-17, 1990 to showcase the growing technologies of particleboards and fiberboards bonded with mineral binders. Because these technologies are just emerging, the conference provided a wealth of information not yet commonly available. Twenty-eight guest speakers addressed the major issues and advantages of the new composites technology, including performance, flexibility, strength, and recycling characteristics of fiber composites, solutions to some of the problems associated with bonding, and marketing potential.

Several experts testified to the performance attributes of fiber composites, and to their flexibility and strength. Cement-bonded particleboard can be laminated with plastic and metal overlays, and a wide variety of wood veneers. Face bricks and tiles can also be applied. Gypsum-bonded fiberboard, commented one European marketing specialist, is the first board to challenge conventional wallboard in over 70 years. Fiberboard bonded with gypsum is also timely, he added, because users want more performance from the products they buy at a time when consumers are more environmentally aware. The vice president for marketing and development at Highland American of Rhode Island pointed out that gypsum-bonded fiberboard deadens sound better than conventional wallboard, has better nail- and screw-holding properties, and is more mold and mildew resistant. A Clemson University researcher observed that laminating board with polystyrene substantially enhances its insulation characteristics as well.

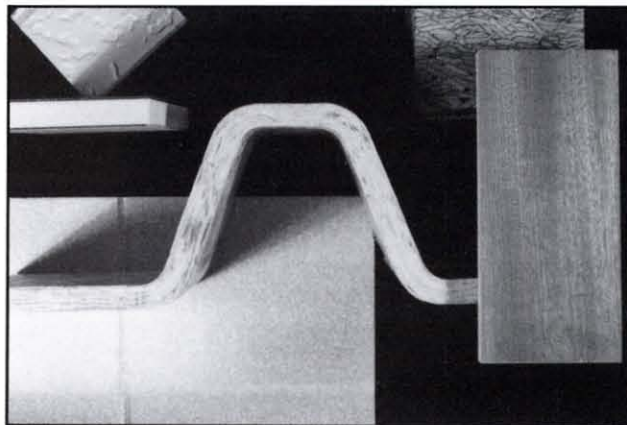
In another presentation, a specialist from the National Science Foundation's Science and Technology Center for Advanced Materials noted that flexible cement-based materials using fibers have now been developed that are not only strong, but can be formed into intricate shapes. The use of wood and plant fibers, he reported, substantially increases the strength of the material to behave elastically over a large stress area. In addition, manufacturers in Japan have now succeeded in producing gypsum fiberboard that, when treated with additives, works well for curved arches and shaped wall surfaces.

Obviously a large part of the flexibility of composites is their strength. A representative of the British Building Research Establishment presented the latest information from Europe on the long-term performance of cement-bonded particleboards. His tests showed increases in the boards' strength under constant environmental conditions due to the slow but continuous hardening of the cement matrix (with strength and stiffness increasing for at least the first three years). He also found the cement-bonded particleboards to be highly resistant to attack both by wood-destroying fungi and by the European subterranean termite.

Even the rate of deterioration of *uncoated* boards appeared to be very slow, thus the prospects of obtaining satisfactory long-term performance look good.

To add to the flexibility and strength of composites, there are the recycling possibilities. Gypsum and cement-bonded composites offer much hope for the world's waste management problems. Indeed, recycled fibers may function better in composites than virgin fibers due to a lower level of compounds normally present in wood that retard bonding. One example of the use of recycled fibers in composites technology is the German-built plant in Nova Scotia which utilizes natural gypsum and recycled newspapers. Another German company, Wurtex, has built a gypsum fiberboard plant in East Providence, Rhode Island, to be operated by Highland American. The plant will use some 84 million newspapers each year in its production, thereby avoiding landfilling this material. In another example of the recycling potential of fiber composites, conference speakers noted that gypsum-fiberboard technology could utilize the substantial quantities of undesirable flue-gas gypsum produced by U.S. power plants, quantities the power plants will be held responsible for under the new U.S. Clean Air Act.

Another raw material speakers put forth as suitable for making fiber composites was hardwoods for cement-bonded particleboard manufacture. Over the years, many hardwoods have proven resistant to bonding with cement to create cement-bonded particleboards, but a Pennsylvania State University scientist detailed his discoveries about which hardwoods develop good bonds with cement and which others require treatment prior to mixing with cement. His samples of hardwood successfully bonded with cement included red oak, hard maple, aspen, and red maple. Now with fast-setting cement-bonded particleboard technology



Wood and fiber composites can be made in practically any shape, size, color, or strength. Above: cement-bonded particleboard tiles for moisture areas like bathrooms; boards used as siding; wall panels veneered for bank or church walls; and formica-coated tiles for counter tops and cabinets.

Gerry Snyder

International Highlights

that uses carbon dioxide injection, practically any wood species can be effectively utilized.

The problem of setting time has long troubled the technology of fiber composites. The conference allowed German and Japanese experts to share their successful methods for dealing with the problem of setting time in cement particle and fiberboards. Representatives of companies in Finland and Hungary revealed how a new plant in Hungary is using carbon dioxide gas injection during the pressing operation to increase bonding while decreasing setting time, producing a wide range of boards with excellent thickness tolerance.

The fast-setting cement particle and fiberboard technology is a promising one, offering considerable potential for a variety of products from siding to roof tiles. In the area of marketing potential, a representative of American Cemwood in Albany, Oregon, explained his company's approach to marketing its roofing products, among them, cement-bonded particleboard roof tiles. The many attributes of the product are important to its success: aesthetics, asbestos-free characteristics, availability, color selection, strength, impact and moisture resistance, and fire rating, among others. He cited fear of fire as the greatest motivation in California thus far for finding alternative products to the conventional cedar shake roof.

Participants saw much promise for the cement-bonded particleboards market in both Europe and the U.S. due to the excellent and very practical properties of the product. Also, according to one speaker working as a consultant in the U.S. and Britain, changes in construction technology and environmental concerns coupled with health concerns

associated with asbestos have resulted in a considerable increase in the use of cement-bonded particleboard in Europe and the Soviet Union.

Over the last decade, the Soviet Union has become the largest producer of cement-bonded particleboard, with fifteen plants currently in operation throughout the country. For the first time, the conference featured a speaker from that country—Yan Tsypin, chief engineer for cement-bonded particleboard operations in the Soviet Union. Tsypin explained that cement-bonded particleboard is used for a variety of structural applications in the USSR, including the inside and outside elements of flat buildings; sheathing for sanitary facilities, bathrooms, and toilets; wall coverings for office buildings and homes; basement ceilings; fireproof doors; fan casings; window sills; and balconies. Tsypin said that manufacturers in his country use both hardwoods and softwoods, including fir, spruce, birch, and aspen.

Participant response to this opportunity to transfer new knowledge and techniques across international lines has been so positive that the conference is now a regular bi-annual event. The next conference is scheduled for October 4-7, 1992.

A. A. Moslemi is professor of forest products and director of graduate programs in the college. As founder of the conference and 1990 conference chairman, he coordinated the event's four sessions, which included, in addition to topics described in the article, one on related technologies and another on worldwide business and marketing opportunities. Sponsors for the conference were: the University of Idaho, the Forest Products Research Society, the International Cement Bonded Particleboard Federation, and the U.S. Department of Agriculture.

Crossing the Border of Understanding: Environmental Education in Latin America, *An Interview with Sam Ham*

Editor

Five years ago Professor Sam Ham sat down to write a personal plan for a career that he hoped would be intellectually stimulating and interesting, and would assimilate his career emphases—natural resource communications and tropical resource management. One job that incorporates these is environmental education in Latin American countries. Fearing mostly the idea of teaching in Spanish, he visited Ecuador and Honduras to “see if it was for me and I was for it,” he recalls . . . It’s been for him ever since.

What is it that you do in Latin America as a natural resources professional, and who is it that asks you to come?

Often the phone at my desk rings. “Señor Ham? Me llamo _____. Trabajo en el Ministerio de Recursos Naturales en Quito, Ecuador . . .” Usually it is a representative of one or another Latin American or Caribbean country, or it is the U.S. Agency for International Development (USAID), World Wildlife Fund, Organization of American States, or a tropical resources consulting firm. They want me to train extension specialists, teachers, tour guides, or lead a planning exercise, and they are willing to pay well. Yet out of the 20 or 30 such calls I receive each year, I say “no” to all but three or four. In a professor’s schedule, there simply isn’t time to do them all. Guatemala must develop an action plan for farm-based environmental education. Ecuador needs technical assistance developing trails in a national park. El Salvador wants museum exhibits. There is incredible demand for U.S. educators in environmental and natural resource fields, but too few of us available and willing to work in developing countries. And believe me, there is also incredible need.

What needs are there in Latin America for U.S. natural resource educators?

In some places, 95 percent of the productive land is owned by a tiny wealthy elite, leaving the peasant majority no choice other than migratory agriculture. Without title to the land, peasant farmers have no incentive to maintain

or improve the land’s productive capacity through soil conservation, crop rotation, or agroforestry. It is simply easier if they clear a section of forest, plant it, get what they can get from the land for five years or so, and then clear a new section of the forest and repeat the process. In addition, when these tropical forests disappear, they take with them plants and animals still awaiting discovery by science, creatures that may hold the key to curing AIDS or the common cold. Some countries maintain unsustainable timber harvest levels to meet the unrealistic export quotas that their nation’s massive foreign debts dictate . . . They are clear-cutting to grow tobacco or coffee for profit rather than food in a nation whose population doubles every 20 years! These problems are partially correctable through education, but until then, whole ecosystems are disappearing, and a lot of people are suffering. Time is running short for some of the countries I work in.



Gustavo Hinojosa

The scientist in the field: in this case, an Ecuadorian “warming shelter” at 15,000 feet elevation to acclimate foreign climbers before they attempt the rest of the mountain. Here, Sam Ham poses with the caretaker and his son who live at the shelter just 15 miles from town—a four-wheel-drive journey so steep it takes four hours to complete.

Understanding . . . ¿Entiende?

Nicknamed "el chinito" (the little Chinese man) by his Latin American colleagues because his name pronounced in Spanish sounded like Chinese to them, Sam Ham achieved a rare acceptance among the Latin American people with whom he worked—the students, agency representatives, university officials, and general populace. This acceptance was hard-earned: Ham reports that he had to re-learn and un-learn much of what he, like so many North Americans, took for granted about Latin America. For example, he noted, not all Latin American people enjoy very hot and spicy food, in fact, there's a saying about the food in Costa Rica: North Americans are advised to bring their own salt and pepper because they may find the food somewhat bland! Ham found music, dances, customs, and especially languages to be very different among the different Latin American countries.

Thus to reach his Latin American students, he needed to learn a whole new way of looking at the world and education, a Latin American way: "We were each other's professors," Ham recounts. "I had no idea just how stupid I was, and even after five years, I'm overwhelmed by what I still have to learn." He goes on, "But what I'm getting in return is a much richer life."

Besides his teaching load here in the U.S., Ham offered courses in Guatemala, Costa Rica, Honduras, and Ecuador during 1990, on topics like "Environmental Education Planning in Sustainable Agriculture," "Interpretive Methods for Extension Specialists," "Environmental Education for Rehabilitating the Rio Segundo," and "Parques y Gente" (Parks and People), among others. His sponsors have included the U.S. Agency for International Development (USAID); La



Zahma Mendoza de Ricord

Universidad Nacional de Costa Rica, Facultad de Ciencias Exactas y Naturales; the U.S. Peace Corps; and a number of private firms. In February 1990 his courses (which he conducts in Spanish) included a two-day environmental education workshop in Costa Rica for children in the 4th through 6th grades.

This year, Ham intends to teach at least three more courses in Spanish—on interpretation for Ecuadoran employees of Galapagos National Park (at the Smithsonian Institution in Washington, D.C.); on interpretive methods for national park managers and staff at Cotopaxi National Park in Ecuador; and on communication methods in Honduras for Peace Corps volunteers and their Honduran counterparts.

Finally, Ham relates a story which he describes as probably his greatest moment of 13 years in higher education. He was at a post-course fiesta after a workshop in the Galapagos, one of the more difficult courses for him because participants came from not just one country, but from all over Latin America and the Caribbean. Seemingly out of nowhere, a Guatemalan colleague pointed to Ham and said, "I have to tell you" beginning a compliment almost never given by Latin Americans in the presence of other Latins, "one of the most frustrating things about Americans is that they don't understand us . . . You're the first American I can believe when you stand up and say something because you *understand me* . . . It gives me hope to know a gringo who understands . . . [gringo is not used as derogatory term]." Ham has described this event as the most significant for him in five years of teaching in Latin America. "It's more than caring about the environment, more than feeling like I'm competent in what I do" he admitted, "it meant I had finally cracked the threshold of understanding . . ." one of the biggest obstacles he found there. "I don't feel like I'm anything special," he reflects. "I feel like I'm really lucky."

How can the university help?

U.S. universities can contribute in three important ways toward solving some of these problems. One, we can take our outreach and education programs to Latin America. Two, we can *appropriately* educate the Latin American students who come to us here at the university. And three, we can give our U.S. students the ability to think outside their own culture and technology, especially if they will be the future resource educators, land managers, and technicians who may someday work outside the U.S., training others about the most successful methods for conserving the ecosystems of an interdependent world. Of course each of these facets presents its own challenges, but none of them is too great to overcome—not for a university committed to making a difference.

. . . When it comes to taking our outreach and education programs to Latin America, I found the biggest challenge of all to be breaking negative stereotypes about North

Americans and earning the trust of my colleagues in the countries I worked in. This is something I continue to strive for even to this day, even after years of teaching in Latin America. This approach is something that every natural resource teacher and professional visiting Latin America needs to master if he or she is to penetrate the guarded borders of Latin America: to overcome the close-minded "ours is better" Ugly American reputation and the understandable resistance to U.S. ideas about natural resource management—nobody likes to be criticized by an outsider.

. . . What we and our students need to learn is this: we all carry psychological baggage with us, biases we need to work past if we are to help the people and environment of Latin America. Both sides need to admit their biases. Only then will our southern neighbors admit us to their hearts, policies, and classrooms.

What is it like teaching in Latin America? What advice would you give a natural resource educator considering

work there?

One of the best pieces of advice I can give is to strive for understanding and tolerance. Environmental education in Latin American countries is a perfect example of how much more there is to the job of an international natural resource professional than just setting up workshops, grading papers, or learning Spanish.

Five years ago I entered El Salvador flanked by armed escorts, assured repeatedly by the U.S. government that I would be safe (which I was), and versed little in Spanish beyond the high school level. Had I elected for full-time protection because of the new rebel offensive then taking place in the capital, I would have taught in a classroom with Uzi-packing guards standing in the back, and returned home each night to a hotel patrolled by private police.

. . . But the thing that struck me most about the course was that my students were so dedicated and eager for knowledge despite their daily reality: a civil war they had been living with for nine years, lack of adequate housing, daily uncertainty about basics like food and family health. Yet there they were, in my class on interpretive methods. I don't mean to make El Salvador nor any Latin American country sound like a disaster area, but the people there do face hardships about things that we take completely for granted in the U.S.

In some of my courses, I taught adults whose children were suffering from malnutrition or dying from diarrhea—the leading cause of death due to water contamination and lack of basic hygiene. Yet despite these hardships, the people always seem happy, kind, and they want the help that someone like I and our natural resources students can offer. And that's the bottom line in international natural resources jobs today.

On your second point—about university professors educating Latin American students appropriately here at the university, why do you use the term “appropriately”?

My point is about understanding and applicability. For one thing, Latin American students studying at an American university provide an especially challenging student profile. They are often highly motivated yet sometimes too eager to find “quick fixes” for the immense natural resource problems they face at home. As a result, they sometimes too readily accept concepts and ideologies which do not fit the situations at home. On the other hand, there are a lot of usable ideas in the U.S. and all over the world that prove valuable if adapted to local needs and conditions. International students and their professors need to sample ideas and together arrive at conclusions about their suitability and feasibility in the student's country . . . We must

remember that our international students are very astute: if we teach them how to solve problems, most will arrive at their own solutions to the problems they face at home.

In this context then, what would be appropriate education for U.S. natural resource students?

Our U.S. natural resource students are another factor in this principle of applicability. We have to impact not only their forestry knowledge, but their attitudes as well, for the world's environmental dilemmas require not only well-trained foresters, but open-minded *people*, willing to work with other people to solve those problems.

Will they do it?

I think they will. About two years ago, after weeks of textbook lessons, I brought in to my sophomore class “Principles of Wildland Recreation Management” a videotape I had of a roundtable held in Quito, Ecuador, and made up of six nations' representatives discussing natural resource issues. My students were shocked. They watched as resource management experts, presidents of billion-dollar corporations, leaders of conservation and indigenous peoples' organizations discussed the economic, social, and environmental trade-offs of tourism development in Ecuador's Amazon Basin. At their request, I showed tapes for three days

Ideas, Budgets, and Soda Crackers

This year may see the publication of a book resulting from Sam Ham's last five years teaching in Latin America: *Interpretation in Natural Resources, Agriculture, and the Environment—A Practical Guide for People with Big Ideas and Small Budgets*. “Basically it's a book about communication,” he remarked. To be printed first in a Spanish edition and then in English, the text covers not only basic interpretation concepts, but also information on developing exhibits, trails, brochures, audiovisual programs, photographs, and on preventative maintenance of equipment and materials. For example, Ham reveals how baking soda or saltine crackers can be used to absorb moisture, preventing damage to slides. In addition, the book includes a section on “Overcoming Barriers to Environmental Education,” and an appendix of key organizations for guiding Latin American readers to local information sources and technical assistance. Ham's book will be prepared in the Publications/Information Services Department of the college and published by North American Press out of Boulder, Colorado. Already, he has received 2,000 requests for the Spanish edition, and expects that number to reach about 5,000. In addition, the now-fluent scientist is currently writing a Spanish dictionary of technical natural resource communication terms.

of my experiences as an environmental forestry teacher in Latin America, and ended by slanting the whole course segment around those experiences. Many students commented later that this part was the best segment of the course for them, and for some—the most applicable course they had had in the university.

. . . The Colleges of Forestry and Agriculture here at the UI have been teaching abroad for over two decades, and as a result, we seem to be developing more sensitivity toward the need to give foreign resource managers techniques appropriate to their part of the world, and toward treating our students in other lands with respect for *their* perspectives. I think we have come to do this better than most other universities. As an added benefit, we are supplying our U.S. students with a less biased, more realistic view of the world system they will increasingly be dealing with after they graduate. Their open, understanding, and tolerant attitudes, coupled with forestry knowledge based on applicability, will make them successful wherever they go to work. No need for me to point out that their success with their counterparts throughout the world means success for the earth as a whole.

And what do you get out of this?

As for myself, I know I am a much better teacher because of my international experience. I have a feeling like what I'm doing *means* something: there's no feeling like knowing that your career is actually important in the lives of real people. I believe there are others too, including many of our students, who would like to feel this way, who would like to make a difference in natural resource management and attitudes throughout the world, who might like to know for example, as I do now, that there are forests in Trinidad that will not burn this year, or fewer Indians in Guatemala who will unknowingly ingest deadly pesticides—because of what I taught them.

Sam Ham is a professor in the Department of Resource Recreation and Tourism.

UI/Honduras Forestry Field Training Course

Charles T. Stiff

*I*n charge of extension and promotion in El Zapote, Santos is responsible for training the public in various aspects of forest management.

An aspiring consultant to the forest industry, Luis has worked 13 years as a forest supervisor.

Norma hopes to earn a master's degree in watershed management, and is currently involved with forest protection in the broadleaf forests near Choloma.

Since 1986, the college has provided an annual 8-week forestry refresher course for Honduran foresters, administered by the Consortium for International Development (based in Arlington, Virginia), and funded by the USAID Mission to Honduras (U.S. Agency for International Development) and the COHDEFOR/USAID Forestry Development Project. Based in Tegucigalpa, Honduras, COHDEFOR in English means The Honduran Forestry Development Corporation. The Forestry Development Project is directed by Mateo Molina, 1986 graduate of the UI with a master's degree in forest management. The 1990 UI/Honduras Forestry Field Training Course took place August 1—September 26.

With 16 years of forestry experience, Noe would like to work in other countries and eventually earn a master's degree. Samuel currently conducts biophysical and socio-economic analyses of municipal micro basins, and would like to study subjects related to water quality.

Our course objectives are to develop participants' knowledge and skills through four weeks of forestry inventory followed by four weeks of forest management and silviculture. The training emphasizes "hands-on" field work—learning by doing, especially skills applicable to Honduran settings. In fact, fifty percent of the training activities takes place in the field: on federal, state, and private industrial forest lands in northern Idaho (including Bennett Lumber Company lands locally), and on the university's 7300-acre experimental forest. Located about 13 miles from Moscow, the university forest offers participants an outdoor laboratory for studying and practicing all aspects of forest management.

Antonio expects to learn about methods of sales for standing timber and their administration to better manage the forests of his country.

The four weeks of training in timber inventory consist of practicing with fixed- and variable-radius plots, alterna-

International Highlights



Jose Aguilar (left) and Noe Polanco plot the layout of roads to be constructed in the East Hatter Creek Unit, UI Experimental Forest.

Robert Barkley

tive sampling procedures, aerial photo interpretation, and forest inventories for timber sales. Four weeks of forest management and silviculture include developing management plans, silvicultural treatments, and logging plans; setting up timber sales; plotting road layout; managing forest harvest; and working to minimize the adverse effects of logging operations.

Oscar, whose experience includes a 1987 solar wood drying project, is a forest extensionist responsible for broad-leaf forests near La Ceiba.

Participants worked in four 3-person crews during exercises on the experimental forest in roading, logging, regeneration survey, timber sale preparation, and management plan preparation. Each crew also included a Spanish-speaking instructor or instructional assistant in the field at all times to evaluate work and to answer questions.

The training staff was made up of Course Coordinator and Principal Instructor Charles T. Stiff, seven other instructors, five graduate instructional assistants (all fluent in Spanish), one administrative support person, and an instructional coordinator—Ing. D. Noe Perez of COHDEFOR. Ing. Perez's participation offered a Honduran perspective to all training activities. To add to this, the experience he received from his participation will be invaluable to him as he establishes in-service training programs of this type in Honduras.

Jorge plans to attend the UI for a master's degree in forest mensuration. Juan intends to earn a master's degree in agroforestry so he can "offer more" to his country.

All the ten men and two women participants in the 1990 training course held Forest Engineering degrees from the Universidad Nacional Autonoma de Honduras in La Cei-

ba, Honduras, and all were employed by the Honduran Forestry Development Corporation (COHDEFOR). To prepare them before they arrived in Idaho, Course Coordinator Charles Stiff conducted an orientation session for participants in May at ESNACIFOR (the National School of Forest Sciences) in Siguatepeque, Honduras.

In addition to enhancing her experience inventorying, inspecting, administering, and managing all aspects of the Comayagua forest district, Carmen wants to learn to speak and write English well.

Miscellaneous activities in the evenings and on weekends offered participants a better understanding of the forest industry, government, and other social and cultural activities in northern Idaho. Evening activities included presentations and tours by: Kenneth Lawrence, director of the UI Office for International Trade and Development, speaking on international graduate study at the UI; Clint Rand, conservation officer, describing his work for the Idaho Fish and Game Department; David Cameron, chief of police, explaining the function of the Moscow Police Department and other law enforcement agencies in the U.S.; Craig Mosman, U.S. district attorney, discussing the legal system in both Idaho and the U.S.; Kenneth Houska, USDA Soil Conservation Service, outlining the agency's mission and his job responsibilities; Paul Agidius, major of Moscow, reviewing local government operations in the U.S.; Philip Gatlin, chief of the Moscow Volunteer Fire Department, describing how his department operates; and Associate Extension Professor Harold Osborne and other members of the Potlatch Lion's Club participating in a monthly club meeting and dinner.

A teacher of introductory forestry classes and head of

International Highlights

a state forest nursery, Jose A. seeks knowledge about new techniques in planting systems and management of wildlife and parks, and intends to put to use in Honduras "everything" he learns in the course.

Weekend activities included a field trip to Kamiak Butte County Park (in Washington state); a three-day silvicultural field trip featuring a tour of the USDA Priest River Experimental Forest; a field tour of forestry operations and practices on the Spokane Indian Reservation led by Ted Hensold, former Peace Corps volunteer in Guatemala and 1988 graduate of the UI with a master's in forest management; a tour of the Dworkshak National Fish Hatchery and Dam in Orofino; and a picnic at the Flat Creek Cabin on the university's experimental forest.

After eight intensive weeks, the course ended with a banquet at the rustic Log Inn in Potlatch as participants, instructors, and instructional assistants all celebrated the presentation of certificates of completion to each guest forester.

. . . Jose Adolfo would like to expand forestry technical knowledge in his own country, and possibly internationally as well . . .

Charles T. Stiff is assistant professor of forest resources and course coordinator/principal instructor of the UI/Honduras Forestry Field Training Course. The other seven instructors were: Harold L. Osborne, associate extension professor (forest resources) and manager of the UI Experimental Forest; Ross Appelgren, assistant manager/logging superintendent of the UI Experimental Forest; Karl J. Stoszek, professor, forest resources; Sam H. Ham, associate professor, resource recreation and tourism; Joseph J. Ulliman, professor and head of the Department of Forest Resources; Ted Hensold, forester for the Forestry Branch of the Spokane Agency, Bureau of Indian Affairs, Wellpinit, WA; and Thomas V. Dechert, PhD student in soil sciences and former field director of the UI/ESNACIFOR project Classification of the Upland Pine Forests of Central Honduras for Site Quality and Productivity. The instructional coordinator was Ing. D. Noe Perez, field director for the COHDEFOR/USAID Forestry Development Project in Tegucigalpa, Honduras. The five graduate instructional assistants for the 1990 course were: Mauricio Alcocer-Ruthling, PhD student in plant sciences from Guadalajara, Mexico; Roberto A. Avila, M.S. student in forest resources from Tegucigalpa, Honduras; Robert O. Barkley, Moscow resident, M.S. student in forest resources, and former Peace Corps volunteer in Honduras; Juan de la Garza, M.S. student in fish management from Mexico City, Mexico; and Guillermo A. Navarro, B.S. student in forest resources from San Jose, Costa Rica. Providing administrative support and acting as liaison with the Consortium for International Development was Michael R. Whiteman, foreign student coordinator for the college.

100 Years to Grow, 10 Minutes to Cut Down

"100 years to grow, 10 minutes to cut down" was the motto of participants in the 1990 one-time Bolivian Forestry Training Program, a statement pointing out the contrast between the time it takes a tree to grow to marketable size and the time it takes to cut it down. Describing them as very "environmentally aware and active," Assistant Professor of forest products Harry Lee said the participants intend to use what they learned to set up programs that will heighten environmental awareness in their home country.

Lee, who previously taught in the UI/Honduran Forestry Field Training Course, served as technical director of the "Academic Program"—the six-week UI portion of an eight-week program funded by the Andean Peace Scholarship Project (USAID) through the USDA Graduate School. The graduate school presented the course in cooperation with the UI and the International Economics Group, Inc.

Not as field-oriented as the Honduran course, the Bolivian Forestry Training Program nonetheless attracted many "high-level" participants of a wider range of expertise, according to Lee. The two women and 17 men came to the UI April 1 to May 28, 1990 to acquire the technical training necessary to further development objectives in Bolivia and to gain understanding of the U.S. democratic process. They did so in such varied official positions as field technicians, engineers, biologists, and ecologists. Among the students were a university professor of natural resources and an instructor of ecology, the director of the Center for Forestry Development in Bolivia, chief of the Department of Wildlife Protection, chief of the Department of Watershed Management, and a chief in the Ministry of Agriculture.

Utilizing concepts outlined by the U.S. Clean Water Act of the 1960s and the idea of balance between natural resource conservation and utilization, Lee and instructors from three of the college's five departments dealt with topics of ecological protection, sound forestry management practices, natural resource management (including wildlife), and national park development and management. They covered numerous related topics as well, ranging from natural resources communications and aerial photo interpretation to fire ecology and field observation of effects of different forest harvesting techniques.

In addition, participants enjoyed several field trips. They spent a weekend at the Huckleberry Heaven Lodge at Elk River, visited Elk Creek Falls, experienced some of the countryside of the Clark Fork Field Campus, observed the Nez Perce Tribe Forestry Program, and toured Dworkshak National Fish Hatchery and the Potlatch Ranger District. Lee reports that they were especially impressed with west Yellowstone Park where they stayed at Yellowstone Lodge for the last week of the UI portion of the course. The Forest Products Department Annual Pig Roast at the Harry Lee residence topped off the experience.

From the UI the Bolivians flew to Washington, D.C. for two weeks of leadership training and meetings with international development and environmental conservancy organizations.

The FWR-Portugal Connection: Prescribed Fire in Maritime Pine

Stephen Bunting, Penelope Morgan,
Francisco Rego, and José Moreira da Silva

In 1982 Francisco Rego, a new faculty member at the Universidade Trás-os-Montes e Alto Douro (UTAD) in northern Portugal came to the University of Idaho on a short-term visit to use the college's computer facilities to analyze data for vegetation classification of oak woodlands, and to investigate the possibility of pursuing a doctoral degree in range resources. At the time, his home country was attempting to increase its wood production capability, but found itself limited by recurrent wildfires that yearly burned about one percent of the total Portuguese forest and shrubland, an amount that nearly equals the area the country can reforest annually with nursery-grown trees. Francisco Rego was interested in studying prescribed fire at the UI to more readily address the fire-related problems of his country.

The Portuguese Forest Service had begun to experiment with prescribed fire as a wildfire control by 1980, but were having problems with public and agency acceptance and application of the practice. Accustomed to observing the more destructive nature of fire, they seldom considered it as a potential management tool. But some foresters had seen the potential for fire use in several forest types, particularly maritime pine. Native to southwestern Europe, maritime pine is used extensively for reforestation in Portugal and Spain. It shares many characteristics with ponderosa pine in North America, including a high degree of fire resistance, the ability to self-prune the lower branches, a thick bark that protects the cambium, and long leaves that protect the buds at the ends of the branches. Maritime pine is used extensively for production of resins, saw timber, and pulp in Portugal.

A year after Rego's first visit to Idaho, Steve Bunting met with him in Portugal to establish a program that would serve as his dissertation research, and hopefully would help solve some of the problems in Portugal's maritime pine forests. We thought prescribed fire could be used to reduce wildfire potential and simultaneously increase forage value without significantly reducing the productivity of the trees.

With the cooperation of the Portuguese Forest Service, we selected sites in forest service districts throughout



Penelope Morgan

Occasional prescribed burning of maritime pine—a European cousin of North America's ponderosa pine—results in greater species diversity of the understory and greater nutritional quality of forage in Portuguese forests.

the northern region of the country already experimenting with prescribed burning. Together we investigated (and continue to investigate) the effects of prescribed fire on maritime pine mortality and growth, understory species, forage quality, and soil nutrient levels. To avoid isolating these studies from actual practice in Portuguese forests, we worked with the forest service to incorporate fire into their general management practices.

Francisco Rego and José Moreira da Silva, chief of the Forest Service's northern region, developed a monitoring procedure for fire in that region. In addition, they implemented shortcourses for forest service personnel on prescribed fire planning and application.

Portuguese foresters conducted prescribed burning in six districts, some as part of Rego's research and others strictly for training purposes. As they became more comfortable with the concepts of prescribed burning, we conducted additional shortcourses and prescribed burns to increase their training to the point that they could use burning as a general forest management treatment for reducing fire hazard, managing fuel loads, and increasing livestock forage quality.

By 1988, forest service, park service, and other forest managers in Portugal wanted to extend knowledge about the potential use of fire throughout the entire country. We were part of a five-day shortcourse for forest managers representing all the regions of Portugal. Instructors included research-

International Highlights

ers from UTAD, the Instituto Superior Tecnico in Lisbon, the National Forest Experiment Station, the University of Idaho, and managers from the Portuguese Forest Service.

Since then, the application and research of prescribed fire in Portugal has continued to expand. Interest has increased at other universities in Portugal as well as Rego's home university (UTAD), with studies varying from basic research on the physical aspects of heat flow to applied research on the relationship of bark beetles to fire. For example, Francisco Rego's research has shown that pine mortality is low and reduction in growth acceptably small following fire on most sites. However, pine forests in the warmer coastal areas appear to be more susceptible to pine beetle attack following fire. Other scientists in Portugal have now joined Rego in attempting to understand the relationship of fire to pine bark beetles in this region. Rego and his fellow researchers have also discovered that fire in maritime pine stands in his country results in greater species diversity of the understory and greater nutritional quality of forage. To add to this research, we are currently conducting studies to determine if site productivity can be sustained under a fire regime of 7- to 10-year intervals between

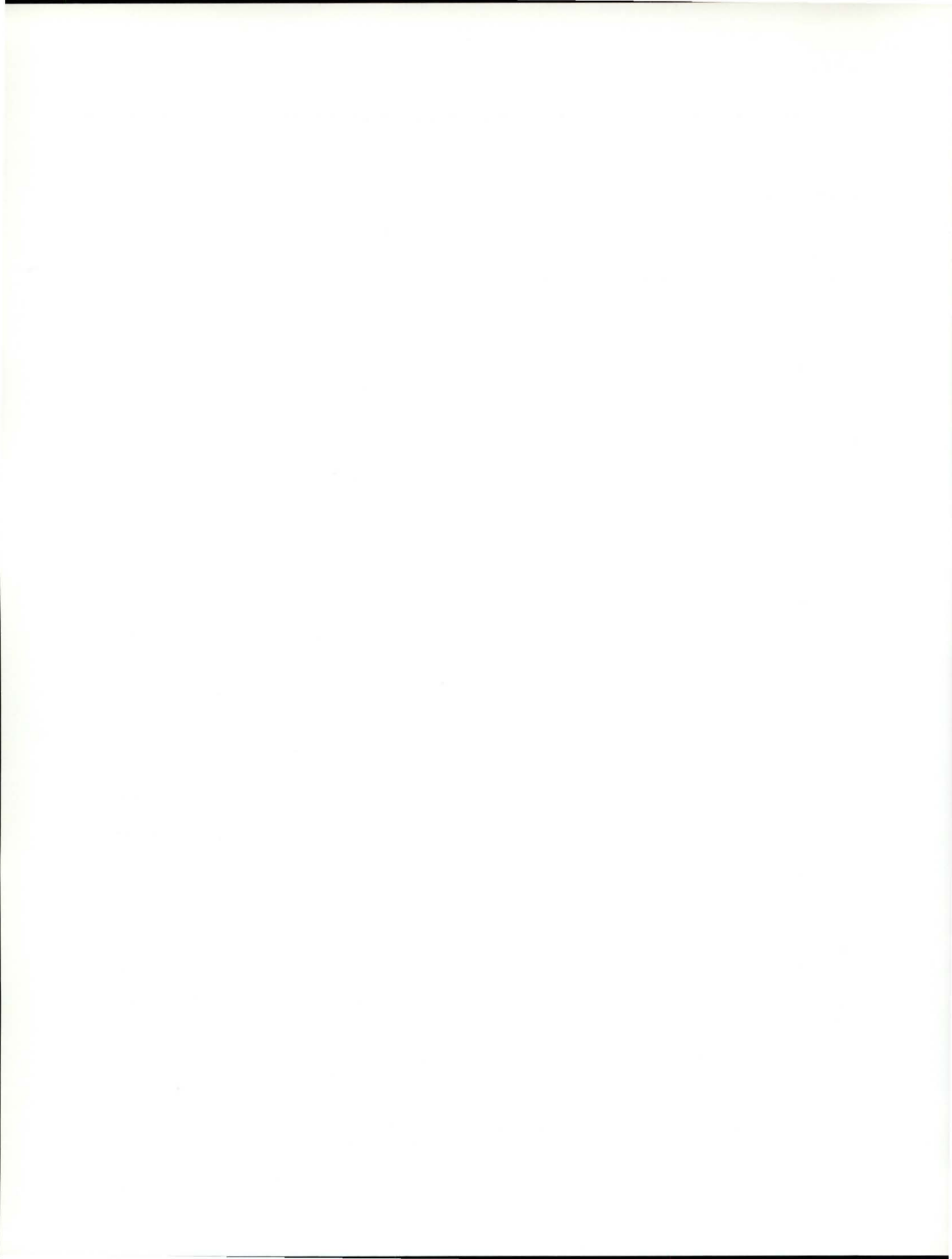
fires. Rego's initial research indicated that this was the optimum interval to reduce fuel loads and maintain understory forage quality.

As a result of the increase in information now available to land managers in Portugal about the ever growing possibilities for fire management in that country, managers are now interested in prescribed fire not only for maritime pine, but also oak and eucalyptus forests and shrublands; recent research has expanded to include these vegetation types. Today, prescribed burning is a more common practice in the management of forests in Portugal, thanks to the cooperative link forged between UTAD, the University of Idaho, and the Portuguese Forest Service.

Stephen C. Bunting is professor of range resources, and Penelope Morgan is associate professor of forest resources. Francisco Rego is currently professor of forestry at the Instituto Superior de Agronomia in Lisbon, and José Moreira da Silva is chief, Circunscriçao Florestal do Porto. Their work and Bunting's and Morgan's initial visits to Portugal with Francisco Rego were partially funded by the U.S. Agency for International Development (USAID), the Luso American Foundation, the Portuguese Forest Service, and the Universidade Trás-os-Montes e Alto Douro.



Penelope Morgan



Experiment Station Scientists

Department of Fish and Wildlife Resources

- Ables, Ernest D.
Professor
Associate Dean for Academics and Continuing Education
Wildlife ecology, especially animal behavior and radiotelemetry techniques
- Acker, Steven A.
Research Associate
Plant ecology of the northwest, ecology of climate change
- Bennett, David H.
Professor
Warmwater fishery management, fish ecology
- Bizeau, Elwood G.
Professor Emeritus
Associate, Wildlife Research Institute
Birds, principally waterfowl and marsh
- Bjornn, Theodore C.
Professor
Assistant Leader, Idaho Cooperative Fish and Wildlife Research Unit
Fish ecology and management
- Brannon, Ernest L.
Professor
Director, Cooperative University of Idaho Aquaculture Program
Fish culture, fish behavior, salmonid life history, sturgeon life history
- Congleton, James L.
Associate Professor
Assistant Leader, Idaho Cooperative Fish and Wildlife Research Unit
Fish immunology, stress physiology
- Csuti, Blair A.
Adjunct Associate Professor, Idaho Cooperative Fish and Wildlife Research Unit
Strategies for the selection and design of nature reserves, endangered species conservation, wildlife/habitat relationships
- Falter, C. Michael
Professor and Department Head
Reservoir limnology, stream ecology, lake management
- Garton, Edward O.
Professor
Acting Director, Wilderness Research Center
Wildlife population biology, systems ecology, census methods, statistical analysis
- Hayward, Gregory D.
Visiting Assistant Professor
Quantitative analysis, wildlife habitat, bird and small mammal response to forest management, forest owl ecology
- Hornocker, Maurice G.
Professor
Director, Wildlife Research Institute
Population ecology, predator-prey interactions
- Hungerford, Kenneth E.
Professor Emeritus
Wildlife management
- Kaiser, Horst
Visiting Scientist
- Keith, Robert M.
Research Associate
Fishery biology, statistical analysis
- Klontz, George W.
Professor
Diseases and rearing problems of aquatic animals, aquaculture
- MacPhee, Craig
Professor Emeritus
Fish behavior, ecology, toxicology
- Moffitt, Christine M.
Adjunct Associate Professor
Research Scientist
Ecology, health, and management of anadromous salmonids; use of therapeutic substances to treat fish diseases
- Nelson, Lewis, Jr.
Extension Professor
Continuing education, communications, wildlife resources
- Peek, James M.
Professor
Big game management, habitat relationships
- Peery, Chris
Research Associate
Adult salmon and steelhead passages at dams
- Ratti, John T.
Adjunct Associate Professor
Research Scientist, Idaho Cooperative Fish and Wildlife Research Unit
Avian ecology; behavioral, evolutionary, and population ecology; habitat analysis
- Reese, Kerry P.
Associate Professor
Wetland, waterfowl, and upland game ecology; nongame ecology
- Riggers, Brian
Scientific Aide
Limnology, river ecology
- Ringe, Rudy R.
Research Associate, Idaho Cooperative Fish and Wildlife Research Unit
Anadromous fish ecology and management
- Rubin, Stephen A.
Research Associate
Salmonid ecology
- Sawle, Wayne (Pete)
Scientific Aide
Stream ecology and fisheries, GIS

Experiment Station Scientists

Scarnecchia, Dennis L.

Associate Professor
Salmon, trout, and paddlefish research; fish populations and community ecology in large rivers

Scott, J. Michael

Professor
Leader, Idaho Cooperative Fish and Wildlife Research Unit
Ecology and management of nongame and endangered species, sampling methods for estimating bird numbers, systems approaches to conservation ecology

Setter, Ann L.

Research Associate
Fish culture, sturgeon life history, electrophoresis

Wright, R. Gerald, Jr.

Professor
Project Leader (Biology), Cooperative Park Studies Unit
Wildlife habitat management, national park wildlife management

Yeo, Jeffrey J.

Adjunct Assistant Professor
Scientist/Field Manager, Taylor Ranch (Wilderness Research Center)
Ungulate habitat and behavior

Lee, Harry W.

Assistant Professor
Harvesting systems, road design, site productivity, soil-water relationships

Moslemi, Ali A.

Professor
Director, Graduate Programs
Wood particle composites, wood technology

O'Laughlin, Jay

Adjunct Professor
Adjunct Professor, Forest Resources
Director, Policy Analysis Group
Forest economics, forest policy, structural changes in wood-based industries

Steinhagen, H. Peter

Associate Professor
Drying of lumber and wood particulates, heat transfer in frozen and nonfrozen wood systems, wood energy, wood preservation

Department of Forest Products

Bottger, Richard F.

Adjunct Associate Professor
Director of Administrative Services
Assistant Director, Idaho Forest, Wildlife and Range Experiment Station
Business and personnel management

Campbell, Alton G.

Associate Professor
Pulp and paper science, waste treatment and resource recovery

Folk, Richard L.

Instructor
Densified wood fuel manufacturing, resource recovery and waste management, continuing education

Gorman, Thomas M.

Assistant Professor
Wood construction and design, physical properties of wood, secondary wood products manufacturing, moisture problems in wood-frame houses

Govett, Robert L.

Associate Professor
Forest products business management, forest products marketing, forest products primary manufacturing and quality control, production feasibility

Johnson, Leonard R.

Professor and Department Head
Timber harvesting systems, wood energy, recovery and processing of forest residues

Adams, David L.

Professor
Silviculture, growth and yield

Appelgren, Ross

Assistant Manager/Logging Superintendent, University of Idaho
Experimental Forest
Logging systems

Belt, George H.

Professor
Forest hydrology and watershed management, social forestry, agroforestry

Brunsfeld, Steven J.

Assistant Professor
Director, Forestry, Wildlife and Range Sciences Research
Herbarium
Vegetation ecology, autecology, systematics, molecular biology of woody plants

Burlison, Vernon H.

Extension Forester Emeritus
Extension Professor Emeritus

Canfield, Elmer R.

Associate Professor Emeritus
Forest pathology

Carree, Yvonne

Forestry Extension Associate
Forestry Extension, hardwood growth and management

Dennis, Brian

Associate Professor
Statistical ecology, biometrics, mathematical modeling

Department of Forest Resources

Experiment Station Scientists

- Deters, Merrill E.
Professor Emeritus
Silviculture
- Dolsen, Dana E.
Research Associate, Cooperative Park Studies Unit
- Dumroese, R. Kasten
Research Associate
Forest nursery technology and production, nursery management
- Edson, John L.
Research Associate, Forest Research Nursery
Vegetative propagation, biotechnology, seedling production
- Fins, Lauren
Professor
Director, Inland Empire Tree Improvement Cooperative
Genetic improvement of forest trees, effects of forest management on genetic resources
- Force, Jo Ellen
Associate Professor
Forest planning and policy, particularly the role of people and other social science aspects; training and international development
- Hatch, Charles R.
Professor
On leave in Islamabad, Pakistan, for Winrock Consulting Agency
Forest mensuration and statistics
- Hendee, John C.
Professor
Professor, Resource Recreation and Tourism
Dean, College of Forestry, Wildlife and Range Sciences
Director, Idaho Forest, Wildlife and Range Experiment Station
Human dimensions of resource management, conflict resolution, resource management policy and planning, use of natural environments for personal growth
- Johnson, Frederic D.
Professor Emeritus
Autecology, synecology, and phytogeography—emphasis on northern Rockies and on forest lands and woody plants, dendrology—temperate and tropical
- Johnson, Leonard R.
Adjunct Professor
Professor and Department Head, Forest Products
Systems and cost analysis of timber harvesting operations, recovery and processing of small timber and forest residue
- Littlejohn, Margaret E.
Western Coordinator, Visitor Services Project
(National Park Service duty stationed in Cooperative Park Studies Unit)
- Loewenstein, Howard
Professor Emeritus
Forest soils and tree nutrition
- Lotan, James E.
Adjunct Professor
Research Scientist
Silviculture and fire management
- Machlis, Gary E.
Professor
Adjunct Professor, Resource Recreation and Tourism
Project Leader (Sociology), Cooperative Park Studies Unit
Sociology of natural resources
- Madison, Dwight
Eastern Coordinator, Visitor Services Project
(National Park Service duty stationed in Cooperative Park Studies Unit)
- Mahler, Robert
Adjunct Associate Professor
Associate Professor, Soil Sciences (Department of Plant, Soil, and Entomological Sciences, College of Agriculture)
Soil fertility, plant nutrition
- Mahoney, Ronald L.
Associate Extension Professor
Extension Forester, Cooperative Extension Service
Silviculture and management of non-industrial private forests, natural resources education for youth
- Marshall, John D.
Assistant Professor
Tree physiology, ecophysiology
- Mattson, Kim G.
Research Assistant Professor
Forest ecology
- McKetta, Charles W.
Associate Professor
Economist, Idaho Forest, Wildlife and Range Experiment Station
Timber investments, forest policy, international forestry, fire and fuel management economics, harvest scheduling, forest taxation, timber supply
- Medema, E. Lee
Associate Professor
Forest economics (investment analysis, stumpage markets, policy, impact assessments)
- Mika, Peter G.
Research Associate
Biometrics, forest nutrition
- Montville, Mark
Assistant, University of Idaho Forest Research Nursery
Seedling quality, reforestation and conservation planting
- Moore, James A.
Professor
Director, Intermountain Forest Tree Nutrition Cooperative
Various aspects of forest growth and yield modeling, mineral nutrition of forest trees, influence of nutritional status on primary forest productivity
- Morgan, Penelope
Associate Professor
Director, Prescribed Burning Program
Fire ecology and management, silviculture and forest ecology, ecological modeling
- Mousseaux, Mark
Seed Specialist, University of Idaho Forest Research Nursery

Experiment Station Scientists

Neuenschwander, Leon F.

Professor
Adjunct Professor, Range Resources
Associate Dean for Research and International Programs
Associate Director, Idaho Forest, Wildlife and Range Experiment Station
Forest and range ecology, fire management, prescribed burning, site preparation for conifer release

O'Laughlin, J.

Adjunct Professor
Adjunct Professor, Forest Products
Director, Policy Analysis Group
Forest economics, forest policy, structural changes in wood-based industries

Osborne, Harold L.

Associate Extension Professor
Manager, University of Idaho Experimental Forest
Silviculture, log scaling and timber cruising, forest resource inventories

Partridge, Arthur D.

Professor
Insect/disease interactions, nursery problems, urban tree problems

Pym, Geneva E.

Research Technician
Quantitative and qualitative analysis

Quick, Ken

Greenhouse Assistant, University of Idaho Forest Research Nursery

Robison, M. Henry

Adjunct Assistant Professor
Assistant Professor, Agricultural Economics (Department of Agricultural Economics and Rural Sociology, College of Agriculture)
Urban and regional economics, natural resources and environmental economics

Rust, Marc

Research Associate
Genetic improvement of forest trees, application of computer technology to forestry

Sanders, Kenneth D.

Adjunct Professor
Professor, Range Resources
Range Extension Specialist
Range extension, nutrition, and livestock; grazing systems

Schenk, John A.

Professor Emeritus
Forest entomology (insect bionomics, silviculture, and biological control)

Seale, Robert H.

Professor Emeritus
Forest economics

Shaw, Terry M.

Research Associate, Intermountain Forest Tree Nutrition Cooperative
Forest resource inventories and data base management, forest nutrition, nutrition/disease interaction

Stark, Ronald W.

Professor Emeritus
Population dynamics and integrated pest management of forest insects

Stiff, Charles T.

Assistant Professor
Growth and yield modeling and simulation, forest sampling and inventory methods, site productivity, international forestry

Stock, Molly W.

Professor
Artificial intelligence/expert systems applications in natural resource management, human-computer interactions, biosystematics and population genetics of forest insects

Stoszek, Karl J.

Professor
Forest protection, silviculture

Ulliman, Joseph J.

Professor and Department Head
Director, Forestry, Wildlife and Range Sciences Remote Sensing Center
Aerial photographic interpretation, remote sensing

Verbyla, David L.

Visiting Assistant Professor
Remote sensing, aerial photography, digital image processing, geographic information systems

Wenny, David L.

Extension Professor
Manager, University of Idaho Forest Research Nursery
Forest nursery technology and production, seedling physiology and quality, forest regeneration

White, Donald R.

Associate Extension Professor
Extension County Chairman, Kootenai County
Extension forestry

Department of Range Resources

Bunting, Stephen C.

Professor
Fire ecology, range ecology, range management

Ehrenreich, John H.

Professor
Agroforestry, range ecology, international forest and range management

Hironaka, Minoru

Professor
Range ecology, rangeland classification, soil-plant relationships, shrub restoration

Johnson, Kendall L.

Professor and Department Head
Shrubland ecology and management, range extension, range nutrition

Experiment Station Scientists

- Kingery, James L.
Assistant Professor
Forest grazing policy and management, rangeland rehabilitation, range management
- Mosley, Jeffrey C.
Assistant Professor
Grazing systems, animal grazing behavior, range livestock nutrition, livestock-wildlife relations
- Neuenschwander, Leon F.
Adjunct Professor
Professor, Forest Resources
Associate Dean for Research and International Programs
Associate Director, Idaho Forest, Wildlife and Range Experiment Station
Forest and range ecology, fire management, prescribed burning, site preparation for conifer release
- Robberecht, Ronald
Associate Professor
On Fulbright Scholar Grant at University of Tromso, Norway
Ecophysiology, autecology, range ecology
- Sanders, Kenneth D.
Professor
Adjunct Professor, Forest Resources
Range Extension Specialist
Range extension, nutrition, and livestock; grazing systems
- Sharp, Lee A.
Professor Emeritus
Integrated range resource management, range management planning, grazing systems
- Tisdale, Edwin W.
Professor Emeritus
Vegetation classification, vegetation habitat relationships

Department of Resource Recreation and Tourism

- Fazio, James R.
Professor
On three-year leave as director of National Arbor Day Foundation Educational Institute in Lincoln, Nebraska
Interpretation, communication, public relations and marketing, conservation history, wilderness use, continuing education
- Ham, Sam H.
Professor
Director, Natural Resources Communication Laboratory
Interpretation; tourism marketing; communication; visitor behavior, especially as it relates to families; international park and preserve management through user education; environmental education, especially in Latin America

- Harris, Charles C.
Associate Professor
Consumer psychology of recreationists/tourists, demand estimation in modeling recreationist/tourist behavior, economic and psychological approaches to measuring the values and benefits derived from recreationist/tourist opportunities and other amenity resources
- Hendee, John C.
Professor
Professor, Forest Resources
Dean, College of Forestry, Wildlife and Range Sciences
Director, Idaho Forest, Wildlife and Range Experiment Station
Human dimensions of resource management, conflict resolution, resource management policy and planning, use of natural environments for potential growth
- Krumpe, Edwin E.
Associate Professor and Acting Department Head
Principal Scientist, UI Wilderness Research Center
Wilderness and dispersed recreation management, monitoring human impacts, recreation and tourism behavior and the decision process, interpretation and communication, administration, facilities management, research methods
- Machlis, Gary E.
Adjunct Professor
Professor, Forest Resources
Project Leader (Sociology), Cooperative Park Studies Unit
Sociology of natural resources
- McLaughlin, William J.
Professor
Regional resource and tourism planning, environmental and social impact assessment, perceptions of environments, public involvement and conflict management, international nature conservation and resource development, research methods
- Sanyal, Nick
Research Associate
Recreation planning, recreation behavior, human dimensions of wildlife management, research methodologies
- Savage, George
Adjunct Associate Professor
Managing Editor and Director, FWR Information Services
Natural resource literature, scientific writing, report preparation, and other aspects of print media communication

Policy Analysis Group (PAG)

- O'Laughlin, Jay
Director
Adjunct Professor, Forest Products
Adjunct Professor, Forest Resources
Forest economics, forest policy, structural changes in wood-based industries
- Wise, Carla
Research Associate
Natural resource policy

Publications and Reports

The following list contains most works published during 1990. Copies of Idaho Forest, Wildlife and Range Experiment Station publications and reprints of some journal articles are available from the authors. Reports issued to fulfill contracts are generally not available for distribution to the public.

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Bennett, D.H. 1990. Use of dredged material to enhance fish habitat in the Lower Snake River, Idaho-Washington. *In* Proceedings on the Beneficial Uses of Dredged Material in the Western United States, San Diego, California.

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Bennett, D.H., C.M. Falter, and A.G. Campbell. 1990. Toxicity evaluation of CTMP effluent biotreated by a pilot-scale carousel system. *In* Proceedings of Special CTMP Conference, Vancouver, British Columbia, Canada.

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Fred Johnson

Research Projects and Investigations

Research Projects and Investigations

This listing shows the range of work in progress through the Idaho Forest, Wildlife and Range Experiment Station. For additional information, please write to the principal investigators or to the Associate Director, Idaho Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow, Idaho 83843.

Department of Fish and Wildlife Resources

- Behavioral interactions between bighorn sheep, mule deer and elk on the winter range. E.D. Ables, H. Akenson
- Ecology of elephants on Nazinga Game Ranch, Burkina Faso. E.D. Ables, E. Damiba
- The Arabian oryx re-introduction: the development of a wild population. E.D. Ables, T. Tear
- Assessing the potential to enhance aquatic habitat with dredged materials in Lower Granite Reservoir. D.H. Bennett
- Fishery and habitat survey of the Pend Oreille River. D.H. Bennett
- Evaluation of habitat and fish populations—Northern Pike. D.H. Bennett
- Evaluation of habitat and fish populations—Clearwater and St. Joe National Forests. D.H. Bennett
- Monitoring fish and community activity at disposal and reference sites in Lower Granite Reservoir. D.H. Bennett
- Distribution, abundance, and life history of northern pike in the Coeur d'Alene Lake System. D.H. Bennett
- Establishing a new population of whooping cranes by utilizing foster parents. R. Drewien, W. Brown, E.G. Bizeau
- Potential to detect genetic differences in cutthroat trout stocks with electrophoresis. T.C. Bjornn
- Evaluation of passage of adult chinook salmon and steelhead at Lower Snake River Dam and Reservoir. T.C. Bjornn, R. Ringe, C. Peery
- Determination of effects of reduced and instantaneous flows on adult fish. T.C. Bjornn
- Response of salmonids to riparian vegetation and instream cover modification in second-growth forest streams of southeast Alaska. T.C. Bjornn, M. Brusven, R.M. Keith, N. Hetrick
- Re-evaluation of status of fish populations in the North Fork and Kelly Creek Drainages in relation to special angling regulations. T.C. Bjornn, J. Hunt
- Spawning behavior of wild and hatchery salmon. T.C. Bjornn, P. Sankovich
- Emigration of newly emerged chinook salmon and steelhead fry and their contribution to returning adult runs. T.C. Bjornn
- Evaluation of supplementation of natural chinook salmon stocks. T.C. Bjornn
- Chinook fry migration. T.C. Bjornn, C. Peery
- Interaction of coho salmon with resident cutthroat trout and Dolly Varden in the Slippery Creek Drainage, Kuiu Island, Alaska. P. Porter, T.C. Bjornn
- Analysis of status and nature of sockeye salmon and kokanee in Stanley Basin lakes. E.L. Brannon
- Study of white sturgeon life history and genetics. E.L. Brannon
- Relationship of salmon populations to conservation efforts. E.L. Brannon
- Control of infectious hemotopoietic necrosis in commercially-reared salmonids. J.L. Congleton
- Occurrence and quantity of infectious hematopoietic necrosis virus in the North Fork Clearwater River and Dworshak National Fish Hatchery. J.L. Congleton, Y. Zhang
- Control of infectious hemotopoietic necrosis virus: antiviral effects of the trout macrophage. J.L. Congleton
- Permissiveness of the rainbow trout macrophage for replication of IHN virus. J.L. Congleton, C. Helmick
- Limnological study of Lake Pend Oreille. C.M. Falter
- Limnology of the Spokane River. C.M. Falter, B. Riggers.
- Pend Oreille River fish, water quality, wildlife, and recreation project. C.M. Falter, D.H. Bennett, K.P. Reese, W.J. McLaughlin
- In-shore productivity of Lake Pend Oreille, Idaho. C.M. Falter, D. Olson.
- Heavy metals loading in fish of Kilarney Lake, Idaho. C.M. Falter, D.H. Bennett
- Evaluation of nest boxes as a tool to monitor boreal owl response to forest management. G.D. Hayward, P.H. Hayward
- Ecological interactions between lichen and small mammal populations. G.D. Hayward, P.H. Hayward
- Population analysis of endangered Hawaiian birds. G.D. Hayward, J.M. Scott, E.O. Garton
- Partnership in forest wildlife management: conserving biological diversity in managed, Rocky Mountain forest ecosystems. G.D. Hayward, E.O. Garton, P. Morgan, K.P. Reese
- Ecology of an unexploited mountain lion population in a desert environment. M.G. Hornocker, K. Logan, L. Sweanor, F. Smith, B. Spreadbury
- Ecology of the mountain lion in the Yellowstone Ecosystem. M.G. Hornocker, K. Murphy, J. Tischendorf
- Population dynamics of coyotes in Yellowstone National Park. R. Crabtree, M.G. Hornocker
- Regulating growth of salmonids in hatcheries. G.W. Klontz
- Marketing potential for trout in Mexico state, Mexico. G.W. Klontz
- FDA-approved registration of erythromycin for treatment of bacterial kidney disease (BKD) in juvenile and adult chinook salmon. C.M. Moffitt, R. Ringe
- Determining the location of moose winter ranges on the Cooper River Delta. J.M. Peek
- Movements and habitat use patterns of elk on or near the Idaho National Engineering Laboratory. J.M. Peek

Research Projects and Investigations

- Movement and habitat use patterns of bighorn sheep. J.M. Peek
- Development of methodology to predict damage on winter wheat and winter rapeseed yields by elk. J.M. Peek, M. Jarmer
- Development of predictive model for Morgan Creek (Idaho) carrying capacity of bighorn sheep (winter-spring range). J.M. Peek, G.L. Ballard
- Analysis of effects of land management activities on the Lochsa elk population. J.M. Peek
- Reproductive ecology of tundra swans on the Arctic National Wildlife Refuge. J.T. Ratti, M.J. Monda
- Intermountain West concept plan (wetlands inventory, evaluation of use, and development of protection strategies). J.T. Ratti
- Impact of climate change on northwest plants and animals. J.T. Ratti, R.A. Black, J.M. Scott
- Ten-year analysis of gray partridge population fluctuations and associated environmental factors. J.T. Ratti, K.P. Reese, J.J. Rotella
- Snag-site characteristics and their associated use by avian species in old-growth ponderosa pine forests in Montana. K.P. Reese, D. Wakkinen
- Seasonal movements, habitat use and productivity of Merriam's wild turkeys in southwestern Idaho. K.P. Reese, J.P. O'Neil
- Nest site characteristics of northern spotted owls in second growth forests of northern California. K.P. Reese, L.B. Folliard
- Sage grouse response to fire on the Big Desert. K.P. Reese, R.A. Fischer
- Winter movement and habitat use of sage grouse on the Big Desert. K.P. Reese, J.W. Connelly, M.D. Robertson
- Spring movements and nesting ecology of sharp-tailed grouse in southeastern Idaho. K.P. Reese, D. Meints
- Ecology of sympatric sage and sharp-tailed grouse. K.P. Reese, A.D. Apa, J.W. Connelly
- Wildlife use of the Pend Oreille River Reservoir in northeast Washington. K.P. Reese, J. Hall
- Evaluation of the Conservation Reserve Program lands in Idaho. K.P. Reese, J.W. Connelly, J.M. Sirotnak
- Determination of factors influencing upstream migration of Atlantic salmon in Icelandic rivers. D. Scarnecchia
- Analysis of life history strategies of Icelandic stocks of Atlantic salmon in relation to environmental factors. D. Scarnecchia
- Life history and ecology of Umpqua River spring chinook salmon. D. Scarnecchia
- Development of standard vegetation descriptors for the western continental United States. J.M. Scott, P. Bourgeron
- Review of endangered species recovery planning. J.M. Scott, P.H. Hayward
- Species content of nature reserves. J.M. Scott, B. Butterfield
- Species richness as a guide to protecting biological diversity in Idaho (GAP Analysis). J.M. Scott, S. Caicco, H. Anderson, C. Groves
- Development of better understanding of habitat requirements and population status for Idaho wildlife. J.M. Scott, K.P. Reese, J.M. Peek
- Development of database of wildlife issues and actions historically occurring in national parks. R.G. Wright.
- Study of lichens in southern part of Craters of the Moon National Monument. R.G. Wright
- Development of conceptual model to guide management and regulation of animal species in national parks. R.G. Wright
- Survey of potential wolf denning and rearing habitat in the Selway-Bitterroot Wilderness Area. J.J. Yeo
- The influence of habitat availability on pronghorn reproduction. J.J. Yeo, A.F. Reeve
- Environmental factors influencing pronghorn habitat selection in east-central Wyoming. J.J. Yeo, A.F. Reeve
- Sitka black-tailed deer forage quality comparisons in old-growth forests and clearcuts of southeastern Alaska. C.L. Rose, J.J. Yeo

Department of Forest Products

- Land application and composting of pulp and paper sludge. A.G. Campbell, R. Mahler, R.R. Tripepi
- Disposal of wood ash on agricultural lands. A.G. Campbell, R. Mahler, R.L. Folk
- Land application of log yard waste. A.G. Campbell, R. Mahler
- Classified log yard trash analysis and utilization. A.G. Campbell, R.L. Folk, R.R. Tripepi
- Wood ash as a soil additive and liming agent. A.G. Campbell
- Idaho pulp/paper mill feasibility project (PAG). A.G. Campbell, C.M. Falter, D.H. Bennett, M.H. Robison
- Technical and economic assessment of using small and medium size processing equipment to produce densified fuels for small and local markets. R.L. Folk, R.L. Govett, T.M. Gorman
- Assessment of wood pellet fuel quality and characteristics for Idaho and the Intermountain West. R.L. Folk, R.L. Govett
- Costs associated with installation and maintenance of timber bridges in the northwest U.S. T.M. Gorman
- Strategy, needs assessment, and program development for Idaho's forest products industry. T.M. Gorman
- Taiwan furniture industry. T.M. Gorman
- Roof sheathing temperature and moisture content. T.M. Gorman
- Simulation study of economic feasibility of various scales of co-generation for the Idaho forest industry. R.L. Govett
- Operation improvements to optimize profit in sawmilling-furniture rough-milling (Malaysia). R.L. Govett
- Soil compaction and production of feller-bunchers. L.R. Johnson
- Conceptual analysis of mobile merchandising centers. L.R. Johnson
- Decision model for wood residue supply. L.R. Johnson

Research Projects and Investigations

Costs of producing firewood from recovered slash. H.W. Lee
Woodland owners utilization guide. H.W. Lee
Environmental impacts on site productivity from increased utilization of biomass for energy and fiber. H.W. Lee
Effect of particle size and other material factors on the properties of gypsum-bonded particleboards. A.A. Moslemi
Use of sludge in mineral-bonded composites. A.A. Moslemi
Drying mixtures of tropical hardwoods. H.P. Steinhagen
Conditioning manual for veneer and plywood mills. H.P. Steinhagen

Department of Forest Resources

- Seed wafer development: effects of water-retention and rodent repellent chemicals on seed generation. D.L. Adams
Effects of micro-site characteristics on survival and growth of western redcedar regeneration. D.L. Adams, C. Lansing, R.T. Graham
Effects of fall planting date on survival and growth of container-grown seedlings. D.L. Adams, T. Catlin, R.T. Graham, D.L. Wenny
Effects of residual tree competition on regeneration establishment and growth. D.L. Adams, A. Schlenker, D. Ferguson
Soil properties as a factor in regeneration failures in the Grand Fir Mosaic. D.L. Adams, M. Sommer, R. Mahler
Effects of soil and climatic factors on height growth of common wind-break species. D.L. Adams, L. Townsend
Investigations on the Grand Fir Mosaic. D. Ferguson, D.L. Adams
Western redcedar animal damage and micro-site effects. D.L. Adams, et al (USFS Intermountain Research Station)
Molecular genetics and ecology of bitterbrush (*Purshia*). S.J. Brunfeld
Assessment of the genetic resources of Idaho's relict populations of Pacific flowering dogwood (*Cornus nuttallii*). S.J. Brunfeld
Evidence for interspecific chloroplast DNA recombination in *Salix*. S.J. Brunfeld
Chloroplast DNA systematics of *Cornus*. S.J. Brunfeld
Role of understory vegetation in nutrient cycling in the Douglas-fir/ninebark habitat type. J. Nelson, S.J. Brunfeld, R.T. Graham
Implementation of grasshopper stage-development models for Integrated Pest Management. B. Dennis, W. Kemp
Statistical inference for stochastic models in population ecology. B. Dennis, Y. Lim, N. Dilworth
Western white pine seed germination. R.K. Dumroese, D.L. Wenny
Survival of *Fusarium* root disease on Douglas-fir seedlings after outplanting. R.K. Dumroese, R.L. James, D.L. Wenny
Efficacy of sodium metabisulfite for sterilizing seedling growing containers. R.K. Dumroese, R.L. James, D.L. Wenny
Choosing nursery stock for landscaping and reforestation. R.K. Dumroese, R.L. Mahoney, D.L. Wenny
Vegetative propagation of western white pine. J.L. Edson, L. Fins, D.L. Wenny
Evaluation of performance of pedigreed Douglas-fir seedlings over six years and four environments. L. Fins, M. Rust, B. Wilson
Identification of improved seed and trees for use in reforestation. L. Fins
Genetic variation in the nutrient efficiency of Douglas-fir. L. Fins
Land use planning course for international participants. J.E. Force
Community stability in timber-dependent communities: a longitudinal study in north Idaho. J.E. Force, G.E. Machlis
Assessing *Gliocladium* for biological control of *Fusarium* root disease in container-grown Douglas-fir seedlings. R.L. James, R.K. Dumroese, D.L. Wenny
National Park Service—Visitor study of Everglades National Park. G.E. Machlis
Winter visitor study of the White House, Washington, D.C. G.E. Machlis
Profile of visitors to the Galapagos Islands. G.E. Machlis, D. Costa
Visitor Services Projects: Joshua Tree National Monument, Jean Lafitte National Historical Park, Natchez Trace Parkway, Jefferson National Expansion Memorial, Klondike Gold Rush National Historical Park, New River Gorge National River, Manassas National Battlefield Park, North Cascades National Park, Cape Cod National Seashore, Zion National Park. G.E. Machlis, M.E. Littlejohn, D. Madison, D.E. Dolson
High value hardwoods for timber, wildlife habitat, and water quality. R.L. Mahoney, Y. Carree, et al (Sandpoint, Moscow, and Caldwell Research and Extension Services)
Differences in water sources among conifer species along an elevation gradient. J.D. Marshall, L. Fins
Nitrogen and potassium nutrition in relation to susceptibility of Douglas-fir to armillaria infection. J.D. Marshall, T.M. Shaw
Isotopic identification of water sources in the xylem of conifers. J.D. Marshall
Assimilation of nitric acid vapor deposited on conifer foliage. J.D. Marshall
Maintenance respiration response of soybean and Norway spruce to ozone exposure. J.D. Marshall
Ecotypic differences in water-use efficiency of ponderosa pine, Douglas-fir, and western larch. J.D. Marshall, J. Zhang, L. Fins
Physiological ecology of a xylem-tapping mistletoe and its host. J.D. Marshall, J. Ehleringer, T. Dawson, L. Flanagan, D. Evans
Seasonal and storage impacts on cold hardiness of container-grown conifer seedlings. M.E. Montville, D.L. Wenny
Establishment of forest fertilization field trials in the Klickitat, Washington area. J.A. Moore
Fire ecology of whitebark pine. P. Morgan, S.C. Bunting
Status of whitebark pine in the northern Rocky Mountains. R.E. Keane, P. Morgan

Research Projects and Investigations

- Assessing *Trichoderma* for biological control of *Fusarium* root disease in container-grown Douglas-fir seedlings. M.R. Mousseaux, R.L. James, D.L. Wenny
- Idaho tree problems. A.D. Partridge
- Failure of urban trees. A.D. Partridge
- Physiology and ultrastructure of stain fungi. A.D. Partridge
- Analysis of the economy of a Yellowstone community. M.H. Robison
- Implementation of a site classification system for upland pine forests in central Honduras. C.T. Stiff
- The northern Rocky Mountains version of the Timber Resource Inventory Model—TRIM. C.T. Stiff, C.W. McKetta, R.O. Barkley
- Soil-site, and growth and yield models for *Pinus oocarpa* Schiede stands in central Honduras. C.T. Stiff, D.N. Perez, C. Valdez
- Psychological attributes of foresters that influence their use of computers. M.W. Stock
- Effects of stress on the genetic structure of mountain pine beetle populations. M.W. Stock
- Dynamics of forest ecosystems under stress. K.J. Stoszek
- Development and demonstration of "New Perspective"—Adaptive, ecosystem and landscape-based forest management approach. K.J. Stoszek
- Vegetation community mapping and changes along the Snake River from the Wyoming border to Henry's Fork, for 1940, 1960, and 1983 photoperiods. J.J. Ulliman
- Using digital elevation model data in a geographic information system to correct for topographical influences in synthetic aperture radar data. M. El Meslouhi, J.J. Ulliman
- Documentation of relative species richness of the South Fork Snake River. J.J. Ulliman
- Vegetation mapping and monitoring along the South Fork Snake River. J.J. Ulliman
- Remote sensing of white pine moisture stress. P.T. Wolter, D.L. Verbyla, B. Rock
- Workbook for satellite remote sensing in natural resources. D.L. Verbyla
- Improving techniques to propagate western white pine from branch cuttings and needle fascicles. D.L. Wenny, L. Fins, J. Edson
- Micropropagation of western larch from embryo and cotyledon tissue. D.L. Wenny, J. Edson
- Mass-micropropagation techniques for Idaho hybrid poplar. D.L. Wenny, J. Edson
- Conserving, through tissue culture, the unique and threatened Pacific flowering dogwood population in Idaho. D.L. Wenny, J. Edson
- A growing regime for container-grown Douglas-fir seedlings. D.L. Wenny, R.K. Dumroese

Department of Range Resources

- Fire effects on juniper soils. S.C. Bunting
- Use of prescribed fire in *Pinus pinaste* forests of Portugal. S.C. Bunting, F. Rego
- Modeling heat flow through soil. S.C. Bunting, P. Balatsos
- Fire effects in Caldénal vegetation of central Argentina. S.C. Bunting, R.M. Boo
- Determination of appropriate browse production and utilization methodology for land management monitoring. S.C. Bunting, J.L. Kingery
- Development of palatable resprouting shrubs. M. Hironaka
- Development and evaluation of management processes that promote the improvement of riparian resources on public land. K.L. Johnson, J.C. Mosley
- Interrelationships of wildlife and livestock use on tree establishment, survival, and growth in three different habitat types in northern Idaho. J.L. Kingery
- Sheep grazing as a silvicultural tool in conifer plantations. J.L. Kingery, J.C. Mosley, H.L. Osborne, S.D. McCoy
- An assessment of production and utilization measurement techniques for herbaceous vegetation. J.L. Kingery, S.C. Bunting
- Animal damage and plantation performance. J.L. Kingery, R.T. Graham
- Sheep grazing strategies for big game habitat improvement. J.C. Mosley, J.L. Kingery, H.L. Osborne, S.D. McCoy
- Diet nutrient quality of elk inhabiting a semi-arid environment. J.C. Mosley, D.C. Strohmeyer, J.M. Peek
- Habitat use and diet selection by Chihuahuan pronghorns. J.C. Mosley, E.L. Smith, K. Bahti
- Influence of streamside residual herbage on stream water quality. J.C. Mosley, D.E. Lucas, J.W. Walker, T.A. Lance
- Tree establishment and development patterns within a pinyon-juniper woodland. J.C. Mosley, D.W. Despain
- Growth of arctic and alpine plants in northern Norway. R. Robberecht
- Control of broom snakeweed on rangelands. K.D. Sanders
- Short duration grazing system on crested wheatgrass. K.D. Sanders
- Effects of drought on crested wheatgrass. K.D. Sanders
- Re seeding arid rangelands. K.D. Sanders

Research Projects and Investigations

Department of Resource Recreation and Tourism

Transmission of environmental ideology from Costa Rican school children to their parents. S.H. Ham, D. Sutherland

Interpretation in natural resources, agriculture and the environment—a practical guide for people with big ideas and small budgets (bilingual). S.H. Ham

Organizational change in the USDA Forest Service. C.C. Harris

A community model for informed land use decisions. C.C. Harris, M.H. Robison

Developing a knowledge-based system for improved amenity-resource valuation. C.C. Harris, W.J. McLaughlin

Measuring the impact of Idaho's tourism industry. C.C. Harris, M.H. Robison

Public task force to identify Limits of Acceptable Change (LAC) planning process to update the River Recreation Plan of the Hells Canyon National Recreation Area. E.E. Krumpe

Development and evaluation of interactive multimedia as a forestry education tool. E.E. Krumpe

Identification of different types of Idaho anglers. W.J. McLaughlin

Visitor services management on public lands, Lower Salmon River. W.J. McLaughlin

Strategies for local governments to encourage and access tourism development. W.J. McLaughlin

Policy Analysis Group (PAG)

Pulp mill feasibility and renewable natural resources in Idaho's Silver Valley. J. O'Laughlin, A.G. Campbell, D.H. Bennett, C.M. Falter, R.A. Lyman, K.A. Blatner, C.E. Keegan, A.C. Turner, M.H. Robison

Idaho citizen opinions about natural resources. J. O'Laughlin, W.J. McLaughlin, J.C. Freemuth

Idaho's timber supply and availability. J. O'Laughlin

Theses and Dissertations

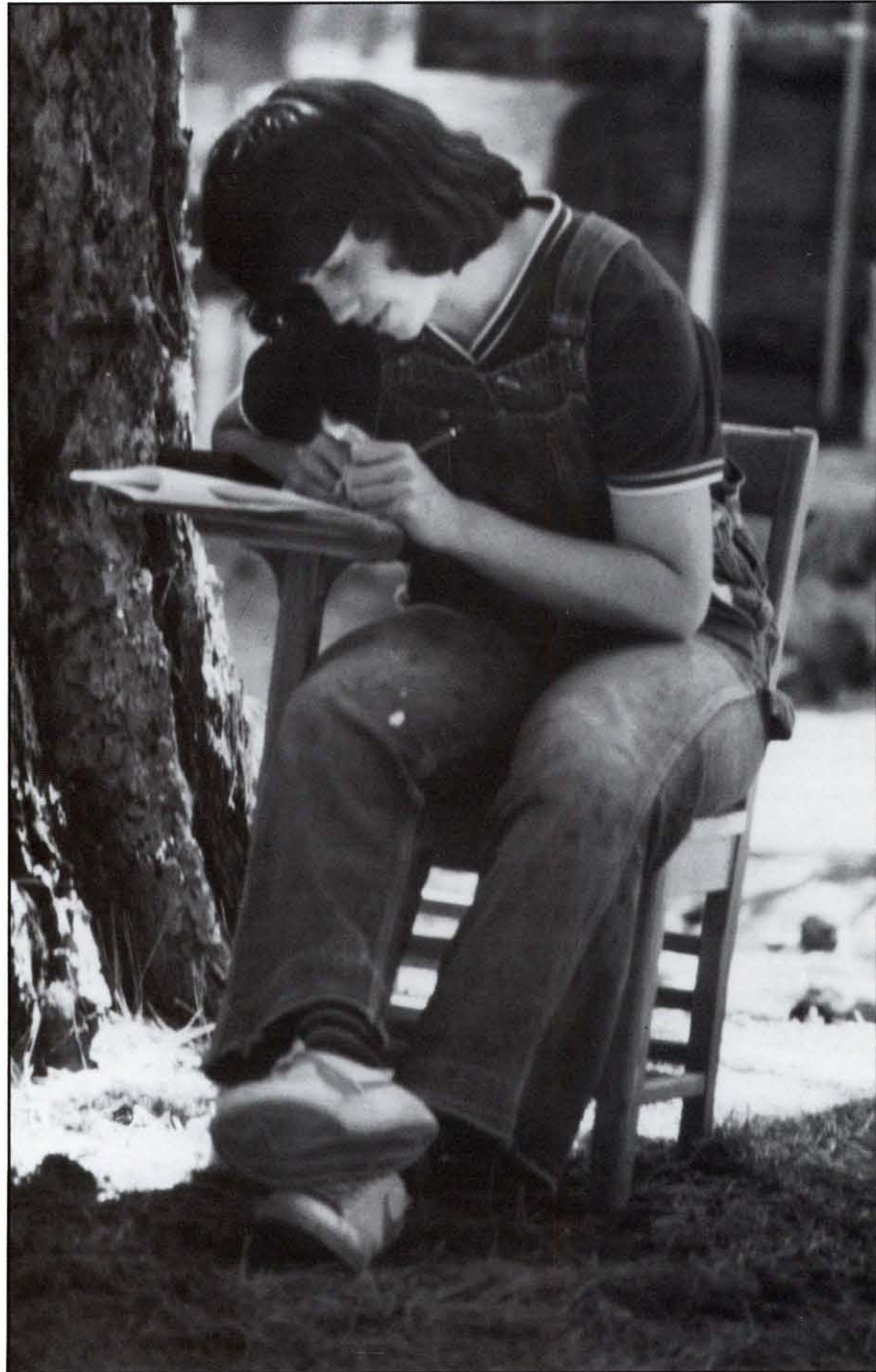
Master's Theses

- Amell, Larry L. A task analysis of the USDA Forest Service Region One's stand-level analysis process. *Major professor: M.W. Stock*
- Bolon, Natalie Ann. Idaho landowner hunter access policies and outdoor recreation opportunities. *Major professor: C.W. McKetta*
- Burton, Bruce Howard. Predator avoidance behavior of juvenile chinook salmon (*Oncorhynchus tshawytscha*) following crowding stress. *Major professor: J.L. Congleton*
- Cassirer, Elizabeth Frances. Responses of elk to disturbances by cross-country skiers in northern Yellowstone National Park. *Major professor: E.D. Ables*
- Chakanga, Moses. Optimal sampling design for estimating household fuelwood and charcoal consumption in Zambia. *Major professor: B. Dennis*
- Cleavenger, Richard W. Spreadsheet database and model for wood fuel alternatives for the University of Idaho heating plant. *Major professor: L.R. Johnson*
- Dagamaissa, Abdoulaye. Foresters' perceptions of village forestry in Mali. *Major professor: J.E. Force*
- Dunsmoor, Larry Keith. Relative prey importance and availability in relation to smallmouth bass growth in Brownlee Reservoir, Idaho, with notes on dietary indices. *Major professor: D.H. Bennett*
- Edson, John Lowther. Stem cuttings of western larch: shoot production; rooting; growth and form. *Major professor: D.L. Wenny*
- Fisher, Timothy Ray (1989). Application and testing of indices of biotic integrity in northern and central Idaho headwater streams. *Major professor: D.H. Bennett*
- Fulmer, Kathleen Fleming. Characterizing the functions of coyote vocalizations through the use of playback. *Major professor: E.D. Ables*
- Grigsby, William Joseph. Women's forest use, its social organization, and current and potential roles of credit in rural mail. *Major professor: J.E. Force*
- Hajib, Said. Regional forest supervisors' opinions of protected area management in Morocco. *Major professor: W.J. McLaughlin*
- Johnson, Jan Verlin. A comparison of operational methods for compiling road centerlines on large scale line maps. *Major professor: J.J. Ulliman*
- Martin, Robert Charles. Sage grouse responses to wildfire in spring and summer habitats. *Major professors: W.B. Kessler, J.M. Peek*
- Montville, Mark Edward. Foliar fertilization of container-grown conifer seedlings. *Major professor: D.L. Wenny*
- Pauley, George Ross. Habitat use, food habits, home range, and seasonal migration of white-tailed deer in the Priest River Drainage, North Idaho. *Major professor: J.M. Peek*
- Rubin, Stephen Paul. An evaluation of the instream flow incremental methodology for juvenile chinook salmon and steelhead in Idaho streams. *Major professor: T.C. Bjornn*
- Samih, Allal. Single-tree total height estimators for second-growth Douglas-fir in the Inland Northwest. *Major professor: C.T. Stiff*
- Stoker, Robert. The relationship of harvesting and site preparation activities to site productivity: Effects on height growth, foliage nutrient levels, and soil properties in three north-central Idaho Douglas-fir plantations. *Major professor: H.W. Lee*
- Strach, Russell Matthew. An evaluation of cutthroat trout produced in Priest Lake tributaries. *Major professor: T.C. Bjornn*
- Swenor, Linda Laraine. Mountain lion social organization in a desert environment. *Major professor: M.G. Hornocker*
- Tinnemore, Rodney Thomas. The feasibility of advancing urban forestry in selected communities of the Inland Pacific Northwest. *Major professor: A.D. Partridge*
- Wakkinen, Wayne Leon. Nest site characteristics and spring-summer movements of migratory sage grouse in southeastern Idaho. *Major professor: K.P. Reese*
- Wang, Zheng-Guang. Effects of cupric carbonate on container-grown seedlings of ponderosa pine during greenhouse production. *Major professor: D.L. Wenny*
- Warren, Christopher Dodge. Ecotypic response and habitat use of caribou translocated to the southern Selkirk Mountains, northern Idaho. *Major professor: J.M. Peek*
- Weesner, Margaret Wood. Relationships between campsite characteristics and level of recreation impact. *Major professor: E.E. Krumpke*
- Weiner, Eric John. Anticipated effects of the 1986 federal tax code revision on private nonindustrial timberland owners in Idaho. *Major professor: C.W. McKetta*
- Wellner, Kent Thomas. Germination, survival, and growth after three years of four coniferous tree species on burned and unburned seedbeds of three different duff depths on a *Thuja plicata/Clintonia uniflora-Clintonia uniflora* habitat type. *Major professor: L.F. Neuenschwander*
- Worman, Douglas B. A financial investigation of integrating farm woodland management into the overall farm management plan. *Major professors: H.L. Osborne, J.J. Ulliman*
- Zhang, Jianwei. Genetic variation in shoot growth and patterns of shoot development in western larch. *Major professor: L. Fins*
- Zhang, Weibing. Simultaneous diameter and height increment models for second-growth Douglas-fir in the Inland Northwest. *Major professor: C.T. Stiff*

Theses and Dissertations

Ph.D. Dissertations

- Balice, Randy Guy. Interactions between fungal root diseases and coniferous forest vegetation. *Major professor: J.J. Ulliman*
- Du, Wei. Incorporating genetic effects into a forest growth and yield model. *Major professor: L. Fins*
- Etiégni, Lazare. Wood ash recycling and land disposal. *Major professor: A.G. Campbell*
- Heok-Choh, Sim. Maximizing profit using operations research techniques for the conversion of small logs to furniture shorts. *Major professor: R.L. Govett*
- Jélvez, Manuel Arnaldo. An assessment of Chile's future role in Pacific rim markets. *Major professor: R.L. Govett*
- Keay, Jeffrey Alan. Black bear population dynamics in Yosemite National Park. *Major professor: E.O. Garton*
- Meimban, Julian J., III. Risk and economic feasibility analyses of a 6-MW and a 9-MW wood-fired cogeneration capacities that can be developed from an existing wood-fired steam plant of a university. *Major professor: R.L. Govett*
- Miquelle, Dale George. Behavioral ecology of moose in Denali National Park and Preserve, Alaska. *Major professor: J.M. Peek*
- Nguyen, Can Thien. The development and validation of a metamodel for yield estimation. *Major professors: C.R. Hatch, D.L. Adams*
- Rotella, Jay Joseph. Habitat use, movements and survival of mallard broods in southwestern Manitoba. *Major professor: J.T. Ratti*
- Zhang, Lianjun. A compatible forest growth and yield prediction system for managed Douglas-fir stands in the Inland Northwest. *Major professor: J.A. Moore*



Fred Johnson

Continuing Education and Outreach

Continuing Education and Outreach

Faculty in the College of Forestry, Wildlife and Range Sciences conduct continuing education programs for natural resource professionals and outreach programs for the public on campus, at the Clark Fork and McCall Field Campuses, and throughout Idaho and the West. The college offered the following continuing education and outreach programs during 1990. Most programs scheduled for 1991 are also listed.

More information is available from Continuing Education, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho, 83843, (208) 885-6441.

Continuing Education

1990

| | | | |
|---------------------|---|------------------------|--|
| January | Coordinated Resource Management—Boise | June | Log Scaling and Manufacturing Workshop—Princeton |
| February 7 | Intensive Grazing Systems—Arco | June 4-8 | Tribal Forest Products Enterprise Shortcourse Series: Forest Products Enterprise Development and Feasibility Studies (in cooperation with Bureau of Indian Affairs)—Moscow |
| February 15 | Marketing Basics for Public Land Managers (in cooperation with Montana State University)—Boise | June 7-8 | Range Monitoring Workshop—Mountain City, Nevada |
| February 21 | Range Monitoring Workshop—Twin Falls | June 10-16 | Central Idaho Natural Resources Workshop—Ketchum |
| February 28-March 1 | The Seventh Annual Inland Empire Forest Engineering Conference—Moscow | June 11-15 | Wood Products Academy—Moscow |
| March 5-16 | Leadership and Communication Workshop—Moscow | June 11-July 20 | Land Use Planning for Community Forestry and Natural Resource Development—Moscow |
| March 7-8 | Coordinated Resource Management Workshop—Boise | June 16 | Riparian Workshop—DuBois |
| March 13 | Woodland Marketing Workshop—Lewis and Clark State College, Lewiston | June 17-23 | Inland Empire Natural Resources Camp—Harrison |
| March 15-16 | Inland Empire Tree Improvement Cooperative (IETIC) Annual Meeting and Workshop—Post Falls | June 25-August 3 | Training Program for Southeast Asia Wildlife Preserve Managers—Moscow |
| March 19-23 | Tribal Forest Products Enterprise Shortcourse Series: Introduction to Forest Products Enterprise Business and Feasibility Studies (in cooperation with Bureau of Indian Affairs)—Moscow | June 28 | Demonstration Day—UI Experimental Forest |
| April 2-May 13 | Bolivian Forester Training Course—Moscow | July | Uneven-Aged Management Workshop (in cooperation with Oregon State University)—La Grande, Oregon |
| April 5 | Planning for Drought (Range Workshop)—Salmon | July | Wood Pellet Manufacturing Short Course—McCall |
| April 6 | Planning for Drought (Range Workshop)—Challis | July 9-13 | Fish and Wildlife Ecology Workshop I (for teachers)—McCall |
| April 6-8 | Interpersonal Communications for Students and Professionals in Natural Resources—Clark Fork | July 15-18 | South Idaho Tree Workshop—Emmett |
| April 9-13 | Executive Leadership of Political and Social Forces in Natural Resources—Moscow | July 16-20 | Fish and Wildlife Ecology Workshop II (for teachers)—McCall |
| April 10-12 | Forest Soil Productivity and Management Symposium—Boise | July 26 | Log Manufacturing and Scaling Workshop—UI Experimental Forest |
| April 11 | Planning for Drought (Range Workshop)—Arco | July 29-August 1 | Lewis and Clark Trail Heritage Foundation National Convention—Lewiston |
| April 23-27 | Tribal Forest Products Enterprise Shortcourse Series: Introduction to Forest Products (in cooperation with Bureau of Indian Affairs)—Moscow | August 1-September 26 | UI/Honduras Forestry Field Training Course—Moscow |
| April 24 | Log Scaling and Manufacturing Workshop—Kueterville | September-December | Range Monitoring Workshops (tentative)—Arco, Salmon, Challis |
| May 24-25 | Hardwood Growers Field Tour—Bonners Ferry | September 5-November 7 | Integrating Wildlife Ecology Into the Classroom Curriculum—Kamiah |
| | | September 17-21 | Wood Products Academy—Moscow |
| | | September 29-30 | Inland Empire Christmas Tree Workshop—Boise |
| | | October 8-12 | Ninth Annual Inland Empire Dry Kiln Workshop—Moscow |
| | | October 14-17 | 2nd International Inorganic Bonded Wood and Fiber Composite Materials Conference—Moscow |
| | | October 15-26 | Forest Regeneration and Site Preparation—Moscow |
| | | October 29-31 | Gap Analysis: A Workshop on Protecting Biodiversity Using Geographic Information Systems—Moscow |
| | | November 3 | Hardwood Growers Workshop—Culdesac |
| | | November 28-29 | New Perspectives Workshop—Moscow |

Continuing Education and Outreach

1991

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|---------------------|---|-----------------------|--|
| January 2-4 | Plant Protection—Post Falls | June | Monitoring Forest Service Rangelands—Jackpot, Nevada |
| February | Improved Pasture Management—Arco | June 17-21 | Wood Products Academy Shortcourse: An Introduction to Quality Control—Moscow |
| February 2 | Coordinating Livestock Grazing with Silvicultural Objectives, Grazing Allotment Planning Workshop (for Clearwater-Potlatch Timber Protection Association)—Orofino | June 24-28 | Satellite Remote Sensing for Natural Resource Management (Workshop A)—Moscow |
| February 4-7 | BIA/Tribal Executive Leadership for Natural Resource Management—Moscow | July | Habitat Typing and Basic Community Ecology—Bonners Ferry |
| February 12-14 | Pacific Northwest Range Shortcourse: Managing Herbs and Shrubs for Multiple Use—Moscow | July | Management Implications for Habitat Types—Coeur d'Alene |
| February 18-21 | Workshop: Statistical Methods and Data Analysis for Fish and Wildlife Biologists—Moscow | July 8-13 | Fish and Wildlife Ecology Workshop (for teachers)—McCall |
| February 25-March 1 | 13th Annual Aerial Photography/Remote Sensing Workshop—Moscow | July 11-12 | We Grow Full Circle—A Field Tour of Working Forests—McCall |
| February 26-27 | Fire Behavior (Session I)—Moscow | August 1-September 27 | UI/Honduras Forestry Field Training Course—Moscow |
| February 27-28 | Fire Behavior (Session II)—Moscow | August 5-9 | Satellite Remote Sensing for Natural Resource Management (Workshop B)—Moscow |
| March 5-6 | Eighth Annual Inland Empire Forest Engineering Conference—Moscow | September (tentative) | Wood Products Academy Shortcourse: Wood Composites—Coeur d'Alene |
| March 13 | Coordinated Management Workshop (Range)—Challis | September (tentative) | Wood Products Academy Shortcourse: The Industry—An Overview for Non-Forest Products Executives—Coeur d'Alene |
| March 14 | Inland Empire Tree Improvement Cooperative (IET-IC) Annual Meeting and Workshop—Post Falls | October 12-18 | Tenth Annual Inland Empire Dry Kiln Workshop—Moscow |
| March 18-21 | National Bioenergy Conference—Coeur d'Alene | October 20-November 8 | CEFES: Continuing Education in Forest Ecology and Silviculture—Moscow |
| March 26-27 | Regional Non-Industrial Private Forestry (NIPF) Woodland Marketing Workshop—Moscow | November (tentative) | Wood Products Academy Shortcourse: Forest Products Marketing—Moscow |
| April | Range Monitoring Workshop—Arco | | |
| April 1-2 | Fish and Wildlife Leadership and Communications Workshop—Moscow | | |
| April 1-12 | Leadership and Communications Workshop (for USFS Professionals), restricted enrollment—Moscow | | |
| April 2-4 | Fire Behavior—Boise | | |
| April 5-7 | Interpersonal Communication Skills—Clark Fork | | |
| April 8-12 | Wood Products Academy: Basic Course—Moscow | | |
| April 17 | Log Manufacturing and Scaling Workshop (for Konkolville Lumber Company)—Konkolville | | |
| April 23-25 | Wood Products Academy Shortcourse: The Industry Forest Products Academy for Non-Forest Products Executives—Boise | | |
| June-July | Training Program for Southeast Asia Nature Preserve Managers—Moscow | | |
| June | Habitat Typing and Basic Community Ecology—Grangeville | | |
| June | Habitat Typing and Basic Community Ecology—Wallace | | |
| June | Natural Resources Conservation Workshops—Ketchum, Harrison | | |

Outreach

1990

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|------------|--|
| March 3 | Animal Tracks and Winter Ecology—Clark Fork |
| March 4 | Animal Tracks and Winter Ecology (repeat)—Clark Fork |
| March 17 | North Idaho Fishing—Clark Fork |
| April 21 | Community Forestry Day—Deary |
| April 21 | Advanced Fly Tying and Casting—Clark Fork |
| April 28 | Idaho Tree Farm Program—Moscow |
| April 28 | 4-H Natural Resources Contest—Moscow |
| May 19 | For Bird Lovers Only—Clark Fork |
| June 2 | Wildflowers—Clark Fork |
| June 13-15 | Eagles and Ospreys of the Greater Yellowstone—Teton Science School, Kelly, Wyoming |
| June 13-17 | Behavior of Ungulates—Yellowstone National Park |

Continuing Education and Outreach

| | | | |
|----------------------|---|----------------------|--|
| June 21-24 | Field Botany: Teton Flora—Teton Science School, Kelly, Wyoming | 1991 | |
| June 23-26 | Interpreting Animal Tracks and Sign—Teton Science School, Kelly, Wyoming | March 16 | History of North Idaho—Clark Fork |
| July 9-11 | Rocky Mountain Wildflower Photography—McCall | April 13 | Fishing for the Big Ones—Clark Fork |
| July 15-20 | Alpine Ecology—Teton Science School, Kelly, Wyoming | April 27 | Tree Planting—Moscow |
| July 15-21 | Elderhostel: Wild Country Botanizing: Lake Pend Oreille Geology and Ecology, Forests and Forest Management—Clark Fork | May 18 | For Bird Lovers Only—Clark Fork |
| July 17 | History and Archaeology of Warren's Chinese Occupation—McCall | May 25-26 | Spring Bird Identification—McCall |
| July 21-22 | Wildflower Identification—McCall | June 1 | Spring Mushrooms—Clark Fork |
| July 22-25 | Pattern in Nature—Teton Science School, Kelly, Wyoming | June 3-28 | Wildland Ecology—McCall |
| July 30- August 3 | Understanding Animal Behavior—Teton Science School, Kelly, Wyoming | June 9 | Ethnobotany—Clark Fork |
| July 30- August 3 | Natural Science Illustration—Teton Science School, Kelly, Wyoming | July 9 | Mushrooms of McCall—McCall |
| August 11 | History of North Idaho Railroads—Clark Fork | July 10 | History and Archaeology of Warren's Chinese Occupation—McCall |
| August 15 | Extension Field Day—Sandpoint | July 13-14 | Wildflower Identification—McCall |
| August 17 | Deforestation in the Andes—McCall | July 14-20 | Elderhostel: Endangered Species, Old-Growth Forest, and Biodiversity—Clark Fork |
| August 22 | Tree Farm Forestry Day—Moscow | July 15-18 | Exploring Idaho's River Frontier through Writing and Rafting—McCall |
| August 27-29 | Alpine Landscape Photography—McCall | July 28 | Outdoor Photography—Clark Fork |
| September 8 | North Idaho Folklore—Clark Fork | July 29- August 2 | Raku Ceramics—McCall |
| September 22 | Fossil Collecting and Geologic Tour of the Lake Pend Oreille Area—Clark Fork | July 29- August 2 | Get in Touch with Earth and Water! Environmental Geology and Hydrology Workshop—McCall |
| September 23 | Fossil Collecting and Geologic Tour of the Lake Pend Oreille Area (repeat)—Clark Fork | August 5-9 | Drawing from Nature—McCall |
| October 4-6 | Fall Colors of the High Country Photography—McCall | August 19-20 | Understanding the Use of Light in Photography—McCall |
| October 6 | Wetland Ecology and Water Birds—Clark Fork | August 24 | Water Color Painting from Nature—Clark Fork |
| October 20 | Rocks, Rocks and Minerals—Clark Fork | September 7 | Deforestation in the Highlands of South America—McCall |
| November 3 | Astronomy—Clark Fork | September 7 | Deforestation in the Highlands of South America—A Disappearing Treasure—McCall |
| | | September 8 | Fossil Collecting and Geologic Tour of the Lake Pend Oreille Area (repeat)—Clark Fork |
| | | September 24-27 | From Management to Leadership—McCall |
| | | October 4-5 | Astronomy—Clark Fork |
| | | November 9 | Christmas Nature Crafts—Clark Fork |

Agency and Funding Support

Agency and Funding Support

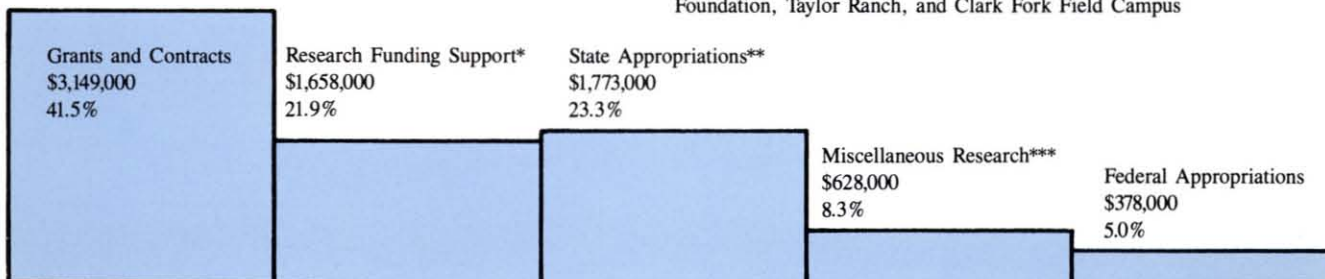
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 Washington State University
 Washington Water Power Company
 Western Forestry and Conservation Association
 West One
 Weyerhaeuser Company
 The Wilderness Society
 Wildlife Management Institute
 The Wildlife Society
 Winrock International Institute

Fiscal Year 1990 Financial Picture

Research expenditures, shown by funding source, totaled \$7,586,000 for the fiscal year 1989-90.



*Includes overhead allowances, external matching, outside federal unit support, and external cooperative research support

**Includes FWR Experiment Station, Wildlife, Wilderness, and Forest Utilization Research

***Includes Forest Research Nursery, Experimental Forest, Idaho Research Foundation, Taylor Ranch, and Clark Fork Field Campus

Director's Score Card

Productivity: 1987-1990

| | Departments | | | | | Total |
|-----------------------|---------------------------|-----------------|------------------|-----------------|---------------------------------|-------|
| | Fish & Wildlife Resources | Forest Products | Forest Resources | Range Resources | Resource Recreation and Tourism | |
| 1987 | | | | | | |
| Research FTE's | 2.5 | 1.9 | 6.4 | 1.5 | 0.7 | 13 |
| Books | 0 | 0 | 2 | 0 | 1 | 3 |
| Chapters in Books | 0 | 0 | 2 | 2 | 2 | 6 |
| Refereed Publications | 34 | 9 | 30 | 7 | 4 | 84 |
| Other Publications | 6 | 9 | 38 | 11 | 3 | 67 |
| 1988 | | | | | | |
| Research FTE's | 2.5 | 1.9 | 6.4 | 1.5 | 0.7 | 13 |
| Books | 0 | 0 | 2 | 0 | 0 | 2 |
| Chapters in Books | 1 | 0 | 2 | 0 | 1 | 4 |
| Refereed Publications | 20 | 6 | 25 | 4 | 4 | 59 |
| Other Publications | 27 | 15 | 56 | 1 | 17 | 116 |
| 1989 | | | | | | |
| Research FTE's | 2.5 | 1.9 | 6.4 | 1.5 | 0.7 | 13 |
| Books | 0 | 0 | 2 | 0 | 0 | 2 |
| Chapters in Books | 6 | 7 | 11 | 9 | 3 | 36 |
| Refereed Publications | 18 | 9 | 23 | 4 | 7 | 61 |
| Other Publications | 30 | 11 | 46 | 5 | 26 | 118 |
| 1990 | | | | | | |
| Research FTE's | 3 | 1.9 | 6.9 | 1.5 | 1.3 | 14.6 |
| Books | 0 | 2 | 3 | 0 | 0 | 5 |
| Chapters in Books | 1 | 0 | 2 | 1 | 2 | 6 |
| Refereed Publications | 26 | 13 | 34 | 4 | 8 | 85 |
| Other Publications | 31 | 23 | 72 | 10 | 25 | 161 |

¹FTE = the equivalent of one full-time researcher paid by the state of Idaho

Since its inception in 1909, the College of Forestry, Wildlife and Range Sciences at the University of Idaho has become one of the oldest and most highly regarded natural resource schools in the United States. As part of the state's land grant institution, the college serves the state through teaching, research, and service. College research is administered through the Idaho Forest, Wildlife and Range Experiment Station, established by the Idaho legislature in 1939 to conduct research on the state's renewable resources.

The experiment station has the equivalent of 14.6 full-time researchers funded by the state of Idaho. However, all 68 of the college's faculty members conduct research, as do most of its 175 graduate students. The faculty spend about one-third of their time on research, much of it paid for through outside grants and contracts.

During the 1990 fiscal year, income from outside grants and contracts totalled \$3.8 million. State appropriations for research at the experiment station amounted to an additional \$1.7 million. For every dollar appropriated by the state for experiment station research during fiscal 1990, faculty grants and contracts brought in about \$2.00.

Changes: 1986-1990

| | 1986 vs. 1990 Percent Change | 5-year Total |
|---|---------------------------------|-----------------|
| Graduate Student Enrollment | +14% | — |
| Outside Grants & Contracts ² | +124% | \$14.4 million |
| Books | -17% | 18 |
| Chapters in Books | +50% | 64 |
| Refereed Publications | +23% | 358 |
| Other Publications | +120% | 535 |

²Fiscal years

From the Director



John C. Hendee

Community Involvement—The Key to Our Future

Improving our ability to anticipate and respond to change is a key function of any university. Focusing on changes that most directly affect the lives of the people of Idaho is our charge as Idaho's land grant university. For the College of Forestry, Wildlife and Range Sciences, this means giving priority to those areas of teaching, research, and service that hold the greatest promise of helping Idaho manage her renewable natural resources to accommodate changing and often conflicting demands. Because the challenges facing Idaho mirror those facing many countries and regions of the world, the lessons we learn here also offer the exciting promise of national and international applications.

Change is reflected in shifting priorities, priorities spawned by market demands, social forces, and public policy responding to the growing environmental awareness of an increasingly involved public. Recently, the driving forces shaping future renewable resource management have focused on protecting water quality, designated wilderness, and ancient forests. They are demanding sensitive management for biodiversity, critical habitat, and recovery of endangered species like the spotted owl, salmon, wolves, and grizzlies. They have fashioned policy to account for increasing needs for wood, livestock forage, wildlife and fish for game and nongame uses, and recreational use and landscapes for tourists seeking natural resource-based opportunities.

The over 200 studies currently underway at the experiment station reflect the energy of our faculty to address these issues. Their energy springs in part from their involvement with external constituent groups who shape their interests and generate the necessary resources to achieve solutions. Developing and maintaining open communication with an extensive network of advisors has been key to acquiring the kind of support that has propelled our external grants and contracts up from \$1.3 to \$4.3 million over the past five years. Our external advisors include the FWR Guidance Council, a 70-person group of state, regional, and national leaders representing all Idaho natural resource interests; the legislatively-chartered Policy Analysis Group Advisory Committee; a Forest Nursery Advisory Committee of 20 representatives from the state's seedling industry and reforestation interests; steering committees for the Inland Empire Tree Improvement Cooperative and the Intermountain Forest Tree Nutrition Cooperative; and the steering committee for the Wood Use and Design Program. External reviews of the Cooperative (National) Park Studies Unit and the Idaho Cooperative Fish and Wildlife Research Unit provide additional advice, as do the trustees of the FWR Alumni Association who meet semi-annually at the college.

The past year afforded a high degree of involvement with Idaho communities and our advisory groups. We held town meetings in Bonners Ferry and Burley to discuss college programs, and conducted several tours, among them a journey through southern Idaho and the Clearwater National Forest last summer to help orient President Zinser—to be the first in a tradition of annual tours led by the FWR Guidance Council Chair.

We are fortunate and grateful for the help and support of all the busy people who volunteer their personal time and expense to advise us. This spring for example, more than 90 members, spouses, guests, and trustees of our college Alumni Association attended the sixth annual FWR Guidance Council meeting. In June, the college held its first Guidance Council Chairs' Tour. Over 40 resource leaders, faculty, and legislators spent two-and-a-half days in the field gleaning firsthand knowledge about the natural resource and socioeconomic hurdles facing Valley County, then drafted several initiatives toward overcoming those hurdles.

The experiment station's research agenda derives from an ambitious process of involvement and outreach. It reflects the commitment of our faculty to science and service in solving real world problems, and the determination of the college as a whole to improve the natural environment and quality of life in Idaho, and elsewhere.

John C. Hendee



University of Idaho



University of Idaho

Idaho Forest, Wildlife and Range Experiment Station
College of Forestry, Wildlife and Range Sciences
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