# Idaho Forester

## A Magazine of Natural Resources

# 1988

An annual publication by the students of the College of Forestry, Wildlife and Range Sciences
at the University of Idaho

# Dedication

This year's *Idaho Forester* is dedicated to Professor Emeritus of Forest Resources, Chi-Wu Wang. Dr. Wang died of cardio-pulmonary arrest, December 21, 1987, in Moscow, Idaho. Chi-Wu Wang came to the College of Forestry, Wildlife and Range Sciences in 1960. A forest geneticist, he officially retired in 1978, although he maintained active ties to the college, especially as the relationship with the Ministry of Forestry of the People's Republic of China grew more extensive.

Dr. Wang was born in China in 1913, and in 1933 graduated from the Tsing Hua University at Beijing. In the years immediately following his graduation, he traveled his native country extensively, collecting the information and specimens that would ultimately culminate in his book, *Forests of China,* published in 1961 by Harvard University.

He came to the United States in 1946 to attend Yale University, from which he received a Master of Science degree the following year. He went on to Harvard and received his Ph.D. in 1953, subsequently teaching forest genetics at the University of Florida at Gainesville before coming to University of Idaho's FWR in 1960.

He is credited with many contributions to forest genetics and tree improvement. In 1960, he initiated an Idaho forest tree improvement cooperative, focusing primarily on ponderosa pine. It has since grown into the Inland Empire Tree Improvement Cooperative (IETIC), an organization of over 20 forest industries, federal and state agencies and universities. The goal of the IETIC is the genetic improvement of six species of economically important forest trees.

On December 7, Dr. Wang's wife, Ya-Yen, a University of Idaho professor of Computer Science, was presented on his behalf, the college's first Distinguished Career Award. Dean John Hendee presented the award and praised Dr. Wang on his role through the late 70's and early 80's in constructing the cooperative relationship that now exists between the Ministry of Forestry, the College, and the University. Since 1979, more than 60 Chinese students and scholars have studied at the College of Forestry, Wildlife and Range Sciences.

Dr. Chi-Wu Wang was an outstanding teacher, advisor, and mentor to a great many students of forest genetics from the U.S., China, and other countries as well. His passing represents a great loss to the college and to his profession, but most of all to the students.

# Table of Contents

# Letter From The Editor

We were the only two who showed up for the first *Idaho Forester* meeting last fall. "We're interested in maybe writing for the magazine, or generally just helping out," we said. That was perfectly fine with Joe, but "We really need people to fill positions, and so far we have openings in all of them — but what we really need is an editor." A volunteer. Someone to be in charge. A scary thought, but sitting side by side on that lumpy old plaid couch under the clock in the Reading Room, Cindy and I cautiously scoped each other for a moment and said, "I'll be an editor if you'll be one."


So began one of the most interesting projects we worked on. Sure, more people joined the Forester staff as the weeks went by, and its funny how we were able to reach a balance of interests and talents in the ways people were willing to contribute. Learning how to put together a magazine was an education in itself, but it turned out, for us, to be secondary in terms of the benefits gained from being part of the staff. More importantly, we found ourselves making contacts with professors in each of the five departments while hunting for article topics, we learned some of the ins and outs relating to administrative procedures, learned our way around the FWR Publications Lab, and perhaps most important are the friends we made. For new students like ourselves, being part of the *Forester* staff has helped integrate us into the college to a degree that probably wouldn't have been possible through our involvement in any other student activity.

Beyond the serious stuff, we had a lot of fun, ate free pizza, worked late hours and skipped classes the last week doing paste-up in order to make deadline. We proofread articles so many times we doubt we'll read the finished product, but we will enjoy looking again at our photos and drawings. We apologize to alumni for lack of solicitation for their news, but that was due to a unique situation beyond editorial control. Enjoy!

Sarah Topp
Cindy Sills


# Feature Articles

# Caribou, Grizzly Bears, and Wolves

**by Bart Butterfield, James Peek, David Volson, Chris Warren**

Threatened and endangered species of wildlife occupy more and more of the public's attention. In some cases, concern is primarily over conservation of the species, as with the whooping crane. In other cases, concern over conservation of the species is mixed with concern over the economic consequences that may be involved in measures taken to manage the species. Such is the case with mountain caribou, grizzly bears and wolves, species which are classified as threatened or endangered because in the contiguous United States their numbers are few and their range is drastically limited. An extensive effort to identify habitat requirements and pinpoint limiting factors for these species is in progress with the Idaho Fish and Game Department, U.S. Fish and Wildlife Service, USDA Forest Service, and the University of Idaho. These efforts will evaluate ways to provide for these species and accommodate the economic concerns, if past experience is any guide.

**Caribou** The caribou project centers around a translocation of twenty-four woodland caribou in March, 1987, to the Selkirk Mountains of northern Idaho.

The effort was directed by the Idaho Department of Fish and Game, with U.S. Fish and Wildlife Service, USDA Forest Service, the British Columbia Ministry of Environment-Wildlife Branch, Ministry of Forests, Washington Department of Game, and the University of Idaho involved.

The translocated caribou represent two ecotypes from two distinct herds in British Columbia. The first group of twelve, including two young bulls and ten cows, was captured during the second week of March in the Goldstream River area north of Revelstoke, B.C. Each animal was immobilized with a small net shot from a helicopter, then subdued by ground crews. After being collared and ear-tagged, the caribou were flown in slings below the helicopter to a temporary holding pen. They remained in the enclosure for three days in order to complete testing for tuberculosis. During this time they were given fresh-cut lichen collected in the area. Finally, the caribou were transported approximately 350 miles in horse trailers to the release site west of Bonners Ferry, Idaho.

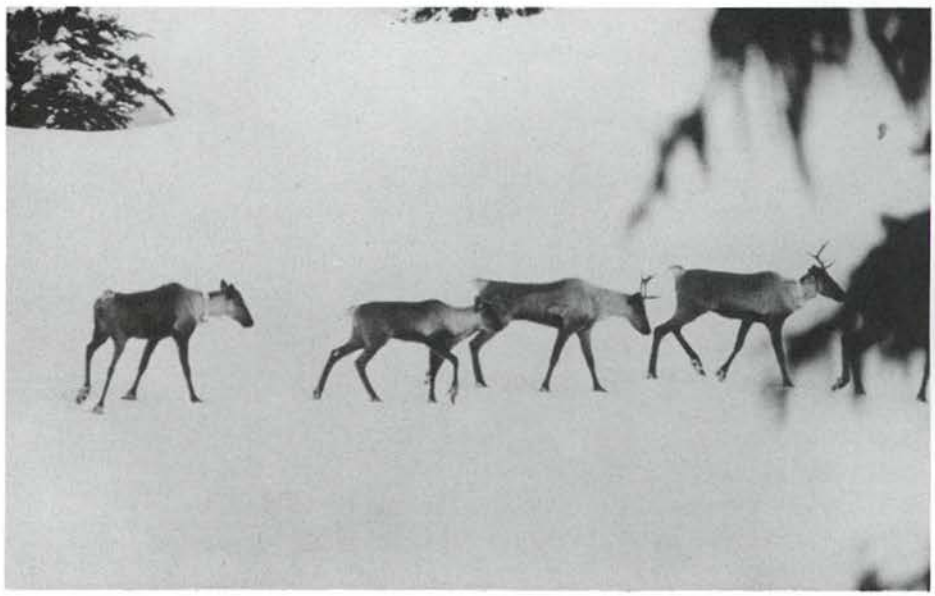
The second group of twelve caribou, also comprised of two young bulls and ten cows, was captured in the Itcha Mountain area west of Williams Lake, B.C., during the third week of March, 1987. These caribou were captured, up to six at a time, by herding them with a helicopter into large, preset drive nets on the ground. After being subdued, tagged and collared, they were flown to a temporary holding pen for tuberculosis testing. They were then transported approximately 800 miles to the release site. Only two caribou, a bull and a cow, sustained serious injuries during capture and holding operations and had to be destroyed.

Since their release in late March, 1987, the movements, reproduction, and survival of the translocated caribou have been monitored by the Idaho Department of Fish and Game.

The University of Idaho is involved in determining the habitat use patterns of the translocated caribou. The study will describe habitats used by the translocated caribou, and compare habitat use patterns of translocated animals from each source with the resident herd. This information will aid in development of habitat management guidelines for the area and aid in assessing the success of the re-establishment effort. The information may shed light on the advantages and disadvantages of using different ecotypes of a species for attempts to re-establish or increase populations.

Of the twelve Itcha Mountain caribou, one disappeared just after release, two died over the summer, two joined the resident herd in B.C., one remains just over the B.C. border alone, and the remaining six are still in the U.S. Of the twelve Goldstream River caribou, two have slipped their collars, four joined the resident herd, four have crossed the Kootenay Valley and apparently have become established with another B.C. herd near the Goat River twenty miles north of Creston, B.C., and four remain in the U.S. One group of five caribou in the U.S. contains animals from both groups.

The distances moved by most of the translocated caribou have been greater than those recorded for the resident animals. Some of the translocated caribou have also used very dissimilar habitat over the summer, fall, and early winter compared to what is typical for the resident herd. The translocated caribou are still exploring and have probably not established traditional use patterns in the new area. This work will continue through Winter, 1989.



Radio collared caribou mixing with the resident herd after translocation.

**Grizzly Bears** The Selkirk mountains also contain a small grizzly bear population. Between the late 1800's and 1981, there were 93 documented sightings of grizzly bears or grizzly sign from within the Selkirks. Along with the sightings, 39 grizzly bears were killed. In 1975 the grizzly bear was classified as endangered under the Endangered Species Act. The Selkirks were subsequently designated as one of six ecosystems in the conterminous 48 states where grizzly bear recovery is possible. Evaluations of population status and habitat use have been initiated by USDA Forest Service, Idaho Fish and Game Department, Washington Department of Wildlife, and the University of Idaho.

The current grizzly population in the Selkirks is small, but is reproducing and seems stable. Telemetry studies reveal that several bears have home ranges entirely within the U.S. and others have home ranges overlapping into British Columbia. The fact that these two populations are contiguous and that most British Columbia populations are geographically linked is important to the survival of the U.S. population.

The distribution and range of Selkirk grizzlies today is very similar to historical accounts. Areas such as the Salmo Wilderness and the mountains north of Priest Lake hold grizzlies just as they did in 1900. Although human activity has increased over time, these areas continue to satisfy the requirements of a grizzly bear population.

Research efforts in the Selkirks started in 1983 with a trapping and habitat use study by University of Idaho student Jon Almack. One female bear was captured in 1983 and was followed for two field seasons. This was the first grizzly bear captured in Idaho.

During 1984, a separate trapping study was undertaken in Washington by the Washington Game Department. The Idaho Fish and Game Department continued trapping in Idaho and captured 5 additional grizzly bears. In 1986, a cooperative research project was started to analyze seasonal habitat use by grizzly bears.

Radio telemetry collars have been placed on 11 Selkirk grizzly bears. A total of 14 bears have been identified, 3 of which were cubs of the year. Of those 14 bears, 6 are female, 5 are male. Six of the 14 were 1.5 — 2.5 years old. Collars are no longer operating on the 5 male bears and one of the females. Three adult females and 5 cubs were followed to their dens in 1987.

Bears, except sows and young cubs, move into valley bottoms and meadows such as the Upper Priest River and Bismark Meadows to forage on grasses and sedges after they leave their dens in Spring. The sows and new cubs stay close to den sites in timbered areas, which reduces contact with predaceous boars.

In late Spring, bears move into a habitat which becomes the center of their activity until den up. The burn areas of north Idaho are used intensively and are probably the single most important of those available. Because of their diversity of habitats, the burns provide food and cover for bears throughout the year. Burns contain numerous open and wet areas that produce the tubers and forbs eaten by the bears during this period.

After berries are available, the grizzlies frequently move out of the burns to concentrations of huckleberries in other areas. Berries ripen and drop in open habitats earlier than in timber, so bears often use timber and shrubfields with good berry production in early Fall. After the berry crop declines, bears again use the burns.

Just prior to denning, bears use heavy timber. Their inactivity is a clear signal that the bears are ready to den. The earliest Selkirk denning dates observed have been in late September, and the latest at the end of November, depending upon when snows occur. Dens are located at high elevations where snow depths are greatest and provide necessary insulation during hibernation.

The Selkirk ecosystem, including that portion in British Columbia, has a recovery goal of 70 to 90 grizzly bears. The recovery will be through natural population increase and sound management practices. The official Grizzly Bear Recovery Plan, released in 1982, identified the Bitterroot Mountains as another area slated for recovery of a viable population of grizzly bears. Very little was known about the area, including its exact political boundaries, and it was given low priority relative to the other ecosystems. Boundaries have since been drawn around 3.4 million acres of land and has been named the Bitterroot Evaluation Area (BEA).

The recovery plan outlined three objectives for the BEA: (1) determine the present status of the grizzly bear population, (2) determine the space and habitat necessary to support a viable grizzly population, and (3) define the appropriate actions necessary to develop a more complete recovery plan.

The fact that a self-sustaining population of grizzly bears once occupied the area indicates that necessary habitat features were also once present. While changes may have altered the habitat, mak-

ing it less able to support grizzly bears, two recent evaluations of parts of the Bitterroot rated the areas as very good grizzly bear habitat. A new, much larger project is now under way to classify and evaluate grizzly bear habitat across the entire Bitterroot area using Landsat satellite imagery, initiated by the USDA Forest Service and the University of Idaho.

Landsats are satellites that circle the earth in circumpolar orbits and continuously measure and record the light reflected from the earth's surface. One sensor, the multi-spectral scanner, records the earth's reflectance in four wavelength bands: green (0.5-0.6 uM), red (0.6-0.6 uM), infra-red 1 (0.7-0.8 uM), and infra-red 2 (0.8-1.1 uM).

The data take the form of a digital image which can be envisioned as a huge grid over the earth's surface. Each grid cell measures 50 by 50 meters and contains the numeric values of the earth's reflectance in the four wavelength bands. Any attribute of the earth's surface that can be represented numerically, such as evaluation, aspect, slope, political boundaries, surface hydrology, and vegetation type, can be in the form of a digital image.

Vegetation types that have similar reflectance characteristics have been classified from the raw Landsat spectral data. Field sampling of selected plots correlates the spectral data. Field sampling of selected plots correlates the spectral classification with the actual vegetation existing on the ground. Refinements can be made by adding other data layers and modeling the environmental features of certain vegetation types. For example, riparian vegetation can be classified by adding a surface hydrology data layer.

All of the images are stored on computer tapes, ready for analysis. Habitat summaries can thus be easily and automatically obtained for all of the BEA or portions of it when the classification is completed. The floristic composition of each class can be examined with the field data. Such summaries and analyses will be input into models designed to evaluate the habitat quality for grizzly bears in the BEA.

The current grizzly bear recovery efforts in the Bitterroot Evaluation Area are designed to answer the basic question: Are there grizzly bears there and can it support a viable population? At the same time, a public information/education program is keeping people informed of progress and dispensing information about grizzly bears. The future of the grizzly bear in the Bitterroot Mountains rests largely on political decisions yet to be made. Only by first answering basic ecological questions and then providing the public with that information can the proper decisions be made.

**Wolves** The same applies to wolves. Currently, three recovery areas have been established in the northern Rockies, including the Glacier National Park-Bob Marshall Wilderness ecosystem, the Yellowstone ecosystem, and the Selway-Bitterroot ecosystem. However, only the Glacier-Bob Marshall area contains wolves, and that population is just beginning to establish itself in the North Fork of the Flathead River drainage. Plans are to allow a natural recovery of wolves in the area, without resorting to transplants. The policy of Idaho and Montana is to allow natural re-colonization to take place in the other areas as well. A recovery goal was set at 10 packs of 10 wolves, or 10 breeding pairs for each ecosystem. This goal was based on what is thought to be required to maintain a viable, self-sustaining population in each area.

*"Konrad contends that human psychology has much to learn from animal psychology and that there is no essential difference between the two branches of science."*

— Adolph Lorenz

However, wolves prey primarily on big game, which are in high demand in these ecosystems. Thus, knowledge is needed of the possible effects of 100 wolves on the big game in the Bob Marshall ecosystem. The U.S. Fish and Wildlife Service has contracted with the University of Idaho to provide estimates of the effect of various levels of wolf predation on mule deer and elk in the Bob Marshall ecosystem, these two species being the likely major prey for wolves. Several different models will be used to provide estimates, incorporating data obtained from Jasper National Park, Alberta and Riding Mountain Provincial Park, Manitoba. These Canadian parks contain wolf populations which prey on deer and elk.

The projections will be based upon estimates of the big game populations, including their size, sex, and age composition. Kill rates for wolves in the Canadian areas are 12 to 28 deer and elk per wolf per year, with male elk and deer selected more in the winter populations and calves and fawns preferred in summer.

Competition for elk and deer will occur between hunters and wolves to some extent in the Bob Marshall ecosystem. The projections will be designed to provide estimates of the amount of competition and thus aid in managing wolves and big game, as wolves re-establish in the large wilderness. Planning can also help provide insight into how wolves may relate to the big game in the Yellowstone and Selway, if they re-establish in these areas.

Wolves and grizzly bears provide humanity with a real test in the battle to share this earth with other creatures. These species were extirpated because they caused damage to property and, in the case of the grizzly, to humans. Even the caribou may be perceived as a threat by some, if its presence in sustaining numbers means that an economic accommodation must occur. However, as we find out more about the habitats these species need, and how to manage habitats and populations, we inevitably will discover that we can indeed accommodate our needs as well as theirs. The investigations reported here are directed at that important goal.

*Bart Butterfield is an M.S. graduate (1985) of the Department of Fish and Wildlife Resources; James Peek is professor of fish and wildlife resources; David Volson and Chris Warren are master's degree candidates in the Department of Fish and Wildlife Resources*

# Electric Hike

**by John L. Edwards**

Mist filled the air and chilled our bodies as we crawled out of our tents and started the stoves for breakfast. The sun hid behind the rocky snow-covered peaks that surrounded us. Black and white shadows engulfed the high mountain valley, the sun rose, splashing color all around. After breakfast, we packed day packs with all the necessary essentials for an outing in the high country. We proceeded toward our destination, Buffalo Mountain, a 12,777 foot peak in Colorado's Eagle's Nest Wilderness.

As we ascended up the foothills from an elevation of 9,500, our legs felt the steepness of the slopes. The group of fourteen youths climbed slower than I expected and we found ourselves at the base of the main face late in the afternoon. We began climbing the steepest section, 20 minutes from the summit, when thunderclouds began forming. It appeared we would be stuck near the summit during a storm. Thunder and lightning pounded the nearby peaks, terrifying and thrilling our group as we approached the top. Mother nature cracked and boomed as the eye of the storm moved closer and closer. Robin and Sam, now almost in tears, refused to go further. Robin, 14, from Arkansas and Sam, 15, from New Jersey comforted each other the best they could; neither of them had ever been above 3,000 feet before. I remained with them while the rest of the group proceeded on; the summit was only one-quarter of a mile further. Lightning approached, and I was happy to have given a lightning class earlier that day. I coached Robin and Sam foot by foot and soon our whole group was on top peering down on the world below us. Unfortunately, the kids hadn't listened well to my lesson, for they walked around and stood in groups talking. Ryan and Lyle were completely taken in as lightning struck only a few hundred feet away. Ryan's hair stood on end as the electric currents neutralized. I reminded everyone to spread out, crouch down, and insulate themselves from the ground. After a long fifteen minutes, the storm passed and the sun peeked through the clouds. We descended in the calm of the afternoon feeling excited and alive.

This is just one of my unforgettable experiences while working for the National Wildlife Federation's Teen Adventure. This program plays an important role in the future of our world. Modern society tends to alienate us from the earth. Our food comes from the store and our heat from the furnace. Programs like Teen Adventure open a new door of understanding to teens about our earth. One of the major objectives of the program is to help teens understand that the earth is a part of us; our source of life, not a resource to abuse. The future of our world depends on a renewal of the relationship between the earth and humans. If air and water pollution, deforestation and wasteful use of the earth's resources continue, humankind may watch itself disappear from the planet. Educating today's youth about the effects of our everyday life on the environment and renewing their relationship with the earth through first-hand experience in the wilderness can have lasting impacts on the decisions of tomorrow's leaders and citizens.

I see an exciting and rewarding career for those of us in the natural resource fields. Environmental education, coupled with outdoor adventure, is an effective way to help all people, not just youths, open their minds to a closer relationship with the earth. As the global state of the environment deteriorates, environmental education becomes a vital tool to change ideals, attitudes and lifestyles. With an increased need for environmental education comes an increased number of jobs for those of us in natural resources. The challenge of this work excites me, and I hope it excites my fellow students. I plan to pursue a career in the field of outdoor recreation leadership. Hopefully I'll have a positive effect, however small, on the world's future. If each does his or her part, together we can ensure a future for generations to come.

*John L. Edwards is a senior in Wildland Recreation Management.*

# "LEARN TODAY . . . TO LEAD TOMORROW" A CENTENNIAL VIEW OF FWR TRADITIONS

**by John C. Hendee, Dean**

1989 marks the 100th birthday of the University of Idaho and the 80th birthday of the College of Forestry, Wildlife and Range Sciences. The College of FWR has the distinction of being one of the oldest forestry schools in the country. We began as the Department of Forestry in the College of Agriculture and since then we have become a separate college, and changed names three times, keeping pace with the evolution of resource management. During the past 80 years, a few traditions have evolved that define who we are as a College.

## A TRADITION OF HANDS-ON TRAINING:

During the early days of our College, students hiked to Moscow Mountain for hands-on field training. They practiced surveying, timber cruising, log scaling and logging road location and design. In the early 1940's summer experiences included hands-on field training at the McCall Summer Camp, where students learned to work together in crews, to perform routine forestry-related field duties, to fight fire and to solve the field problems that they would someday encounter as natural resource professionals.

Today hands-on field training continues as an FWR tradition — as vital today as it was nearly 50 years ago. Our students still go to Moscow Mountain for hands-on training, but transported by vehicle now and pursuing their studies on our own 7500-acre experimental forest. The College presently has the distinction of being the only Professional forestry school in the nation with a full complement of student field crews. These crews carry out much of the work on the forest, including planning, silvicultural prescription writing, road surveying and building, logging, slash disposal, prescribed burning and tree planting. Our student logging crew was recently featured in a "John Deere on campus" nationwide advertisement as "the best educated logging crew in the country." We continue to offer a 6 week summer camp at McCall even though many forestry schools have terminated such hands-on educational programs.

This tradition of hands-on training has helped our graduates succeed. Vandal foresters are as comfortable in the woods as they are working with computers or negotiating with the publics they serve. Our hands-on approach, complementing our "hi-tech" and "hi-touch" classroom training, is just as important today, and will remain so for the future, especially for the many urban youth now attracted to natural resource careers.

## A TRADITION OF LEADERSHIP:

An amazingly high proportion of FWR graduates have risen to leadership positions in their careers. This confirms what we've been told — that Idaho graduates are noted for achievement and the leadership responsibilities to which they evolve. This tradition of leadership has been true for decades, and our alumni include many who shaped and are shaping natural resource management. Their titles are indicative, for example in the Forest Service: Experiment Station Directors Joe Pechanec, Class of '32; and Roger Bay, Class of '53; Deputy Chief for Research, George Jemison, Class of '31; and Associate Deputy Chief, Bob Harris, Class of '41; Regional Foresters Charlie Connaughton, Class of '28; and recently appointed Pacific Southwest Regional Forester Paul Barker, Class of '58.

State Foresters include Tom Tagawa in Hawaii, Class of '54; Roger Guernsey, Class of '47, Idaho's first State Forester who served us for 20 years. BLM State Directors include Delmar Vail, Class of '53; Dale Andrus, Class of '53; Charles Luscher, Class of '54; and Bill Leavell, Class of '52.

To forest industry we have sent Bruce Colwell, Class of '50, Vice President of Diamond International; and Art Nelson, Class of '38, Vice President of Champion International.

To educational institutions FWR has sent many leaders including, Gerry Thomas, Class of '41, President Emeritus of Mexico State University, Ben Jayne Class of '52, who became Dean of the School of Forestry and Environmental Studies, Duke University; and John Hunt Class of '52, distinguished professor of Tourism at the University of Massachusetts; and many others.

From our tradition of leadership FWR has gained an international reputation as well. Presently there are students from more than 25 countries in our College, enriching and diversifying our classrooms and expanding our influence worldwide. Our alumni number dozens in many countries such as China, Honduras, Korea and Taiwan, with numbers building in other world regions such as South America, Northern Africa and Southeast Asia. Many of these graduates have become leaders in their countries, for example, Dr. Ruben Guevara, who after completing his doctorate at our College in 1982, and an MBA at Harvard, is Dean of ESNASCIFOR the leading Forestry School in Honduras and Froylan Castaneda, who received his Ph.D from FWR in '85, is the former chairman of the Forestry Department at the University of Honduras, and is now head of a USAID project to upgrade forestry education in Bangladesh. Another graduate of FWR achieving international recognition is Jack Sullivan Class of '52, Director of Forestry and Environmental Programs for USAID.

Many of our graduates have succeeded in fields far removed from their FWR training, the best known being Ambassador Phil Habib, Class of '42. Others include Gene Gray, Class of '64, a successful life insurance salesman in Payette, Idaho; Mike Roach, Vice President and auditor of First Security Bank in Boise, Idaho; and Jim Risch, attorney and President Pro Tem of the Idaho Senate. Many other alumni are also leaders in education, business, the military and government. The success of our graduates in non-natural resource fields is particularly heartwarming to those of us who wish more citizen leaders understood natural resources.

Any list risks oversight of equally deserving people and the above names are illustrative only, but they do confirm the FWR tradition of leadership.

## A TRADITION OF BALANCE:

Merely living in Idaho exposes one to continual dialogue about balance and tradeoffs in natural resource use. All students must learn to appreciate the views of diverse groups and individuals that place demands on natural resources, and the multiple-use approaches necessary to accommodate them.

FWR is unusual in having six natural resource programs under one roof. An ecological approach is emphasized, based on the assumption that ecological processes determine the shape of the natural world, and that only a "process approach" can prepare our students to deal with rapidly changing management applications. Ecological understandings are the basis for resource management for whatever purpose or balance of uses.

But over the years, the search for balance has come to require more than just broad ecological understandings. New curricula teaching "high-tech" and "hi-touch" skills are now required. Computer literacy is as important to our graduates today as were familiarity with diamond hitches, splitting mauls and "misery whips" in the early years. Likewise, interpersonal skills, even in natural resource professions which once drew recruits seeking escape from people, are now essential. Dealing with people is now our greatest challenge. So the tradition of multiple-use understandings and an ecosystems approach, continues today in our College but with "high-tech" computer training and "high-touch" interpersonal, conflict resolution and negotiating skills.

## A TRADITION OF SELF HELP:

Our students most often come from families of modest means and these young people are distinguished in their determination to complete their education despite financial obstacles. Our graduates and many friends of the College also share a strong concern for shaping tomorrow's natural resource leaders and express that concern with welcome advice and support toward improving the College. Many of our graduates serve on the College Guidance Council or are active participants in the FWR Alumni Association. Such involvement provides vital support and epitomizes the Centennial theme of "tradition meeting the future". The "can do" attitude of our students, graduates and friends of the College reflects the tradition of self help.

At the "Class of 42" reunion last year some of the stories of

The best of all things is to learn. Money can be lost or stolen, health and strength may fail, but what you have committed to your mind is yours forever.

— Louis L'Amour

economic hardship and self help were truly inspiring — and even amazing to some current students. For example, Phil Habib's undergraduate career in 4 pairs of pants—one per year with replacement after the summer field season. Phil also described economic hardship so great that $18.00 per month for room and board at the Idaho Club (now the site of the FWR building) had to be forgone for a $5.00 per month room with a bed for two, above a Chinese restaurant, with meals downstairs in exchange for dishwashing.

Financial support from our alumni and friends is another expression of this self help tradition, evidenced by the 27 separate endowments supporting scholarships for our students. During (FY '87), 224 donations totalling $65,610 were received from you for investment in these endowments—which honor past faculty, alumni, students and friends. Most of these endowments are not large and they reflect a "giving what we can" ethic and an understanding, born of the self help tradition. To fully appreciate just how important such financial help is, consider a few of the CFWR student scholarship receipients for '87-88.

Peggy Stephenson, senior in forest resources from Horshoe Bend, Idaho, chose CFWR based on our reputation. Helping Peggy through her senior year is a $500.00 Agnes M. Kelly Scholarship — established by Ward and Alice Munson in memory of Mrs. Munson's mother, a north Idaho pioneer and advocate of perpetuating the forests.

Dave Budeau from Sheridan, Oregon, a master's degree candidate in wildlife resources. Dave is studying the ecology and behavior

of pre-nesting white-fronted geese on the Yukon-Kuskokwin Delta in Alaska. Dave spends summers in Alaska performing field work as part of a cooperative research project between CFWR and the USF&W Service and takes course work at UI during the spring and fall semesters. Dave is able to work on this project and pursue graduate study because of the $6,000.00 Curt Berklund Research Assistantship that he receives. This assistantship is sponsored by Curt Berklund, former director of BLM and recipient of an honorary PhD (1977) from the University of Idaho.

Jeff Knudson, from a ranch near Mountain Home, Idaho, is a sophomore in wildland recreation and is a recipient of a $500.00 75th Anniversary Scholarship, which many of you made possible through your contributions to this fund. This scholarship has paid for Jeff's registration and textbooks and enabled him to continue his education full-time without having to take off a year to earn money.

Our future, your future and the nation's and world's future depends more now than ever on the wise stewardship of natural resources. Learning to be wise stewards begins with undergraduate students in Colleges such as ours. Our goal must be to retain, recruit and educate the finest young people in the world for natural resource careers. From our past record of success we know that some of our nation's future natural resource leaders are already here "learning today . . . to lead tomorrow" and that we are doing the best we can with financial aid to help them complete their education for their future and ours.

## TRADITION LEADS THE FUTURE

As "traditions meet the future" in the University's Centennial and FWR's 80th year, we need to celebrate our College traditions and their origins. These traditions speak to enduring values that set us apart from other schools and help contribute to the success of our graduates. The traditions of hands-on training, leadership, self help and a balanced view will continue to shape FWR's influence in natural resources. These traditions have evolved over the past 80 years and must continue to be a prominent influence on FWR as our current students "learn today to be leaders tomorrow".

# Value in Idaho's Forest Industry

**By Governor Cecil D. Andrus**

For over a century, the forest industry has played a major role in Idaho's economy. In the early days, the virgin forests provided the logs that yearly flowed downriver to feed the sawmills. Logging and milling in those days were straightforward operations. The felled logs were skidded to the rivers, floated downstream to the mills, and eventually emerged as dimensional lumber. Those great log drives were picturesque, and tough–on men and animals. I know, I participated in some of the last of them.

It seemed, in those days, as if Idaho's timber supply were infinitely bountiful, that we could never run out of timber.

Today, most of the virgin forests are gone; rivers that carried logs are blocked by dams; the logger is still tough, still felling trees, still wearing caulked boots, but, for the most part, the logging camps are gone, and after a day's work, he drives home to his family. Today, for better or worse, the log drives and the hard-living 'timber beasts' are picturesque anachronisms.

And increasingly anachronistic, too, are the mills they supplied. The age of superabundance has passed, really never existed. We live today with a fixed timber supply, yet we need an increased timber income. We can't get it by feeding logs into one end of the mill and pulling lumber out the other or by exporting logs to run mills offshore. We have to increase the value of Idaho's forests to Idaho.

That may sound contradictory, given a fixed timber supply. But it really isn't contradictory at all. One analogy for what I'm talking about is the petroleum refinery. It doesn't produce just one product, say lubricating oil. It passes some of the raw material, petroleum, along lines of greater refinement, from lubricants to kerosene, to gasoline, to special solvents, to a spectrum of chemicals. Each step along the line adds value to the raw material.

Obviously, the analogy breaks down when applied to the timber industry. No single mill can operate like a refinery. But we can extend the timber refinement line within the state, where it is economically feasible: from logs to lumber to dry lumber to graded products, to remanufacturing into cut stock to engineered wood products or a variety of other products. Too often in Idaho the refinement line is prematurely and unnecessarily broken; and the value added is, unfortunately for jobs and the state's economy, added out of state.

Certainly we find product diversity in Idaho's forest industries: waferboard, particleboard, pulp and paper, tissue paper, plywood, and more. Champion International, in Salmon, produces glued laminate beams; Browning Cut Stock, in Juliaetta, manufactures among other things, window sash assembly parts for Andersen's Windows and small wooden blocks for the PLAYSKOOL people. Trus-Joist, in Boise, produces wooden I-beams and other engineered wood products.

Important as it is, however, diversity of products is just one element of the three-dimensioned value-added equation. A second is the development and application of new technologies and methods that decrease production costs, whether in primary processing or in secondary manufacturing processes. Of course, the most obvious of these is the computer, from computer controlled saws to computer monitored quality control. But we can also find value—added technologies in improved wood drying processes or in new techniques such as log sorting in the woods.

The third element in the value-added equation is the seeking out and developing of new markets for Idaho forest products. I've already touched on some specialty items produced for specific, limited markets — glued laminates, cut stock, and others. But forest industries have also begun seeking new general markets. Increasingly, for example, some forest industries have begun to focus away from residential construction — a traditional end-use

market - and are looking instead to the lucrative home remodeling/repair market. Instead of manufacturing only dimensional lumber for sale to lumberyards, many mills have begun to produce specialty products that are distributed through the giant home center chains - Ernst's, Wal-Mart, and others, and the new breed of "super stores."

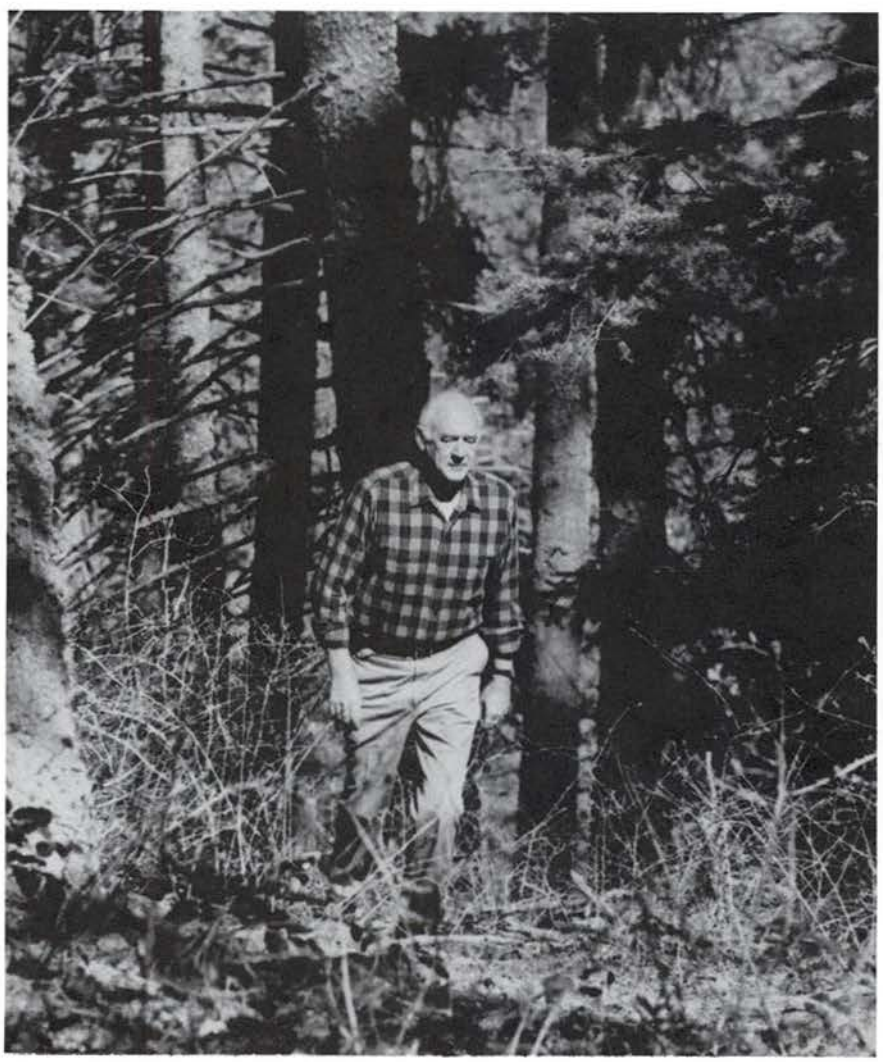
Here we might pause for a "tip of the hat" to the Western Wood Products Association and its imaginative marketing programs.

An obvious advantage to such markets is that they are far less volatile, far less susceptible to the 'boom and bust' cycles that characterize residential construction, and thus the forest industries.

Obviously, not all of Idaho's forest products other than lumber or plywood can or should be remanufactured within the state. Idaho will continue to export lumber and plywood out of the state. But to the extent that remanufacturing and other value-added processes are feasible, they should be applied.

These are good beginnings — but only beginnings. Clearly, the challenge to the Idaho forest industry and to Idaho forestry education and research is to build from them. We must continue to develop new technologies that reduce production costs; new markets that offer new profits and an increased measure of stability.

Sure, I miss the earlier days. Physically demanding as they were, those log drives down the Clearwater were certainly exciting, and both logging and milling seemed simpler then, less complex in many ways. The supply seemed unending, the markets clear and stable. But time brings change, and change requires adaptation. For Idaho's forest industries, successful adaptation lies in the active exercise of value-added technologies, processes, and strategies. They'll not only add value to Idaho forest products, they'll add jobs for Idahoans.



# Idaho's "Community" Forests

**by Craig Foss**

If you would like to increase the value of your property, decrease winter heating bills, and keep cool in summer, the answer is simple. Become "tree smart." That is what urban forestry is all about.

Urban or "community" forestry is a concept that has benefits for everyone, regardless of whether or not we have trees on our property. The community forest is composed of all public and private trees, though it is the trees in our parks and along our streets with which a community is most often concerned.

Trees serve many purposes for a community. They cool our homes in summer, help reduce heating bills in winter, exchange carbon dioxide for life-giving oxygen, filter pollutants from the air, house a variety of bird species, and increase property values as much as 20 percent. They do all these things while providing shade and beauty for everyone to enjoy!

However, most cities — large and small — do not have the funds to care for their trees. In many communities, the homeowner is responsible for caring for street trees on property right-of-ways. Lack of tree care knowledge often results in inadequate spacing between planting, lack of plant variety, improper or lack of pruning, and overall inadequate tree care.

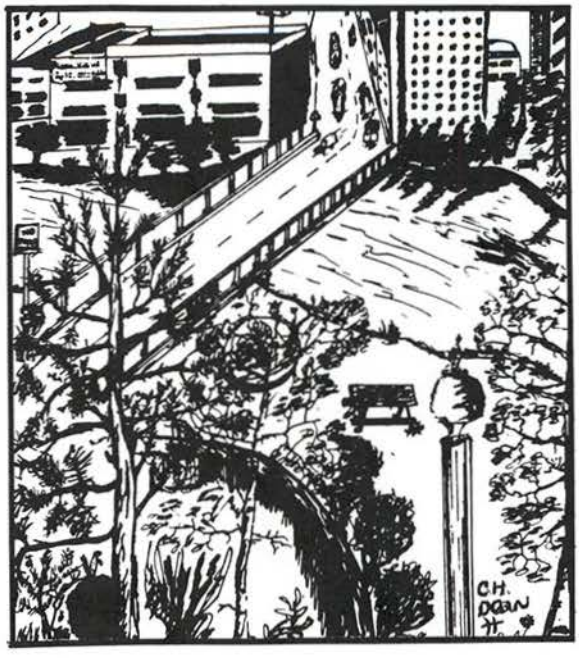
How can we encourage proper tree care? Concerned citizens must be the driving force! Organizing concerned citizens into a Shade Tree Committee is the first step. Responsibilities of this group might include:

— Sponsoring public education concerning tree care: recommending certain tree varieties for particular areas, various tree planting methods, proper tree pruning methods, factors to consider when selecting a tree care service, and overall community beautification.
— Organization of community projects such as Arbor Day programs, tree care workshops, and tree planting programs such as donate-a-tree, adopt-a-tree, and living tree memorials.

Committee members should have a strong interest in the future of the community. The most successful Shade Tree Committees represent a wide variety of citizen interests and community groups. The advantage of a committee is that citizens become "tree smart" at little or no cost to city government. Committee members serve on a volunteer basis and can receive technical assistance through the State Cooperative Extension Service and through the excellent literature available from a variety of sources.

Although the concept originated in populated urban areas of the eastern states, community forestry is not new to Idaho. Coeur d' Alene, Lewiston, Mountain Home, and Moscow presently have Shade Tree Committees. Boise and Caldwell have full-time urban foresters within their Parks Departments, and along with Coeur d'Alene, have achieved "Tree City U.S.A." status. Coeur d'Alene, just last year.

The next time you go for a walk or drive, take a look at your community forest. The trees were likely planted by someone concerned with making your community a better place to live. Taking care of our community trees today will help ensure a more desireable environment for tomorrow. The end result can be a healthy, diverse, and attractive community forest . . . and satisfied citizens.



*Craig Foss is a student in Forest Resources.*

# STRATEGIC FOREST DEFENSE INITIATIVE

**by Joseph J. Ulliman**

Can foresters prevent war? Why not! Some may say we cannot save our environment, let alone undertake other grandiose adventures. But why not!

One of our alumni has developed a "Natural Solution" for defusing confrontation between NATO and the WARSAW Pact, a design for the defense of Western Europe and potential deterrent to any thought of war in the first instance. Mr. William M. Tilton, B.S. Forestry 1961, and now retired Lieutenant Colonel of Armor, U.S. Army, conceived the idea while assigned to a NATO staff developing polices and defense plans.

The solution — a forest belt, 20 kilometers wide, extending from the Baltic Sea, approximately 1800 kilometers along the East German, Czechoslovakian, and Austrian borders to the Alps near Berchtesgaden, Germany, and Salzburg, Austria. The plan would take advantage of already existing barriers: 550 kilometers of forest, 400 kilometers of rivers and approximately 325 towns.

What a wild idea! Most "pooh-pooh" it without much thought; I did. On further analysis though, I and most others dissecting the details subsequently embrace the idea with some enthusiasm after considering the alternatives: the present situation in Central Europe; nuclear war; SDI (Strategic Defense Initiative) — so called Star Wars. So what does this eccentric proposition have to offer?

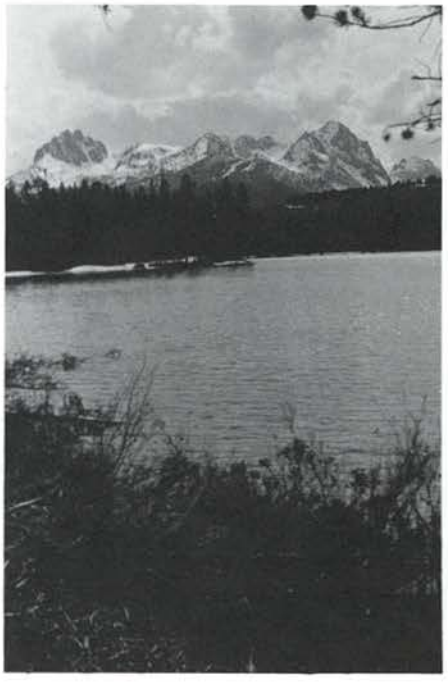
We believe the forest belt concept, rather than being a mundane anachronism, is a conceivable notion worth investigation. Why? For several reasons:

1. The major benefit would be in terms of defense and deterrence. The Warsaw Pact's recognized major strategy is a massive high speed mechanized surprise attack of the western forces. A 20 kilometer forest would prevent both the surprise and the massive high speed mechanized attack by tanks and armored vehicles. The Huertgen Forest experience of World War II sets some precedence for this. Some believe that the Warsaw Pact could burn the forest, "nuke it," go under or over it. The Maginot Line didn't work either! Many military strategists, though, believe the destruction of a forest by any means, or the vaulting of it by mobile airborne troops, without great merit. The Maginot Line was actually flanked rather than penetrated.

   But a forest takes time to grow! Yes, it would take 6-8 years for the trees to grow tall enough to provide screening of the fire control sights on armored vehicles, 10 to 12 years to prevent effective turret rotations, and 20 years or more to reach the 10-inch DBH that would stop a tank. The latter is about the same period of time it takes to develop and emplace major state-of-the-art weapons systems. The Warsaw Pact could attack now, before full development of the forest! Yes, they could do so even now, to their possible benefit and our detriment, without the aid of a forest belt.

   The greatest advantage of the forest belt would be deterrence. If the Warsaw Pact cannot surprise the NATO forces, then why try? In fact, if the Soviets are serious about their peaceful intentions and have no taste for attacking the West, they may wish to implement one half of this forest belt on their side of the border, eliminating the fence and taking advantage of the benefits of a forest.

2. There are economic benefits to the forest belt — it would yield a return on investment, quite a contrast to major weapons systems. Managed on



*There may be times when we are powerless to prevent injustice, but there must never be a time when we fail to protest.*

— Elie Wiesel

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a sustained yield basis, it could provide income and forest products to Germany, now an importer of wood products. Initial costs would be considerable but not more than new weapons systems. Millions of hectares of land must be converted from agriculture to forest land and the tradition of farmers may be against it. This is a consideration needing further study but subsidy and incentive programs may be a partial solution.

3. We could call this forest a "green belt," for it could provide environmentally desirable factors such as: a filter for pollution; a provider of $CO_2$; a place for recreation (forests are esteemed places in the German culture); a place for wildlife; protection for the watershed.

4. Politically, the concept represents opportunity for a peaceful solution to tensions on both sides. The placement of a forest is clearly nonescalatory. It could be an obvious signal to the Warsaw Pact that NATO truly has no designs on their territory. In contrast to the Berlin Wall and the present fence between East and West Germany, it would represent no barrier to normal intercourse and could be the basis for cooperation on a problem that affects both sides, Waldsterben. Rapprochement with the East would still be possible.

The forest would not deny to people the use of land as other barrier systems such as fences, walls, pre-positioned mines and atomic demolitions do, rather it would be the foundation for multiple use of land.

Such a forest belt represents a European solution to a European problem within the budgets of the European countries. It would reduce the reliance on the United States.

NATO is looking for unusual solutions to the problem of defense and definitely something different from the dilemma they are in today.
In a *Wall Street Journal* article "NATO Quandary" (11 June 1987) it was so stated, "In matters of war and peace, the North Atlantic Treaty Organization is looking for a few new ideas. With the latest missle treaty and continuing trend in reduction of nuclear arms, many fear that the conventional arms imbalance could become more dangerous. Soviet-bloc advantages in conventional arms will loom even more menacing after the missles go, yet the West has no plan to spend more on conventional arms or to negotiate cuts in such arms. In its search for new defense and arms control strategies, the Western alliance is stumbling badly."

There are other advantages and limitations not discussed here but left to detailed investigation under our proposal to a number of funding foundations. Some of these include the United States Institute for Peace, the Carnegie Endowment for International Peace, the Ford Foundation, the Weyerhaeuser Foundation, the New World Foundation, the Rockefeller Foundation, and about 25 other foundations for conderation. We have proposed to them that the College of Forestry, Wildlife and Range Sciences, University of Idaho pursue this idea in the following stages.

1. Conduct a working conference of German and U.S. forestry experts at the University of Idaho to detail the technical feasibility of putting in such a forest. Of course there are many considerations, some of which we are completely unaware of at this time. A feasibility report would be the result of this conference and if positive we would proceed to stage 2:

2. Transact a second conference, sponsored by a German forestry agency in West Germany to examine in more detail the social, economic, political and military aspects of the endeavor and further resolve the technical forestry questions.

3. Write a detailed position paper on the concept to be distributed to the political and military personnel and groups in all NATO countries. If the concept is possible and there is enough favorable response, then we could promote the idea to the fullest extent.

Why not! Isn't it time we put our disciplinary training to a higher use? Isn't it time we tried a peaceful, economically and environmentally sound means to obtain peace.

*Joseph Ulliman is a professor specializing in remote sensing in the Department of Forest Resources.*

# PLANTING A WILDLIFE SEED

**By David D. Musil**

When most people think of planting they think of their gardens with tomato seeds or flowerbeds with tulip bulbs. But in the high elevation Sawtooth Valley of central Idaho, the planting is being done with sage grouse.

Historically, the Sawtooth Valley supported a healthy population of wild sage grouse. During the 1800's, miners harvested buckboard loads of these unique western birds for tasty winter meals. Birds were plentiful during the 1960's, but recently, the sage grouse population in the isolated valley took a nosedive.

The cause of the decline is unknown, but may be linked with a combination of several factors. The valley experienced a severe winter in 1976 with extremely cold temperatures and little snow cover. Certain areas of the Sawtooth Valley suffered a winter-kill of sagebrush, the plant for which these grouse are named. This is the most precious plant to the sage grouse because they rely on it for a majority of their diet and shelter, especially during the winter. The valley has also had a history of heavy sheep grazing and conversion of lowlands to grass pastures. These factors, combined with possible inbreeding, disease, and natural mortality may have been too much for the sage grouse population to sustain high numbers.

Given proper conditions, upland game birds will normally bounce back from low levels and increase naturally. But even after the hunting season was closed and the winter-killed and overgrazed areas of sagebrush in the Sawtooth

Dave Musil

An adult male sage grouse with a solar powered radio transmitter. The transmitter is attached to a strong vinyl collar or "poncho". The entire package weighs less than 25 grams.

Valley grew back, the sage grouse numbers did not increase but continued to decline. Something had to be done before the population became extinct.

The Idaho Department of Fish and Game (IDFG), in cooperation with the U. S. Forest Service, decided to capture wild sage grouse from areas in eastern Idaho, where the birds were abundant, and transplant some of them into the Sawtooth Valley. During the spring of 1986 and the spring of 1987, the birds were captured at night with hand nets and high-powered spotlights. Transplanting native upland game birds is quite common, especially with wild turkey and ruffed grouse in the eastern states. However, the last time anyone reported transplanting sage grouse was in the 1950's in Wyoming, and the released birds were not intensively monitored.

As research progressed, several important questions demanded attention. Would the transplanted sage grouse stay in the Sawtooth Valley or would they scatter and try to find their way home? Would they become oriented in their new home and survive? And the most critical question, would they mate and produce young to enhance the valley's low population? To sum it up, would this wildlife seed take hold and grow?

We are attempting to answer these important questions by fitting a sample of the transplanted birds with radio transmitters. We placed the small solar-powered radios on 44 of the 196 transplanted grouse. During the first few months, the birds scattered throughout the 186 km² valley, sometimes moving 11 km in one day. The birds may have been looking for familiar landmarks used in their original home areas to orient themselves. Eventually, the birds became accustomed to the valley and concentrated their movements within 5 km of the release site.

During this early period, 30% of the radio-marked birds died. Possibly the stress induced by capture, transport, or being in a new home were too much for some birds and they became easy prey to coyotes and eagles. Once the birds made it through this critical period, the chances of survival were much higher. At least 43% of the radio-marked birds survived the first few months and remained in the valley. If the group of radio-marked birds is representative of all the birds released, then there should be around 84 transplanted sage grouse in the valley.

Through our research, we located 3 new centers of mating activity, or leks, used by the transplanted grouse. Male sage grouse normally gather on leks during the spring to attract females by performing an elaborate display called "strutting." It is important to identify leks because they are very traditional in their locations and are the hub of yearly activity. Sage grouse are known to use the habitat within 3 km of a lek throughout the year for nesting and wintering. Guidelines for proper sage grouse management recommend little sagebrush removal around leks.

Along with the leks, we located 7 nests of transplanted hens within 5 km of the release point. Eggs in three of these nests successfully hatched and we also observed other transplanted hens with broods. Hens normally lay 7-9 eggs and incubation lasts 27 days. A few weeks after hatching, young sage grouse are able to fly short distances.

My master's research project with the University of Idaho's Department of Fish and Wildlife Resources involves monitoring the movement, survival, reproduction and habitat use of radio-marked birds. My work is supervised by UI Professor Kerry Reese and IDFG research biologist Dr. Jack Connelly. Information gained from this project will be a valuable contribution to our knowledge of transplanting sage grouse for future restocking efforts elsewhere.

It is too soon to determine if our sage grouse transplant is a complete success. It is important for the offspring of the birds we transplanted to survive and produce young. But the information we have gathered so far does paint a hopeful picture for the sage grouse in the Sawtooth Valley. The wildlife seed we planted has taken hold and now needs time to grow in the heart of Idaho.

*Dave Musil, a wildlife graduate student at the University of Idaho, hopes to complete his thesis this spring.*

# Herb and the Spoon

**by Dan Dallas**

Herb is a cowboy. Herb is not the five hundred dollar boa-skin boot, mud flaps on the jacked-up Ford, drug store variety cowboy. Herb is an old-fashioned, jump on the horse before daybreak, ride through the hot sun or freezing cold and chase cows all day, shoe his own horse variety cowboy. Herb is a throwback to an earlier time, a dying breed.

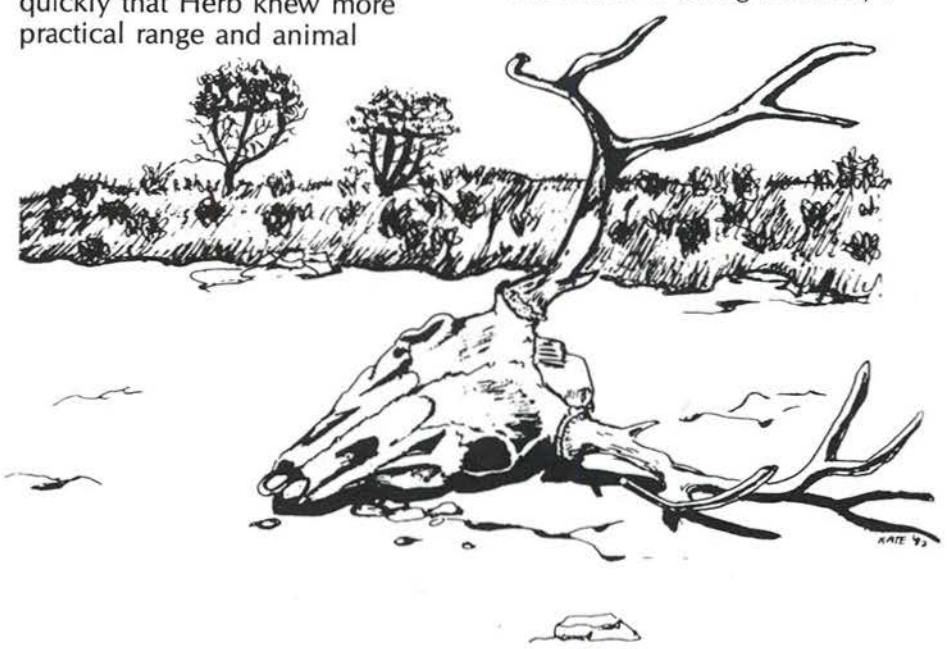
You don't just meet Herb, you experience him. Herb fits into the archetypical cowboy image. He has the weather-beaten features, and the bowlegged walk from years of riding a horse. He stutters when he speaks and never is without a Camel stud hanging out of the corner of his mouth. He told me once, he took up smoking Camel studs because they were easier than rolling his own when on horseback, c-c-coffin nails he called them. Herb is a character in country that seems to breed a lot of characters, the Owyhee desert country in southwestern Idaho, northern Nevada, and southeastern Oregon.

I first met Herb when I accepted a job as a range technician on a study project in Owyhee County. Herb was the cowboy for the cattle company whose cattle were the subject of the study. Part of the study involved the determination of the cattle's diets, requiring that samples from their fecal masses be collected at intervals throughout the study. This made me the butt of much good-natured humor by my co-workers and family.

After being informed of who I was and what I would be doing in the study, Herb quite naturally wondered how I was going to figure out what those cows had been eating. When I launched into an explanation of how this was to be accomplished Herb stayed interested until I outlined the sampling procedures. When I got to the sampling procedures he fell into one of the wildest laughing fits I have ever seen. He almost lost his Camel stud and his upper plate, he was laughing so hard. Thereafter, Herb absolutely delighted in needling me about this "scientific" aspect of the study. Someone asked me in Herb's presence one time what I did in the study. Before I could answer, Herb piped up and volunteered for me "he picks up c-c-cow p-pies."

Although leery of him at first, I came to enjoy being around Herb and I think he came to enjoy having me around. I realized quickly that Herb knew more practical range and animal management than I could ever hope to learn in my lifetime. There is a lot that school can teach a person, but there is a lot to be learned from someone who has been through the school of hard knocks. Herb told me once he had been a cowhand since he graduated from high school in 1945. I spent a lot of time sitting around the line listening to Herb relate stories about practical ways to manage range, doctor a cow, and many of the other things that a cowboy needs to know to ply his trade. He insisted that the cows had individual personalities just like people and that's what kept him from getting lonely in his sometimes isolated job.

Besides being an attentive audience for his stories, I think part of the reason I came to get along with Herb so well is that I took his good-natured needling without getting defensive. Not someone who takes to being outdone, I



Humor is the affectionate communication of insight.

— Leo Rosten

usually tried to dish out an equal amount of kidding in Herb's direction. This leads me to the reason for the title of this story and how I came to have the last laugh on Herb.

There are places in the Owyhee country where you can see for miles. Even in the hills where you can't always see for miles you can usually tell if someone is coming or going because of the dust plumes kicked up by wheels on the miles of unpaved roads in that country. Herb often rode miles out from his pickup or his line cabin, so he was not in the habit of carrying his lunch with him on a horse. After I began working down in that country Herb soon learned that I carried my lunch with me in my pickup, as well as a five gallon jug of ice water. It soon became a habit with Herb to watch for my dust plume in the distance and come my way for a cold drink of water, or part of my lunch. I must admit that sometimes I went out to find Herb with this method at times, but more often than not Herb found me. Herb and I had some lively discussions over a drink of water, or while sharing my lunch.

As time went by Herb came to have this uncanny ability to show up where I was working just at lunch time. I didn't mind too much, I just learned to pack a little extra in my lunch cooler. As time went by Herb began to help himself to my lunch. I really didn't mind this because he always left plenty for me. What I did mind was that this became sort of a standing joke between us. As I mentioned previously, I am not one who takes being outdone lightly. As the time approached for my job to end, I began to think of ways to get even with Herb for appropriating part of my lunch those many times out in the middle of the desert.

By the time my last day came for sampling on the range, I still had not come up with a suitable means to even up with Herb for partaking of my lunches for the past year. As it turned out, Herb gave me the last laugh in this matter and didn't even realize what he had done.

On my last day working on the range, I had to walk far away from my pickup. As noontime approached I spotted a dust plume coming my way over on the horizon. I just smiled and resigned myself to having half a lunch when I got back. I think Herb knew this was my last sampling trip so he probably went out of his way to be there at noon. When I finished what I was doing I began to walk back towards my pickup. As I got closer, I could see Herb sitting on the tailgate with my lunch box open. When I reached the truck I greeted Herb just like normal. I could see he was feeling pretty smug, having beat me to my lunch on my last day. He just sat there eating my cantaloupe with the only spoon in the lunch box.

Feeling a little mean-spirited for having been outdone by Herb, I started to give him a hard time about using the only clean spoon in my lunch box. Not to worry, cautioned Herb, he had grabbed the spoon from the ash tray in my pickup, washed it off with the ice water and shined it up on his pant leg. So he allowed that my lunch box spoon was still clean and went on eating my cantaloupe and looking smug. I thought about this for a moment, laughed to myself and silently thanked Herb for giving me the last laugh. Apparently, it never occurred to Herb how I picked up those cowpie samples he so delighted in teasing me about all summer.

*Dan Dallas, (B.S., M.S. RangeResources, '84, '87)*

# Did We Ask the Right Questions in Idaho Timber Supply Studies?

by Charley McKetta

Timber supply studies are usually prompted by fears of resource exhaustion and the socio-economic consequences. Seven western states, including Idaho, are now modeling through the peak of an anxiety cycle which was motivated by two factors.

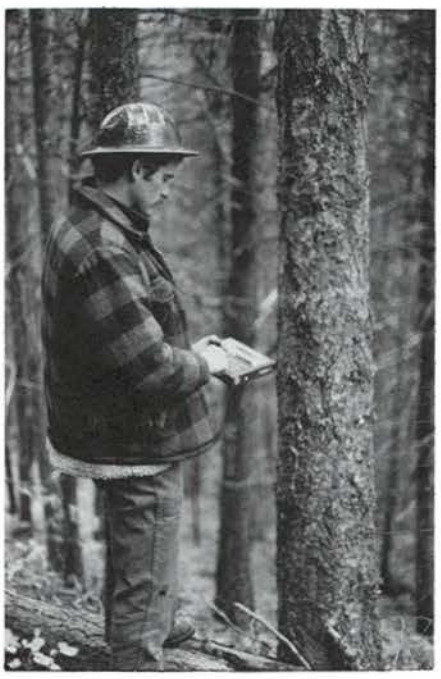
The U.S. Forest Service dominates commercial forest area (53%) and softwood sawtimber inventories (63%) in the West, but is reducing its timber orientation. Their annual harvests have been declining from a 1973 peak (USDA-FS 1967-86) and new forest plans promise little improvement. Industrial ownerships are continuing four decades of inventory reduction (USDA-FS 1982) and in most areas these forests cannot maintain current harvest levels.

The Idaho Timber Supply Study (LeVere et al. 1987) predicts a North Idaho timber shortfall of 8% for the next 20 years. It is more bleak for the South where a reduction of 14% for 50 years is mostly concentrated in the West Central Idaho Highlands. Although this biological growth projection technique ignored economic factors, particularly prices and responses to prices, changes appear inevitable for Idaho forestry.

Foresters are growth and inventory oriented because that's what they can understand and manipulate. So foresters are tempted to distill a broad set of issues into one question that may be addressed with a familiar tool. Growth projections appear to answer the big question: "Can we keep cutting like we have been?" Spotting potential timber availability gaps is a start, but maybe the answer is flawed and perhaps this wasn't actually the big question.

In 1910, Gifford Pinchot divided national timber inventories by annual drains to predict a U.S. timber omega within a generation. First, his obvious prediction failure was due less to the conservation measures he was justifying, than faulty projection logic. Predictions of human resource use are not likely to succeed when human behavior is ignored. Second, he appears to have been motivated by "blighting effects . . . felt in every household in the land". Yet, it is illogical to expect societal answers from silvicultural questions.

The real questions are so much broader that long-run biological timber projection is the wrong hammer for some of the nails. There are fundamental differences in what people want to know about timber supplies and implied timber sector changes.



Tree farmers want to know future markets and lower the risk of silvicultural and financial commitments. As timber production is flexible, they use short-run predictions of economic fluctuations, cycles and trends to adjust rates of harvest and investment.

Larger growers also want gauges of their influences on local markets for stumpage, logs, and labor, whether they wish to exert this power or mitigate it. In Idaho, individual National Forests clearly affect local conditions and collectively, a uniform Forest Service policy dominates regional (or even national) availability of all the forest's products.

Wood users constantly need product specific short-run economic data to maintain raw material balances in a fluctuating economy, and longer-range insights to evaluate plant sites and technological investments. There is minimal need for information beyond the depreciation period of capital intensive facilities. Since wood users range from firewood cutters to paper mills, the futures information that they require varies enormously.

Other forest interests, diverse groups who either consume nontimber products, or suffer negative externalities of timber harvesting, require a near-term premonition of timber related activity to adjust their actions. Timber-oriented analyses fail to capture the effect of timber decisions on the availability of other forest outputs or the

importance of non-timber activities in resource based economies.

People indirectly affected by changes in the forest economy, e.g. in timber dependent communities, benefit from advance notice of near-term changes to either lower transition costs or be in a position to influence changes. The general public, strategic planners and futurists, on the other hand, know change is inevitable but hate crises and surprises. They want reassurances that the future promises generic resource availability in a form responsive to changing social values.

Agencies, forest policy analysts, politicians, and decision makers charged with social well-being or stimulating economic activity must weigh as well the immediate political effects of forest policy decisions at least through the next election.

All these parties are seeking insights into collective interaction for their own very different purposes. Generally, people either want to react more effectively to change or to manipulate policy. As it becomes increasingly obvious that Idaho forest policy concerns deal more with who gets the slices of existing forest pies rather than whether bigger future ones can be baked, the analyses must be insulated from the players to keep the answers honest and impartial.

We may find that agreement on the right questions will not come easily. In fact, it is clear that some forces don't want any questions asked at all, for information is a double-edged sword. Spokesmen from different groups have conflicting interests and it is rare when a plurality represents the public interest. Reaching a consensus on the use of the answers may be even worse.

Forest models usually presume that it is something in the forest that causes timber supply problems and that forest sector regulation can abate them. A more realistic view is that perturbation is actually exogenous, with the effects visible at the forest level. The biology in traditional models may be endogenous and malleable, but other factors are not. Technological change is inevitable, and manufacturing, communication, transportation, and merchandising evolutions have radically altered the use of resources and effects of resource use regardless of how forests were managed.

Social and economic factors cause the biggest changes, but they are the ones most overlooked in traditional analyses. Idaho's lesson of the 80's was that macroeconomic parameters, such as interest rates and housing starts, controlled timber sector behavior far more than biological factors, yet were totally beyond the reach of forest policies.

The gaps discovered in the existing projections are small compared to the effects of a single recession — and wait till the next one.

Economic variables change with business cycles and erratically with shifts in government policy and the state of the world. Since they cause profound changes with short-run effects and long-run implications, it makes sense that our models consider them.

Long forest rotations invariably lead analysts to the questionable tradition of the long run. However, more people appear interested in the short-run and the probability of short-run exogenous perturbations quickly make long-run timber projections obsolete. In the short run, the economic influences are obvious and the fact that short-run inventory and biological conditions are relatively static makes the entire system easier to model. In addition, the timber production function, though complex, is one of the most temporally flexible. What

other production processes can be redirected in mid-stream?

Traditional biological growth projections have provided Idaho with a starting point, but it would take a complex model structure or more than one model to address the gamut of timber supply questions we've raised. People have different perspectives. Some focus on the standing resource, others on products, values, environmental effects, and economic impacts. This suggests that they might be best served by different models, so our analyses must vary in scope, emphasis, resolution, and temporal focus. Perhaps there should be a set of instruments, each calibrated to different interests, but mutually interactive.

There are four types of models that might be appropriate to build and maintain at the state or regional level. Idaho is behind most states and has none of these. They include:

a. a user accessible timber supply model designed to estimate longer-run timber availability and economic implications of forest sector behavior and policy within a region. We do have the biological first step.
b. an impact estimation framework applicable in detail to any local economy which captures any type of resource perturbation (not just timber induced) across all relevant sectors.
c. a strategic model of land use allocation and multiple resource production that spatially tracks general economic development.
d. localized market level models of forest products trade with sufficient detail for making and tracking short-run industrial decisions.

The modeling paradox holds that we wish at the same time to create an abstraction of the real world that is detailed enough to be an accurate representation, while it is simple enough to be inexpensively built and maintained and easily interpreted. The choice of an analytical system depends on the cost of the questions asked and the answer's expected value.

If Idaho could afford only one model, the impacts model takes precedence. That is where the most intense interest now exists. The Idaho Timber Supply Study already approximates gross timber availability questions. While I believe that an economic model would give us different and more accurate answers, financial and political support for such an effort may not reemerge until the next crisis reaction cycle.

The strategic resource model would ideally be the policy analysis tool of politicians, asking the sector interaction questions that Governors like. No state has one, possibly because the model would be expensive and complex to avoid being superficial, and the concept is new. In reality, a publicly visible policy analysis capability may not be as desirable to politicians and decision makers as analysts suppose.

The proposed local market model, potentially the most elegant structurally, would be expensive, intrusive, and serve a narrow set of industrial interests. The data and assumptions of such local models also make them less credible.

The information that any of these models generate, summarize, or interpret is not cost-free. While it is logical that such efforts be left to those who would gain from them, there is an argument for timely collective action to avoid political influences and the cyclic

panics. The question of who should initiate and finance these analyses includes the commitment for maintaining and improving the systems. Models are too often built, tested, and shelved, when their real value is in repetitive analysis, reanswering questions as the world continues to change.

In summary, we are beginning to see finer geographic resolution in timber supply studies, but there is a wide divergence in purpose. Local and market level concerns have increased and these questions are not well addressed by the traditional inventory projection techniques used in Idaho.

The interest in detailed price and impact effects in the short run suggests that economic questions should take precedence over biological ones in policy analysis. However, the diversity of interests suggests that a network of forest sector models, which could include long-run timber availability models, may be necessary. It is clear that a visionary approach to analyzing resource policy issues, free from political manipulation, would be preferable to the reactionary one we've so far employed.

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Charley McKetta is an associate professor of Forest Resources.


**DO SOMETHING WILD!**

# More than Meets the Fly

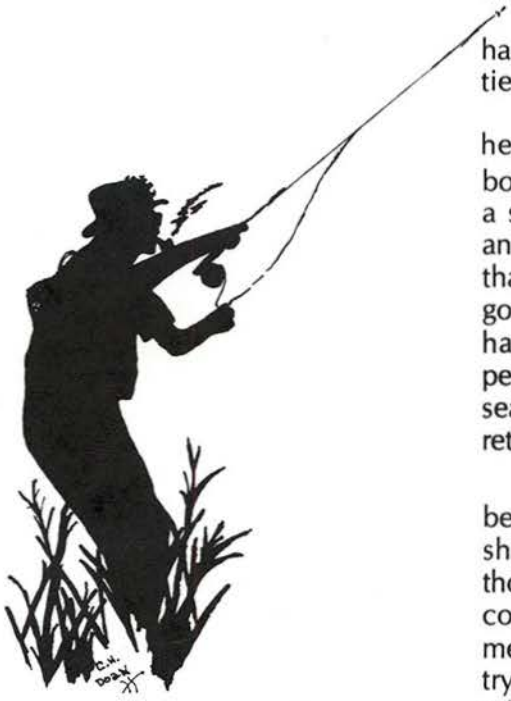
**by Ken Johnston**

I learned an important lesson about fishing today. I did not learn it from a book or a magazine, nor from one of those hotshot TV fisherman. It was the kind of lesson I could only have plucked from within myself, and from this day forward my ideas of "success" in fishing will never be quite the same.

This was the Big Day, for today I would fish Silver Creek for the last time this summer. I woke up realizing that today I must perform; today I must stir those fish which had eluded my flies all summer long. As I plunged my truck into the south-bound Ketchum traffic, I was optimistic despite my self-imposed pressure.

By the time I reached Bellevue the morning air had warmed enough for me to roll down the window. As I left the town behind me and veered left onto the Picabo cutoff, I drew a deep, succulent wiff of the farmy aromas and recalled how much I enjoy the 17-mile piece of country road which links Bellevue and Picabo. The narrow road was paved once a long time ago. It is skirted by grass which creeps right up to the asphalt. To the east lie scabby hills, sparingly adorned with sagebrush. In the basin to the west lie croplands with working hands and sprinkler lines that sprayed me as I sped by. Further down the line the road passes through Gannett and eventually meets up with Highway 68, the main route of access to Silver Creek.

Silver Creek, for the unfamiliar, is a flyfisherman's paradise, though one need not fish here to enjoy the aesthetic beauty of this desert oasis. The headwaters consist of a series of springs which rise from the volcanic rock of the desert basin near Picabo, about 35 miles southeast of Sun Valley. In the mid-seventies the Nature Conservancy purchased several land parcels enclosing a two-mile stretch of Silver Creek and some of the tributary waters. This action was taken to protect the unique but fragile environment from damage caused by farming practices in the area. Though best known for the fishery, the Conservancy land hosts a diverse and productive habitat for waterfowl such as the great blue heron, and mammals such as deer, coyote, badger, skunk, beaver, and muskrat.



Each time I travel the gravel access road from the highway to the creek, I park my truck by the bridge of Stalker Creek, a Silver Creek tributary, and get out to observe the fish and their feeding patterns. Today a twelve-incher fed beneath an overhanging shrub, but that was all I saw.

After a few minutes, I continued down the road and parked the truck near the Conservancy headquarters, a small log cabin near the stream. I geared up quickly, strapped on my waders, and approached the cabin to sign the registration book. I was greeted there by the resident caretaker of the Conservancy, an elderly spectacled man who possessed a youthful enthusiasm.

"Can I see your flies?" he asked. "I might be able to tell you what's workin'."

"Yeah, okay," I replied, and handed him my box of specially tied Silver Creek flies.

"These here might be good," he said, plucking a fly from the box and inspecting it, "but they're a size small. I scouted yesterday and they're running a little larger than normal. I think I got some good ones in the office, if you can hang on a minute." He disappeared into the cabin and I took a seat on the bench and awaited his return.

I recalled that it was on that bench several years ago that I shared a lunch with guide and author Fred Arbona. "It's beautiful country, isn't it?" he said, handing me half a sandwich. He had been trying all morning, unsuccessfully I might add, to help me catch a fish

on this stream. I came up empty that day, but Fred assured me that this was one of the most difficult streams to fish. He encouraged me to keep trying. I did keep trying and, by sticking to it, future outings were successful until it became a rarity for me to strike out on Silver Creek.

Soon the old man returned, informing me that he'd already divvied out all his flies. "But if you like, I could tie a couple for you."

"Oh, no thanks," I replied. "I'll make do."

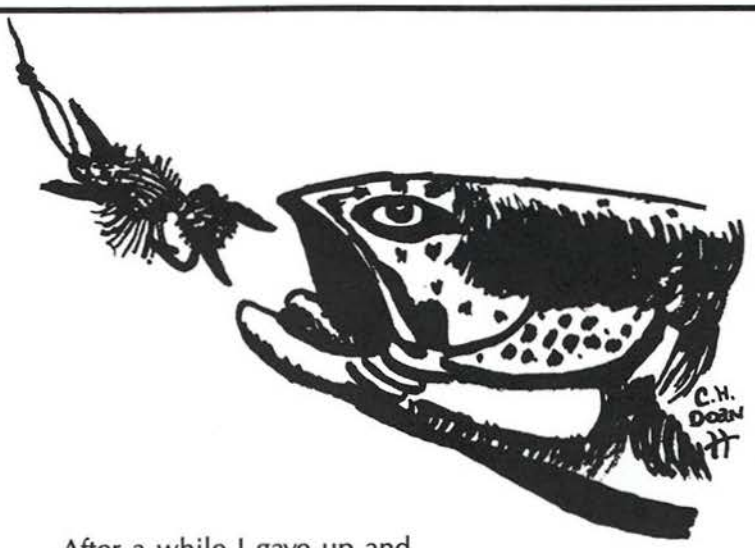
"Well, alright then. Good luck," he said. And with that, I ambled down the dusty trail to the creek.

Shortly after I hit the water the mayfly hatch began erupting en masse; the ascending insects literally clouded the air above the water. I could see that three species were hatching at once, and as the water boiled with feeding fish, I licked my lips and I assessed my chances.

A mayfly hatch on Silver Creek can provide moments of glee or intense frustration to the flyfisherman. With the right fly and a well-positioned cast, the fisherman stands a fair chance of nailing something. With the wrong fly or less-than-perfect cast, the chances are minute.

I spotted a pod of large risers downstream to my left and began peppering my casts among them. It soon became apparent that they were ignoring my fly, so hastily, I changed flies.

Then, as quickly as the hatch had commenced, it quietly dissipated — along with my prospects for a fish. I cast about listlessly to few of the late risers, cursing myself all the while for refusing the flies the old man had offered to tie for me.




After a while I gave up and rambled back to the truck. I stopped briefly to chat with the old man, who had chosen to sit out the morning hatch. "Any luck?" he inquired.

"Nope," I replied, "not a thing. I've never seen anything like that. I guess I kinda' panicked."

"It can get kinda tricky," he assured me, "when you got three or four of 'em hatching all together like that."

Dejected, I drove back to Bellevue for an early lunch. I stopped at a small cafe and reflected upon the morning as I waited for my food. The thought that I choked in the midst of overwhelming opportunity still disturbed me, and I lingered on that for awhile. But then something occurred to me that I had missed before. I had just witnessed something that relatively few people experience, or at least understand; something primal and not unlike lemmings rushing to the sea, or wolves howling at the moon. Come to think of it, before there were wolves or lemmings there were mayflies hatching in enormous numbers, to be swallowed up by feasting trout. And I was there in the midst of it all — that ought to count for something.

Feeling consoled, I finished my meal and returned to the truck. It was very hot out now, at least 100 degrees, plus twenty degrees warmer in the cab of my truck. Clad in shorts, my thighs seared as they touched the vinyl seat.

My outlook improved with each passing mile as I guided the truck back to Silver Creek. All was not lost. I will catch something this evening. And as for that moment, I was driving on my favorite piece of country road.

As I passed through Gannett I wondered, as I often do, about the people who once inhabited the abandoned homesteads around me. Who lived in these old farm houses? What kind of lives did they have? What did they do for fun? Today in the sweltering desert heat I think I caught a feeling for what it must have been like.

In front of the Gannett Store, two small children on bicycles were riding around in circles being chased by a black lab. This alone would raise a chuckle from me, but the old man in black suspenders put me over the top. The old man stood on the porch of the country store, and equipped with

a hose, he was watering down the three to the delight of everyone. As I slowed down to take this in I could scarcely hear the giggles of the children above the jolly laughter of the old man. The contagion then swept through me, too. At first I chuckled, and then I laughed aloud, and then hysterically, as I banged my fist on the dash. I chuckled some more, and then sighed and drove on.

I had no more luck with the evening hatch than I had had in the morning, and spent the better part of the afternoon gazing hypnotically at the clouds. At the border region of Idaho's mountain and desert country gather very profound cumulous clouds which reach high into the atmosphere. They always seem sculpted and I think if I could designate a place called "Cloud Capitol of the World," this place would be it.

Most evenings at Silver Creek I fish long into the twilight, but tonight I did not. On evenings like this one, when I leave streamside before sundown, I've made it my ritual to park my truck above the Sullivan Ponds which empty into the creek. This evening, in the sun's waning light, I watched as large trout sipped tiny insects from the pond's surface one hundred feet below me. I watched them for several minutes, and then lifted my gaze to the splendid valley, which is halved by the wandering S-curves of the stream. To the distant east a desert squall raged above Craters of the Moon, flashing lightning every few seconds. Across the valley the hilltops reflected magenta by the sun's dying rays.

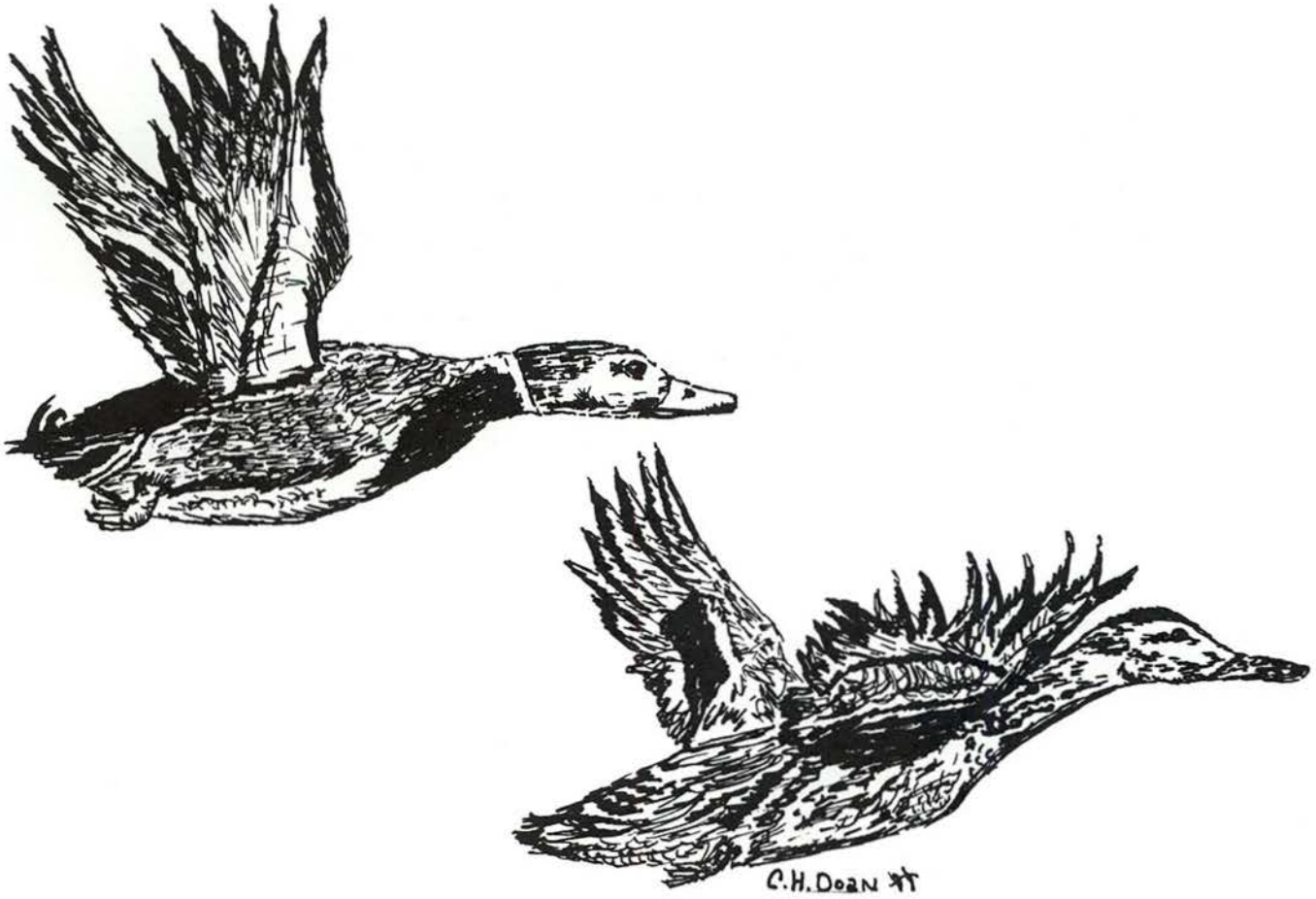
I did not catch a fish at Silver Creek today. I did not catch a fish here all summer. But as I sat there in the dirt and let the moments of the day preach to me, it didn't matter. It really didn't matter.

The sun is gone now, and soon it will be dark and chilly again over the Western land. But as I get back in my truck and chart my way home, I know my heart will be warm as I remember this day spent fishing in Idaho.



*Ken Johnston is a graduate in Wildland Recreation Management and a published writer.*

# College Focus



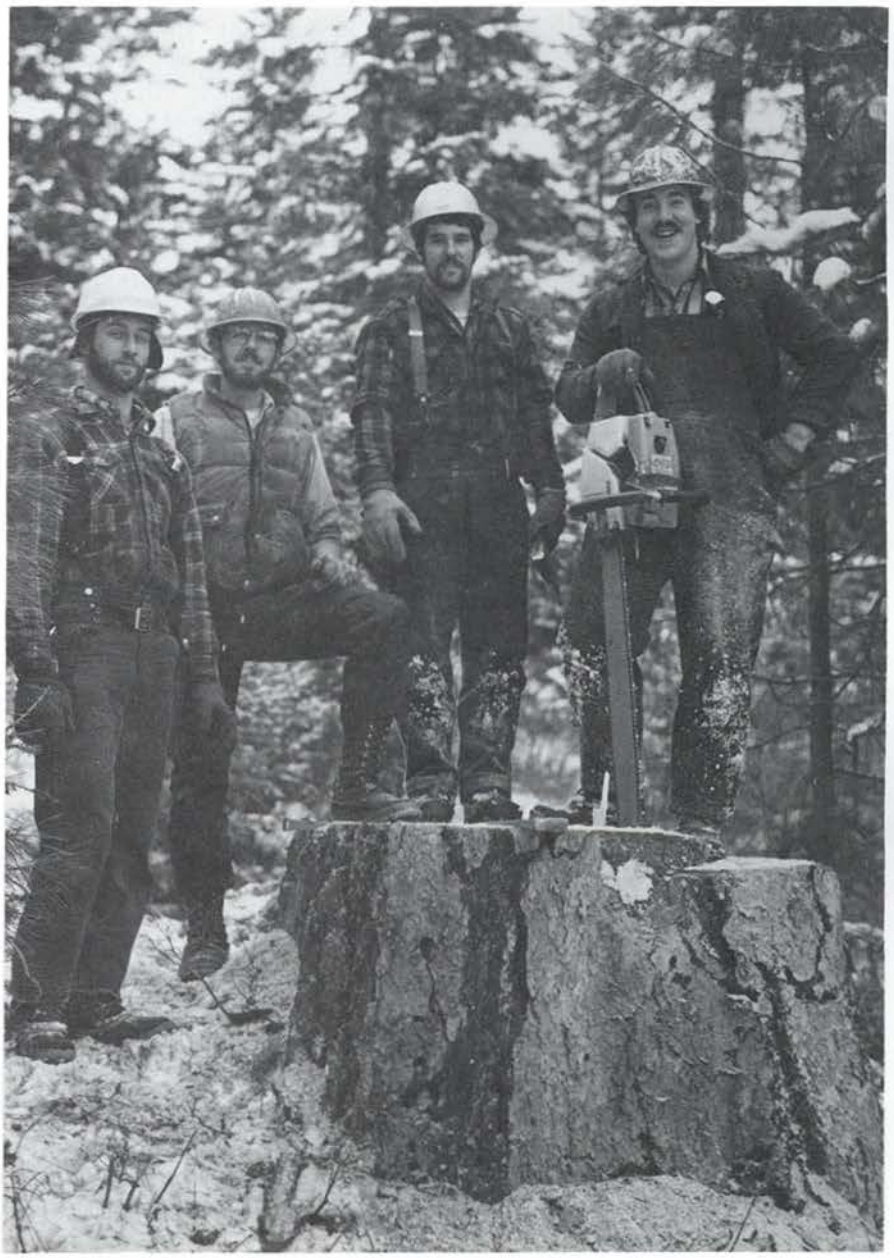
# UI Experimental Forest

**by Harold L. Osborne**

As one views the forested slopes of Moscow Mountain from a distance, they appear to be just that, forested slopes. A closer inspection reveals a system of roads leading to and through selection cuts, seedtree cuts, shelterwood cuts and clearcuts. The visitor will also find natural areas, stands of various species and of various ages and conditions, fenced and open areas and grazed and ungrazed forests and meadows. An even closer look will reveal trees with metal tags, plot stakes and photo points, informational and directional signs. The visitor may encounter graduate students, faculty members with their various classes or members of the student logging crew. The UI Experimental Forest is a busy place.

The land was acquired largely through donations from Forest Development Company, now a part of Potlatch Corporation, from 1932 to 1936. Other purchases and donations in more recent years have resulted in a 7,200 acre forested area dedicated to teaching, research, demonstration, public use and production.

The Experimental Forest is located on the forested slopes of the Thutuna Hills, known locally as the Moscow Mt. Range. The terrain varies from gently rolling to steep, all dissected by draws and intermittent streams. The streams have given their names to the various units such as Flat Creek, Hatter Creek and Big Meadow Creek. This variable topography gives rise to a mosaic of soil types and secondarily, a range of habitat types from the dry Douglas-fir to the cold and moist Subalpine fir



Harold Osborne

Greg Danly, Ross Applegren, Darwin Baker, Mike Reggear

in the wide and flat creek bottoms. Turn of the century logging activities resulted in a mosaic of stand conditions across this landscape. Big game and other wildlife find the variable stand conditions to their liking. White tailed deer are abundant and mule deer and elk also inhabit this forest area. Moose, mountain lions and black bear also are found.

Imposed on this varied forested landscape are the myriad activities and influences of the faculty and students of the College of Forestry, Wildlife and Range Sciences. Forty miles of primary gravel and secondary dirt road provides access for research, teaching, public use and operational activities. During 1987, there were 16 active research projects such as the management of mixed conifer stands for fuelwood production, the effects of the length and timing of cattle grazing on post-burn site productivity and a project on vegetation management and the use of herbicides for forest weed control. Results from the fuelwood project will help landowners better manage their woodlots for fuelwood and increased sawtimber production. The cattle grazing study will provide useful information to managers who help determine the numbers, timing and distribution of livestock in the forest. Silviculturists and forest landowners will find the results of the herbicide project useful in determining when and where to use forest herbicides for site preparation and conifer release. All these projects will result in useful information and guidelines for the management of Idaho forests.

The student use of the experimental forest is constantly increasing. Most visible is the student logging crew. Each year 7 to 10 students from the College of Forestry, Wildlife and Range Sciences participate in the management and harvest of up to 2 million board feet of sawtimber. The average harvest unit is 10 acres with a variety of cutting practices applied adjacent to one another to provide variety, diversity, and opportunity. Student loggers assist in the layout, harvest prescriptions, and timber marking and then conduct the timber harvest by falling, skidding and bucking the timber into sawlogs. Students also do the slash disposal, prescribed burning, resource inventory work, general facilities maintenance, and the tree planting. In 1987, twenty-six student employees performed 12,000 hours of labor on the experimental forest. In addition to the "hands-on" work, students in a wide variety of classes visit the forest for laboratory and field trips. Nearly 3,000 student hours were spent on trips to the forest. No doubt, many more student hours were spent burning the midnight oil on projects related to the filed trips. Examples are Forest Products 432, Low Volume Roads, a class whose field project includes the layout and design of forest roads, or Forest Resources 324, Silviculture, a basic course in the manipulation of forest stands.

In 1987, the Experimental Forest became a focal point, for local ranchers, landowners, and elected officials came to view management activities, especially new forest plantations, and to discuss and dispute the legal and ecological issues of open range. On a more friendly note, 230 boy scouts, leaders and parents spent a weekend at West Hatter Creek for the Boy Scout Camporee. The forest is also the host for Community Forestry Day, where local foresters meet the public and discuss forest management activities and practices and communicate the role of the forester. This year, 175 people came for the nature hike, demonstrations, picnic lunch and other forestry day activities on the Flat Creek Unit.

The general public uses the Experimental Forest for a wide variety of recreational activities that include hunting, hiking, cross country skiing, and other day use activities. More formal trips are conducted for tree farmers, students, legislators or other people who have a need to view and learn from the activities on the Experimental Forest of the College of Forestry, Wildlife and Range Sciences. So, from what appears at a distance to be just trees is much more; the Experimental Forest is an outdoor laboratory for the students and faculty, it is a demonstration and research area for the state of Idaho and it is a recreation area for the people of Latah County and adjacent areas.

*Harold Osborne is manager of the University of Idaho Experimental Forest.*

# Biotechnology Comes to Forest Resources!

by Carol M. Stiff and Steven J. Brunsfeld

Did you ever think you could hold an entire forest in your hands? Did you know that a single needle fascicle has the potential to produce hundreds of trees, or that the DNA "blueprint" could be removed from a tree for study or change? These are all possible and some are actually being realized in the new biotechnology laboratory recently organized in the Department of Forest Resources.

The biotechnology laboratory was set up to conduct research in plant tissue culture and molecular biology by Steve Brunsfeld, Carol Stiff and Dr. David Wenny.

## Plant Tissue Culture

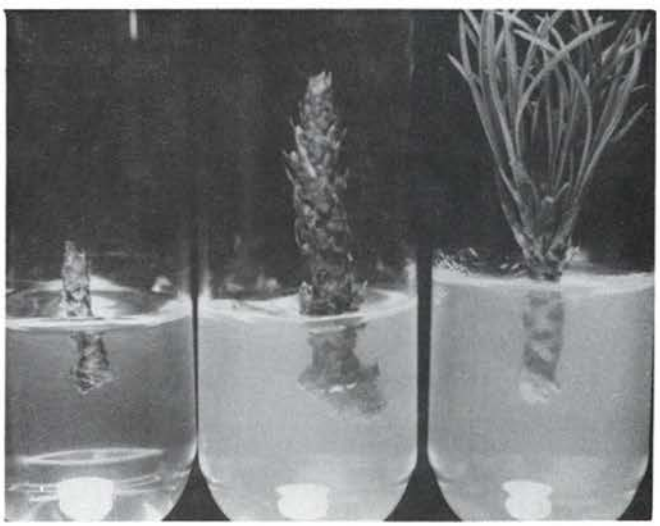
The plant tissue culture section of the laboratory became operational in late August and is the Micropropagation Unit of the UI Forest Research Nursery, managed by Dr. David Wenny, Associate Professor in Forest Resources. It is directed by Carol Stiff, a plant tissue culture specialist and Ph.D. student in Forest Resources. The tissue culture research is funded through an IMAGE Seedgrant, a UI Research Seedgrant, UI Wood Boiler Research Funds, and Stillinger Fellowships received by Carol Stiff, David Wenny and Kas Dumroese.

The research deals with the practical application of tissue culture techniques to forestry — mainly the mass propagation of forest tree species, including selection for beneficial traits such as herbicide tolerance. Once the tissue culture techniques are worked out for a particular species, we can transfer the new plantlets to the Research Nursery and determine the conditions necessary to acclimate the plantlets and grow them to a marketable size. Having the Forest Research Nursery affords us the opportunity to actually see our research applied and utilized in nursery production.

Stiff's major project is the micropropagation of western white pine using needle fascicles. The "mother" plant is sprayed with the cytokinin benzylaminopurine. This induces development of the fascicle bud. These buds are then excised and grown in aseptic culture to induce shoot development from the bud, growth of axillary buds, and root formation. This system should result in the production of greater numbers of propagules than could be realized by conventional means. Characteristics of the parent plant would be maintained, and therefore traits such as disease resistance would be maintained in the clones. Our goal is to eventually mass propagate rust-resistant western white pine. Similar methods will be tested on other pines.

Stiff and Kas Dumroese, UI Nursery Research Associate, are researching the mass production of Idaho hybrid poplar using nodal or shoot tip culture techniques. The goal is to develop a more efficient method of propagating Idaho poplar which would save time, space, and allow year-round production.

Herbicide resistance in trees is being investigated by Stiff and Wenny. They are screening Idaho hybrid poplar (developed from leaf tissue or from isolated protoplasts) for tolerance to the herbicide Roundup® . Plantlets that survive will be field tested, and those resistant to the herbicide will be mass propagated.



Western white pine fascicle bud, left — excised, disinfected and cultured in nutrient medium (day 0), middle — buds elongation and auxillary bud development on the shoot (day 30), right — bud elongation and 2 needle growth (day 30).

Multiple bud proliferation from cotyledon tissues of larch germinants is being investigated by John Edson, an M.S. graduate student in Forest Resources. The buds will be isolated from the parent tissue, elongated and rooted. His goal is to develop a production-scale propagation system for larch, alleviating problems caused by seed shortage.

A laboratory manual on micropropagation techniques is being prepared by Stiff, and a course on tissue culture in forestry may be developed. Future research will involve developing micro-propagation techniques for other forest tree species and screening for tolerance to other herbicides. Gene transfer experiments utilizing *Agrobacterium,* carrying engineered plasmids for herbicide tolerance are also anticipated.

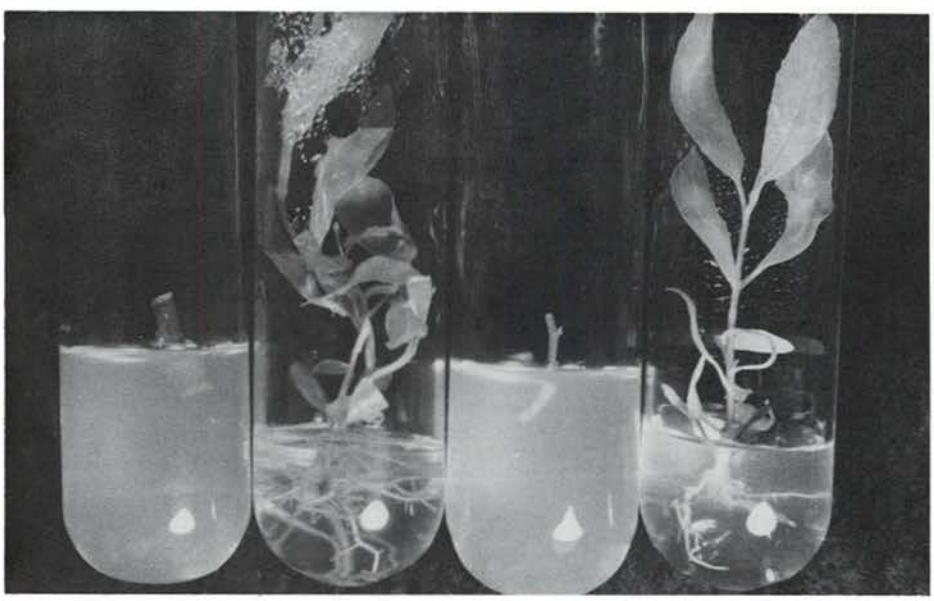
**Molecular Biology**

The molecular biology section of the lab is being developed by Steve Brunsfeld, Research Associate and Instructor in Forest Resources and a Ph.D. student in Botany at WSU. With some minor remodeling just complete, the molecular biology lab is now in operation. Brunsfeld's first project is a genetic analysis of flowering dogwood (*Cornus nuttallii*). A small disjunct population of this beautiful tree occurs in Idaho in the lower Lochsa and Selway River canyons, separated hundreds of miles from the next nearest population in the Cascades and Sierras. This research will employ enzyme electrophoresis to look for genetic differences between the coastal and Idaho trees. In recent years, the Idaho plants have been ravaged by disease, so if they are found to be genetically different, steps may be necessary to save their potentially valuable gene pool.

Steve will also be starting work soon on analysis of plant DNA. This new technique involves searching for mutations by cutting DNA molecules with special enzymes that recognize certain sequences in the genetic code. This is a very powerful means of detecting genetic differences that might be related to important traits. With this information, one is also able to map portions of the DNA molecule, a prerequisite to later genetic engineering.

The Biotechnology Lab is located in 208A&B of the FWR building. Stop by any time and discover what's new in forestry.!

*Carol M. Stiff is a plant tissue culture specialist and Ph.D. student in Forest Resources; Steven J. Brunsfeld is Research Associate and Instructor in Forest Resources and a Ph.D. candidate in Botany at Washington State University.*



# Wood For Energy: A Working Example On the UI Campus

**by Leonard R. Johnson**

What does a $3.5 million dollar investment have in common with a $1000 wood stove? For the average homeowner, an investment in a wood stove is aimed at reducing the budget on fuel bills and decreasing dependency on fuels where the supply and costs have been affected by international events, oil embargoes, water shortages, and other factors they can't control. At the University of Idaho a $3.5 million dollar investment in a wood-fired boiler for heating the campus was made with the same objectives in mind. While the wood burned in a wood stove usually heats the air of a home directly, the heat generated by burning wood at the UI is used to produce the steam needed to both heat and cool the buildings on the UI campus.

**Why a Wood-Fired Boiler?**

The upgrade of the UI heating plant evolved from a need to replace two of the older boilers in the facility and from community interest in the possibility of burning the municipal solid waste generated in Latah County rather than disposing of it in a landfill. The oldest boiler in the plant dates to 1940. The boiler was still in good condition, but upgrades were needed in its control system and other safety features. Two small boilers installed in 1956 were worn out. The plant also had two larger boilers fueled by natural gas.

Insufficient quantities of municipal solid waste in the immediate vicinity of Moscow, and the state of technology in burning this type of material, caused the planners at the UI to look at other fuels and heating systems to fill the heating and cooling needs of the campus. A feasibility study completed in 1983 pointed to the potential of wood fuel and lead to a request for bids for construction of a heating plant addition that would use wood as the fuel source. The contract was awarded to Solid Fuels-Midwesco in 1985, and construction on the plant began in the spring of 1986.

The heating plant investment included installation of a handling system required to dump wood fuel from trucks, move the fuel from the dump to a storage silo, and then move stored fuel from the silo to the combustion chamber of the boiler. A new boiler with a steam capacity between 60,000 and 75,000 pounds per hour and that is capable of burning wood with a variety of sizes and moisture contents was also installed. The wood-fired boiler is of sufficient size to meet the heating needs of the campus under most weather conditions. The project also included a retrofit of the 1940 boiler with new controls and safety features. The retrofit boiler has smaller capacity (35,000 pounds of steam per hour) and can be used to produce steam efficiently in summer periods when the demand is low or to produce additional steam in extremely cold periods.

The 1985 plans estimated annual fuel savings from the new facility at $900,000. Reductions in the price of natural gas in the last three years have reduced the fuel savings estimates to $300,000-$400,000 per year. Although it is not economically feasible at this time, the UI wood-fired system is also set up to allow addition of the components necessary to cogenerate electricity with the heating steam.

**Availability of Wood Fuel**

Another incentive for construction of a wood burning facility is the current availability of wood fuel. Sawmills and other wood manufacturing plants in Idaho currently face a significant problem with disposal of the wood waste created in their manufacturing processes. Material of insufficient quality to make the primary product, bark removed from logs before manufacture, and sawdust and shavings produced by saws and planers need disposal. Some of this material can be chipped and sold as pulp chips. Some can be used by manufacturers of particle board and other wood composite products. However, significant quantities of bark, sawdust, and other wood fiber remain unused.

Wood waste used to be disposed of in tepee burners that were part of the landscape of every sawmill, but air quality regulations have eliminated this method of disposal. Most mill complexes use their own wood residues to provide heat for their own needs. This combustion takes place in sophisticated systems that can burn wood under tight air quality controls, but the heating and steam needs of most mills use only a portion of the residue it produces. There is still too much bulk material for any local landfill to accept, so the wood waste piles up and a potential resource becomes a major problem. In some

areas potential leaching of chemicals from the residue piles causes concern about possible effects on water quality; heat buildup in the piles produces a constant threat of spontaneous internal combustion.

The residue material represents a potential fuel resource and the current abundance of supply makes it available at very reasonable prices. Currently, the biggest cost of using mill residues will be in the transportation costs incurred in delivering the material to the boiler. Availability and low price make mill residues sound very attractive as a source of energy. However, the problems associated with efficiently handling and burning the material have limited the number of wood-burning facilities. The UI wood-fired boiler is one of a few systems in this region operating independently of a wood products manufacturing plant.

### Characteristics and Problems Associated with Hog Fuel

Wood residue used for producing energy is commonly called hog fuel. The name is derived from machines used to break larger wood pieces into smaller sized particles. The machines, called hammer hogs, use many metal "hammers" on rotating disks to crush and grind larger wood pieces. The product of the hammer hogs ranges in size from a very fine dust to pieces up to four inches. When this material is combined with the bark removed before sawing and the sawdust produced in the milling process, the result is a fuel with a relatively wide range in size. Handling and combustion systems must be designed to accommodate this variation in particle size. Moisture content of the hog fuel can also vary widely from one truckload to the next.

Homeowners who use a wood stove to heat their homes look for firewood that is dry and sound. Dry wood burns more efficiently and cleanly than wood containing a high percentage of water. Less heat is required to burn off the excess moisture and less air is required to keep a good fire going so more of the heat is available for the intended job of heating the home. Less maintenance is required on the stove because of the reduction in unburned particles.

Operators of large wood-burning facilities would also like to have their fuel in this dried condition, but usually have to accept material that is much less desirable. The fuel used in most wood-fired boilers has been produced from green logs, contains bark that was removed in a wet debarking process, and has been piled outside in the rain and weather. Half of the total weight of the fuel will often be in the water it contains.

Fuel handling and combustion systems that can accommodate the inconsistencies in moisture content and size fractions cost more than systems designed around a very uniform and consistent fuel like natural gas. The fuel handling and storage system for a wood-fired facility will often require more capital than the actual boiler and combustion component. This constraint places lower limits on the size of economically feasible wood-fired systems found outside the forest products industry. Smaller systems often cannot be justified because of the high percentage of the investment involved in fuel handling and preparation equipment. Installations at forest products plants often use parts of the material handling system already in place.

Variability in fuel size and moisture content also makes efficient combustion more difficult. Control of factors, like the amount of outside air, need to be changed with each change in fuel moisture content. Combustion of a predictable, uniform fuel like natural gas will require less attention than combustion of wood. The extra attention can translate into higher operating costs for the system.

Even with these potential problems, savings in the cost of fuel at the wood-fired facility at the UI were sufficient to justify the investment. The problems anticipated with the system can also be translated into research opportunities.

### Research Opportunities with the UI Boiler

Solutions to some of the problems associated with burning hog fuel could encourage construction of additional wood burning facilities and create more demand for the unused wood residue now being stockpiled at mills. For example, preliminary processing of the hog fuel could result in lower investment requirements for heating plants that burn wood. Preliminary drying of the fuel would provide consistency in moisture content, would allow production of more usable heat in the combustion process, and would reduce quantities of undesirable emissions and ash from the system. Preliminary drying of the fuel requires an investment in energy and additional

handling, however, that can only be justified by reduced investment and operating costs and increased system output in the boiler. A process step that sorted the hog fuel by size classes could simplify both the fuel handling and fuel combustion systems of a wood burning plant. Investigation of the economic tradeoffs for these options could result in an industry that would size and dry hog fuel for use by smaller wood-burning installations.

The UI administration recognized the research opportunities associated with a wood-fired boiler operating independently of a wood processing plant on the campus of a research institution and used some of the savings in fuel costs to underwrite a research initiative in wood energy. The boiler will be used as a full-scale research tool to establish the relationships between fuel characteristics and combustion efficiency of the plant. The economics of drying and sizing fuel will be investigated in cooperation with a fuel contractor, Coeur d' Alene Fiber Fuels, along with the capabilities provided by a large rotary drum dryer donated to this and other research efforts in wood drying by the Weyerhaeuser Company. The relationships between fuel characteristics and steam, ash, and emissions from the boiler will be studied in detail.

Additional research work will consider the cost and availability of wood fuel supplies to the Moscow location. The work will result in a computer database and model that can quickly compare costs of fuel alternatives, including wood residue obtained from the forest rather than from a mill. One of these fuel alternatives represents the ultimate in self-sufficiency growth of our own wood fuel for the boiler in the form of fast-growing Idaho hybrid poplar. Research on the factors that maximize plantation growth of the poplar looks to the future when mill residues may not be as readily available as they are now.

UI funding for these basic research projects has been used as seed money to generate additional support for research on a broad range of projects related to wood and energy. Ongoing wood energy projects now include studies on the growth of hybrid poplar, options for recovery and processing of logging residues and previously non-commercial timber, analysis of wood pellet production and use in home and industrial heating, an inventory of forest residues in the state, an inventory of commercial and public buildings where wood might be an economically viable fuel, the interactions between wood fuel characteristics and combustion efficiency, particulate emissions, ash content, and potential uses for the residual fly ash.

Delays in start-up and continuous firing of the boiler have delayed progress on some of these projects, but initial procedures and methods have been developed and established. Baseline data have been collected on air quality in Moscow before use of the boiler so that the impact of the boiler on particulates in the air can be determined. Two plantations of Idaho hybrid poplar are growing under a variety of spacing and fertilization conditions. Delivered hog fuel is being tested for moisture content and the distribution of particle sizes. Field studies and cost determinations have been completed on several options for recovery and processing of forest residues. Analysis is being done on the costs of wood pellet manufacture and the quality and energy content of wood pellet fuels.

Momentum and focus in the area of wood energy is expected to continue as the wood-fired boiler reaches a normal operating mode. Results of this research initiative could result in greater utilization of forest and mill residues through an industry that drys, sizes, and processes wood wastes into a more usable wood fuel product. Use of wood as a fuel could increase as the systems needed to handle and burn that fuel become simpler and more economically attractive on a smaller scale. The research efforts should allow the State of Idaho to continue on a road toward more self-sufficiency in energy and perhaps even allow the state to become a net exporter of energy.

*Leonard R. Johnson is Professor of Forest Products, College of Forestry, Wildlife and Range Sciences, University of Idaho.*

# Lee A. Sharp Experimental Area

7800 acres located on the east side of the Raft River Valley between the Black Pine and Sunbelt mountain ranges, the Lee Sharp Experimental Area is used by students for research in range and livestock.

Approximately 7,054 acres were planted in desert and crested wheatgrass in the fall of 1952 with funds provided under the Halogeton Control Act. This land is administered by the Burley District of the Bureau of Land Management. Nine-hundred and sixty acres of this land were set aside in 1954 for grazing studies testing three intensities of grazing in two seasons. Watering facilities were expanded in 1987 so that pasture size could be further subdivided and animal rotation frequency increased.

Formerly named Point Springs Experimental Area, Lee A. Sharp Experimental Area was renamed by the Bureau of Land Management in 1984 because of Dr. Sharp's founding and development of the area into the research facility it is today. The experimental area was set aside and studies initiated under a Memorandum of Understanding among the Bureau of Land Management, University of Idaho, and the Point Springs Grazing Association. The land, fencing, corrals, and the trailer house are the property of the BLM. The University purchased and/or constructed the water troughs, the metal shop building, the pole-metal garage and shop, the water pump, scale, scale house, wooden sleeping quarters, installed an electrical line and paid for part of the fencing material. Electrical fencing material used in the conduct of the short duration grazing trails were puchased by the University of Idaho. The Point Springs Grazing Association owns the livestock and has invested in fence maintenance and installation of the water troughs.

University of Idaho student research emphases include grazing management, animal behavior and nutrition, salt consumption, soil compaction, water infiltration, variability in forage production, and economics of range improvement. Livestock are grazed in the spring and fall of the year and move to Forest Service and BLM range lands for the summer.

## Pococurante

He was not a
man for zucchini;
a jackeroo was he.
Cheeks were rufous
from Manzanilla,
no, possibly rye.

Katydids would not play
for such a pococurante.
He would rather them crushed
in his nicotine stick,
hanging from his five-day
grizzled beard.
He would not be playing
the zether in Heaven
but maybe a rubber
band in Hell.

— Cynthia Sills

# Clark Fork Field Campus

## Four Seasons of Discovery

Just outside of Clark Fork, Idaho, at the base of Antelope Mountain, is the University of Idaho's Clark Fork Field Campus managed by the College of Forestry, Wildlife and Range Sciences. The campus features an enrichment series consisting of short courses which offer public education in natural resources. In addition, Clark Fork serves as a multi-purpose research and classroom center for UI students and retreat facility.

The field campus is comprised of several dormatories and bunkhouses which accomodate 50 people overnight. There is also a classroom and administration building available for use.

The campus is open year round. During the summer there are possibilities of fishing at nearby Lake Pend Oreille or bird watching in the Panhandle National Forest. During the winter, one is offered equal time either snowshoeing or cross country skiing while participating in nature study.

For more information on any of our 1988 programs, please call the College of Forestry, Wildlife and Range Sciences, 208-885-8981.

This year's Enrichment Series includes:

| | |
|---|---|
| January 16 & 17 | Animal Tracks in the Snow |
| February 27 | Beginning Fly Tying and Casting |
| March 26 & 27 | Water Birds |
| April 9 | Introduction to Falconry |
| May 7 | Lakes and Streams of the Northwest |
| May 15 | Spring Mushrooms |
| June 26 | Ethnobotany |
| July 30 | Early History of North Idaho |
| August 28 | Wildlife Photography |
| September 10 | Native Ornamental Trees |
| September 25 | Fall Mushrooms |
| October 1 | Forests of the Northern Rockies |
| October 15 | Fossil Collecting and Geologic Tour of the Lake Pend Oreille Area |
| November 5 | Herbs and Herb Crafts |

The greatest mistake you can make in life, is to be be continually fearing you will make one.

— Anonymous



# 1987 Forestry, Wildlife and Range Sciences Awards Banquet

Capping off Natural Resources Week, the Forestry, Wildlife and Range Sciences Awards Banquet recognizes outstanding students and faculty of the year. Each of the college's five departments selects an outstanding senior (or seniors) for their department. Collectively, they choose an outstanding senior for the college as a whole.

1987's Outstanding seniors were:

JUDITH ANN McDONOUGH
Fish and Wildlife Resources
RACHEL ANNE VANDENBURGH
Forest Products
BRUCE D. and
JEANNE MAE HIGGINS
Forest Resources
BONNIE JEAN LAMBERS
Wildland Recreation Management
JAN MARIE PENCE
Range Resources and FWR College Outstanding Senior

Faculty awards were presented to:

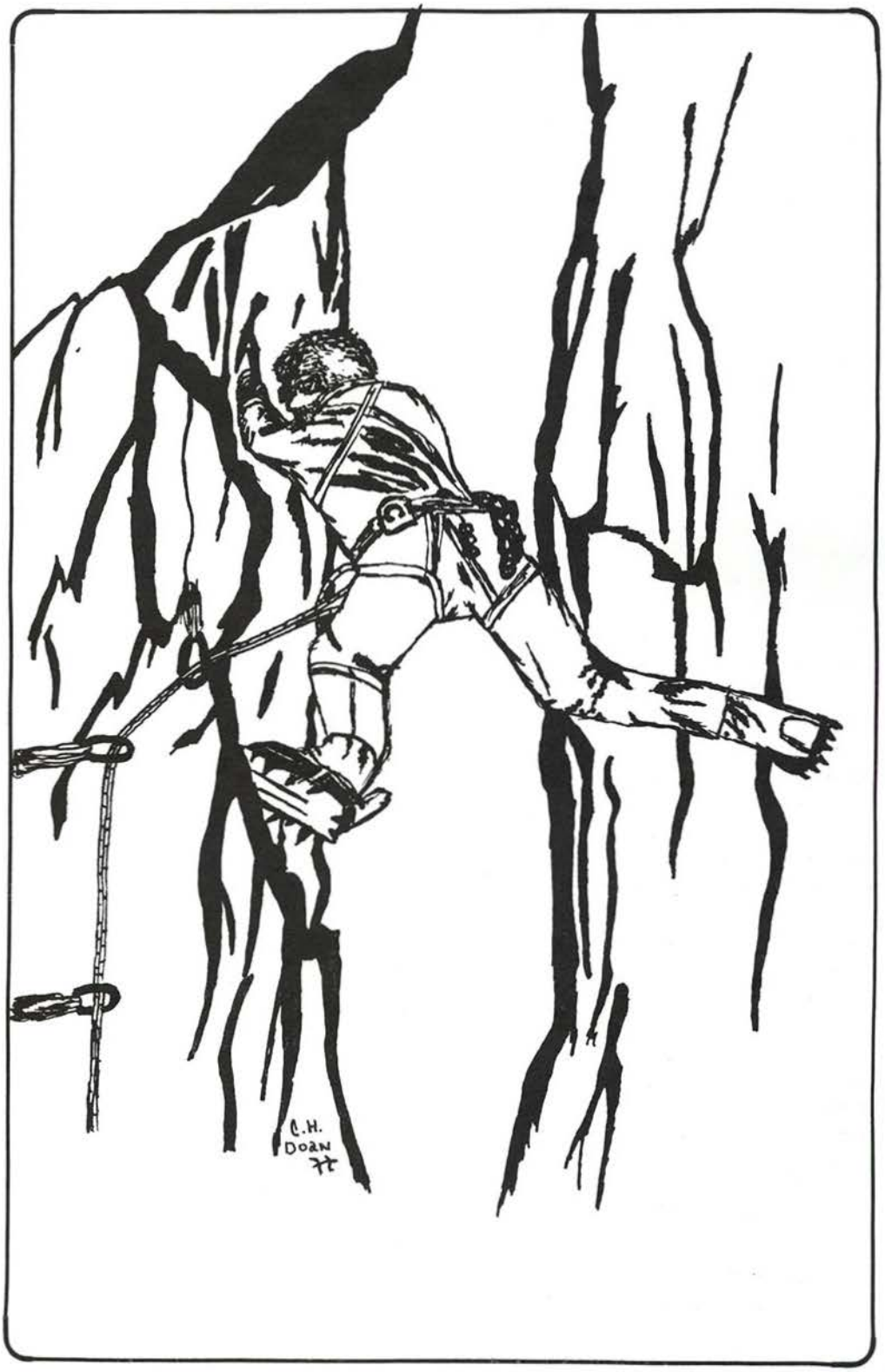
CHARLES W. McKETTA, Associate Professor of Forest Resources and economist for the Idaho Forest, Wildlife, and Range Experiment Station received this year's Outstanding Teacher Award.

LEE A. SHARP, Professor of Range Resources received the Outstanding Continuing Education Award.

JAMES A. MOORE, Associate Professor of Forest Resources and director of the Intermountain Forest Tree Nutrition Cooperative, received the Outstanding Researcher Award.

Congratulations to all of these fine people.

# Student Activities



# Natural Resources Week 1987

**by Bruce Higgins**

This year, Natural Resources Week stepped back into the past of the College of Forestry, Wildlife and Range Sciences — back to 1942. The class came back to Moscow for a reunion and participated in most of the events during the week. A high point in the week was the Students' Class of '42 social. After a day of tours and meetings the Class visited with current students of the College of Forestry, Wildlife and Range Sciences. Stories of the first Summer camp, saving the liquor store, and school days were told. These men of '42 also gave advice and wisdom which reflected their deep sense of commitment to their professions and to their friends. As everyone sat visiting, the bonds of friendship were apparent in these men, although some had not seen each other for 30 years.

One member of the class of '42 distinguished himself in a field much different than forestry, that of diplomatic service. Philip Habib, retired Special Envoy of the State Department, attended the reunion and also gave the annual awards banquet address.

A panel discussion was presented again this year, entitled "Forest Plans: The Next Steps." Kevin Bolin, Potlatch Woodlands Manager; Dennis Baird, Idaho Environmental Council; Steve Williams, Forester of Beaverhead National Forest; and Joe Kinsella, Forest Supervisor of Bridger—Teton National Forest, presented their views and answered questions from the audience. The discussion was moderated by Dr. Jo Ellen Force, Professor of Forest Resources.

Another lecture during the week was a Brown Bag seminar on "Forest Products Marketing Practices and Trade Relations to the Asian Countries: The Philippines Experience," presented by Professor Julian Meimban of the Araneta University Foundation, Institution of Forestry. Robert Muth, Social Scientist, Forest Sciences Lab, Juneau, Alaska also presented a Brown Bag seminar on "Living and Working as a Natural Resource Manager in Alaska."

Activities Day saw new heights of chili cooking, along with other delicacies. Many people stopped to eat chili, to try their hand at the "What's It?" contest, and to visit with the members of the Guidance Council. Later Friday evening, the annual Guidance Council potluck was held. Several kinds of fish were donated and barbecued by members of the American Fisheries Society. There was plenty of good eating and entertainment with the Class of '42 singing several songs.

Saturday saw the final day of Natural Resources Week begin with the Mud Run. Unfortunately, the weather did not cooperate again this year — it was a fine sunny day. The annual awards banquet finished off the week, with over 200 people attending. Philip Habib was the guest speaker, talking about his career and reflecting back over the past 40 years. Outstanding Senior of the Year Awards were Presented to:

Rachel Vandenburg,
Forest Products
Jan Pence, Range Resources
Bruce and Jeanne Higgins,
Forest Resources
Judy McDonough,
Fish and Wildlife
Bonnie Lambers,
Wildland Recreation

Jan Pence was awarded the College of Forestry, Wildlife and Range Sciences Outstanding Senior of the Year. Outstanding Teacher of the Year went to Dr. Charles McKetta, Forest Resources, for his enthusiasm and commitment to teaching and to the students. The Boot-in-the-Butt award was presented to Leon Neuenschwander, for losing the entire summer camp crew on the field final.

*Bruce Higgins, Chairman, Natural Resources Week 1987, and B.S. - Forest Resources, '87.*

# American Fisheries Society Palouse Unit, Idaho Chapter

**By Gary Asbridge**

The Palouse Unit has been busy this past school year. We are a diverse group with undergraduates, graduate students and faculty as members. A student run organization, the Palouse Unit functions to support the Idaho Chapter and American Fisheries Society in their endeavors while acting as a forum to expose students to and enhance awareness of current issues in fishery and aquatic science. We accomplish the former by assisting the Idaho Chapter with the annual state American Fisheries Society meeting held in Boise, Idaho. In addition, many of our members join Idaho Chapter committees, thereby lending their time and expertise in an effort to protect and enhance fishery resources while servicing the American Fisheries Society. Monthly program meetings, featuring a guest speaker or speakers and covering a wide range of topics, are held to enhance awareness of current fishery and aquatic science issues.

Several Palouse Unit members traveled to Boise in March, 1988, to present papers at the Idaho Chapter state meeting. Bob Griswold, Brian Hoelscher, Gary Asbridge, Cleveland Steward, Eric Wagner, Leni Oman, Nancy Markwardt, David Bennett, Christine Moffitt, and Ted Bjornn all did a great job presenting papers on a variety of topics. Leni Oman won the best student paper award with a presentation entitled "Investigations into the Epidemiology and Etiology of Strawberry Disease in Rainbow Trout."

On February 12, 1988, the Palouse Unit held its annual Wild Game Feed and Raffle. This event is a fund raiser for the Unit and was a huge success. Everyone who came had a great time and tasted many wildly prepared wild game meals. During Natural Resources Week, the Palouse Unit will help out by running the fly and spin casting contest.

back: Larry Dunsmoor, Mark Peterson, James Chandler, Gwynne Chandler, Bill Arnsberg, Timothy Fisher, Steve Rubin; front: Eric Wagner, Tevis Underwood, Robert Keith, Cleveland Steward, Alan Byrne

# Proper Fly Casting

**by Craig H. Doan**

Casting properly with a fly rod is one of the most important steps to successful fly fishing. Whether you are out for a weekend of "fun fishing" or getting down to business, good fly casting can make the difference between a few fish and your bag limit.

When you hold your fly pole, whether you are left-handed or right-handed, put the reel on the opposite side of the pole that your hand is on. Place your hand so that the weight of the pole is balanced and grasp the pole like you are shaking hands with someone.

Now that you know how to hold the pole, run enough leader through the eyelets to double the length of the pole. Straighten out the leader on the ground and hold the pole, with a straight arm, at the "9 o'clock" position without snapping the line behind you.

Practice with only double length of leader until you are confident of casting and confident of your style. Then, when you want more leader out, as the pole is in the "12 o'clock" position, strip leader from the reel with your free hand. Hold onto the extra leader until you reach the "10 o'clock" position, then let all of the extra leader go.

After you have practiced casting on land for awhile, try to place the leader on water as smoothly as you can. Add a fly to your leader and you're ready to go fishing!

# Forest Products

It's been another busy year for the Forest Products Club. They owe a special thanks, in part, to last semester's officers: Kelly Scott — President, John Berreth — Vice President, and Lee Badger — Secretary/Treasurer. Also a very special thanks to advisor Bob Govett for helping with club activities. A warm congratulations should be extended to this semester's officers: Pat Farrell — President, Ken Pratt — Vice President, and Mark Finn — Secretary/Treasurer. Congratulations to the new Products advisor Tom Gorman.

As the newest member of the faculty, Tom hopes to help the club become even more active. He wishes to aid Forest Products Club in realizing their goals by offering help in organization. He also hopes to ease initial contacts between the club and guest speakers.

A number of events have occurred to make this year exciting. The annual, infamous Pig Roast occurred on May 2, 1987. This informal potluck picnic occurs annually in May at Harry Lee's home. The club provides the pig, roasted over an open pit, and the beverages for a number of students, faculty, staff, alumni, and their families. Of course, no picnic is complete until you get the crew together for a game of volleyball.

The club has also sponsored a number of speakers. At one meeting, Associate Dean for Academics, Dr. Fazio, spoke to offer suggestions for improved club activities. Other speakers have included Tom Peterson for Caterpillar.

Nineteen eighty-seven was a good year for Forest Products. More importantly, we are looking forward to upcoming events in 88'. The annual Pig Roast will be held on May 1. A tour for the placement center is planned for March 9. The club will be attending the Intermountain Logging Conference and Equipment Show April 8-9 in Spokane, and a number of speakers are still planned, with dates to be determined.

Guozhi Li, Paul Miller, Mike Hughes, Cassie Stevens, Jon Berreth, Carson Bosworth, Dennis Scott, Richard Folk, Kelly Scott, Arnoldo Jelvez, Mark Finn, Pat Farrell, Tom Gorman, Ken Pratt, Darwin Baker, Heok Choh Sim

# 1988 FORESTER STAFF


David Gariepy — Wildland Rec. — Business Mgr.

Robin Creath — Range Resources — Word Processing

Greg Wooten — Wildlife — Layout & Design

Cassie Stevens — Forest Products — Woodland Elf

Rich Merkel — Wildlife — Photographer

Chris Maranto — Forest Resources — Woodland Elf

Cindy Sills — Wildlife — Editor

Joe Ulliman — Advisor

Sarah Topp — Wildland Rec. — Editor

Not pictured: Craig H. Doan - Artist

# Range Club News

**by Lynn Pence (Secretary/Treasurer)**

The University of Idaho Range Club started out small this year with only five members. Many of our members did not return this fall semester since they were completing co-op obligations or catching the unusually big fire season. We had our annual fall BBQ Bash, ate steaks, and had a great time with volleyball games and friends.

The Club is sponsoring the Plant Identification and Range Exam team (one and the same) for the Identification Society of Range Management meeting in Corpus Christy, Texas this February. The team members are Alan Shepherd, Pat Ryan, Lynn Pence, Jay Pence, and the coach is K.C. Roscoe. The team has been practicing since October and plans on making a good showing for the University of Idaho. The Plant Identification competition tests the participants' knowledge of two-hundred important range plants across the United States. Their scientific names, with correct spelling knowledge of families, and growth habitats, must be known to receive good scores. The Range Comprehensive exam tests the students' knowledge on all facets of range management from calculating proper use to ecology and fertilizer application. Funds were received for the trip from the Dean's office and proceeds from a very successful raffle. The Range Club is also going to have a spring BBQ Bash when the weather warms up. Three members will return from their fall semester reprieves, so we are looking forward to more power and more range faces for our future activities.

*Lynn Pence is a junior in Range Resources.*

back: K.C. Roscoe, Scott Henderson, Alan Shepherd, Lynn Pence, Steve Bunting; middle: Jay Pence, Pat Ryan; front: Heidi Diestelhorst, Barbara Wight, Jim Kingery

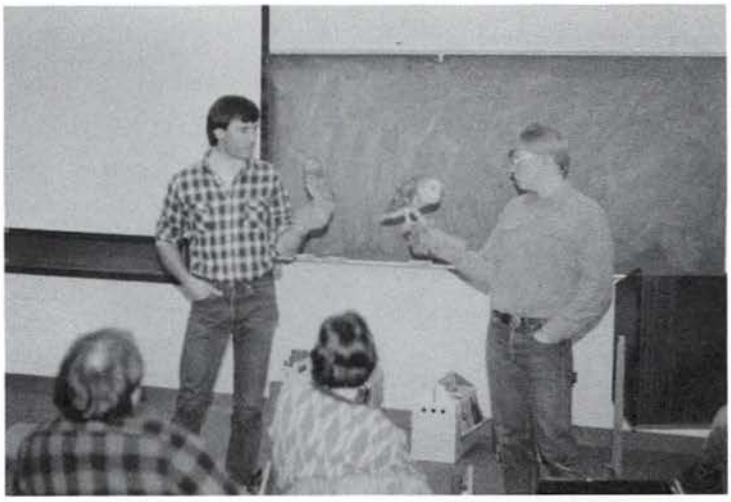
# Society of American Foresters/ Associated Foresters

SAF sponsored the college-wide faculty/student picnic at Robinson Lake Park the first week of school. This is an excellent opportunity for new students to get acquainted with faculty and other students,and gives returning students a chance to share summer experiences. A friendly softball game and lots of food grilled out were the main attractions on a warm summer evening.

The following are sketches from SAF/AF activities for the year:

- Sent two representatives to the National SAF conference in Minneapolis, Minnesota in October.
- In November, student chapter representatives attended the Palouse Chapter meeting in Pullman where Dr. Raintree spoke on agro-forestry. The annual Thanksgiving Day Turkey Draw helped the club raise funds and gave away two turkeys.
- Free food was offered to help promote new and old members' involvement in SAF with a Pizza Feed in December.
- A Prof & Stein potluck dinner/sledding party at Ron and Susan Mahoney's house in January was a big success. A great hill provided a 1/4-mile toboggan run and about 60 people attended college-wide.
- There was a section meeting of the Inland Empire SAF in Post Falls in March, and the student chapter will be attending a Western Forestry Conservation Association conclave in Missoula in April.
- The student chapter's most popular activity of the year will be as co-sponsors of the annual Logger's Meet with Washington State University in April. This logging sports meet features competitions in such muscle and sweat games as birling logs and axe throwing.


Mark Mousseax, Peggy Stephenson, Dan Johnson, Jon Berreth, Ken Nigren, Mike Schwarts

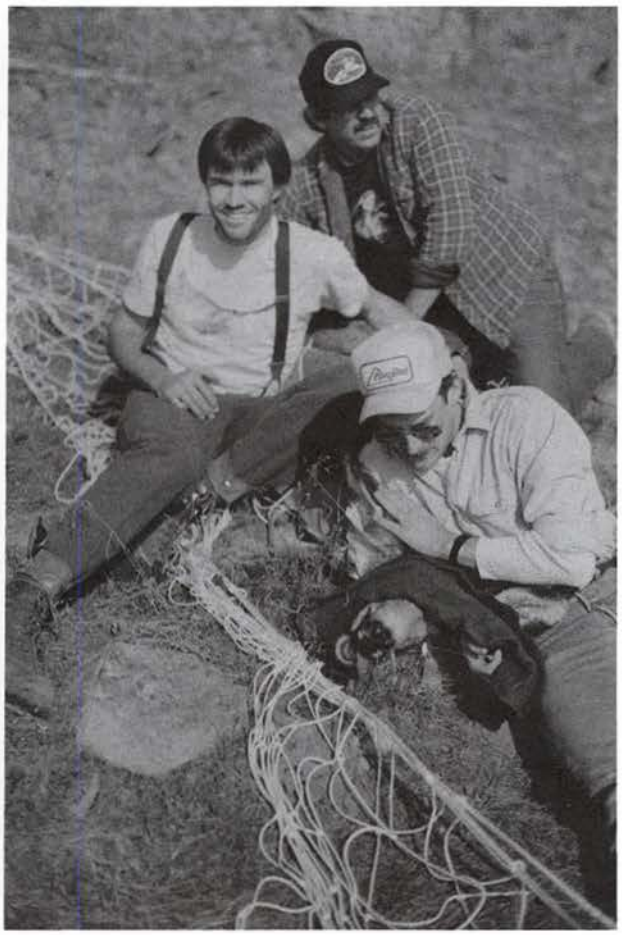



*The difference between stumbling blocks and stepping stones is the way we use them.*

— Anonymous

*"It is the true amateur, the lover of his subject, who is most likely to become the real expert in it."*

— Konrad Lorenz

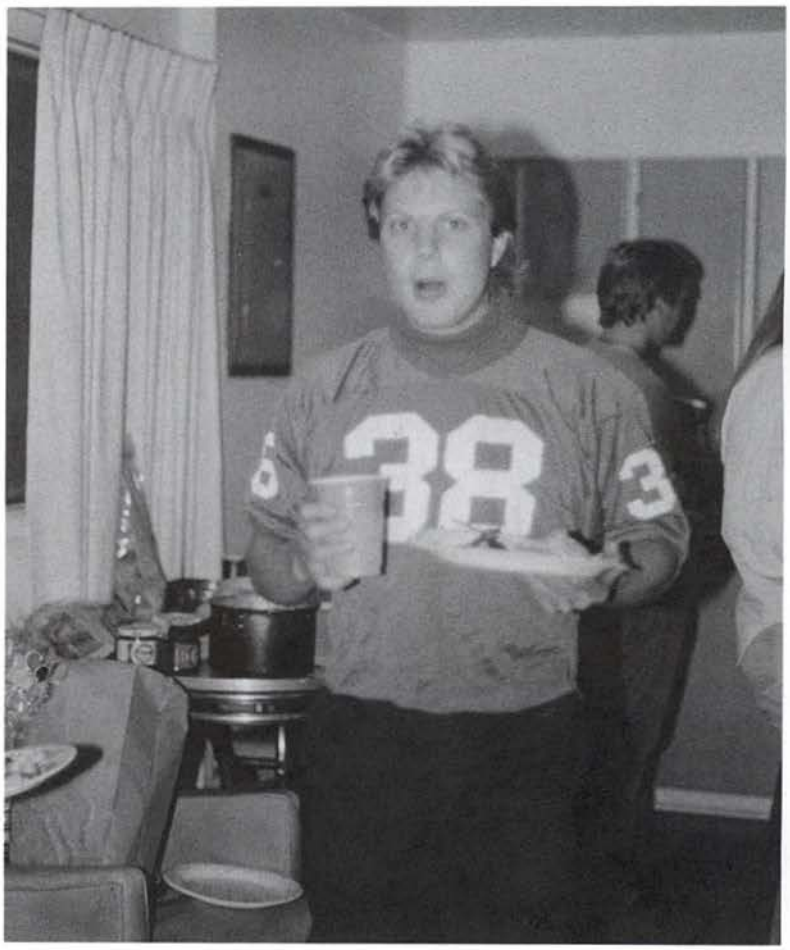


*Nothing great was ever achieved without enthusiasm.*

— Anonymous

*To live only for some future goal is shallow. It's the sides of the mountain that sustain life, not the top.*

— Robert M. Pirsig



# Student Affairs Council

The Student Affairs Council (SAC) functions as a formal link between the students and faculty of the College of Forestry, Wildlife and Range Sciences. Comprised of student representatives from each department, SAC affords students the opportunity to voice academic concerns and complaints, and to offer suggestions for pending faculty/administrative actions. Essentially, Student Affairs Council is a vital communication line which has the potential to benefit everyone in the College.

SAC also sponsors publicity and promotional events for FWR. Although off to a late start in the Fall, plans for College of Forestry hats and T-shirt sales and the Annual Pancake Day were underway soon after new student representatives were elected.

The calendar, along with the start of the new semester, flipped over with the Annual Pancake Day. This year's Saturday community breakfast feed was held downtown at the Moscow Community Center. Featured flapjack flipper, Dr. Joe (Photo Joe/Sourdough Joe) Ulliman and his famous sourdough pancake recipe made the morning a success. Accompanying these fabulous flapjacks were sausages, juices, coffee and tea. The turnout was so great and the customers so satisfied, we may do it again before the semester is out!

Plans for Natural Resources Week are also underway. SAC is sponsoring movies and lectures, a chili cook-off, tug of war, and other forestry contests yet to be determined. A pot luck dinner will replace the Awards Ball this year, and the awards will be presented.

Thanks to this year's SAC officers:

Brenna Evans — President
Jan Pence — Vice President
Cindy Sills — Secretary/Treasurer

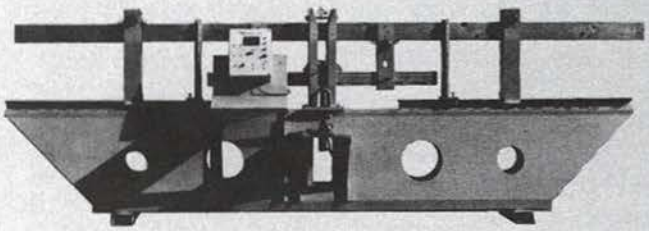
back: James Fazio, Dan Johnson, Richard Schaefer. Alan Shepherd;
front: Brynna Evans, Lynn Pence, Jeff Bolln, Patrick Hylton

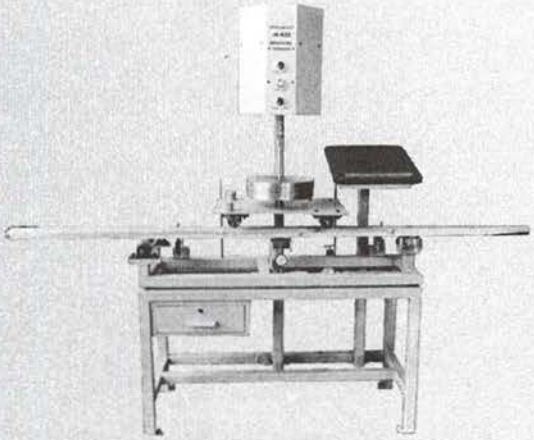


# MACHINE STRESS RATING

**CLT**
**Continuous Lumber Tester**

**Model 312**
**Bending Proof Load Tester**





**Model 440 Flatwise Dead-Load Lumber Tester**

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**Model 312 — Bending Proof Load Tester —** Measures edgewise bending E and verifies strength in MSR quality control. Load cell force measurement. Direct digital E and force readings. Axial and transverse, rotational & translational degrees of freedom. Roller bearings at load points reduce friction. Two independent force calibration means assure accuracy.
**Model 440 — Flatwise Dead-Load Tester —** Economical measurement of flatwise bending E for laboratory use, calibration, and quality control applications. Push-button, air-powered control of test weights. Rapid, convenient operation.

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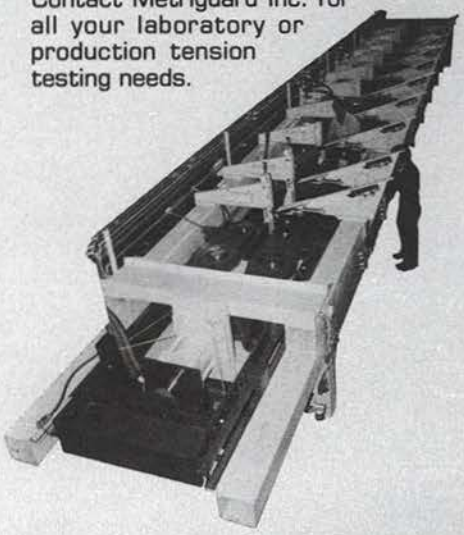

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# Wildland Recreation Management Association

**by Sarah Topp**

"Wreckies" started out the fall semester with a Brown Bag lecture/slide show with Bob Ratcliffe sharing his experiences in "Life as a Ranger in the Yukon, Alaska," and "Wilderness Management in Australia." The club continued work on a project improving McDonald Elementary School. A snag is being donated by Bonnie Goodrich, which should be in place in front of the school later this year.

New Wildland Recreation students spent an entertaining evening getting to know the faculty through slides and the sharing of personal experiences and professional growth. Many laughs were had by all as our professors gave us a peek at their college lives.

Spring is the time students begin looking at summer jobs. Thus, another Brown Bag was held — this one featuring Bob Louden from Alaska Sightseeing. A visit from Exploration Cruise Lines recruitment is planned for later this semester, and one more Brown Bag is scheduled with John Edwards on the National Outdoor Leadership School.

Spring is also when area high school students "Explore Idaho" in search of the ideal university. The Wreckies set up a display in the Kibbie Dome, and prospective students showed lots of interest in our department's program and activities.

Moscow's annual Mardi Gras parade benefitted immensely from our club's entry this February — "Wildman Recreation — All Walks of Life."

About a dozen students formed a "precision" backpacking drill team complete with a survivalist backpacker, a mountain climber, scuba diver and two forest rangers. We had a lot of fun,

from top: Ed Ohlweiler, Steve Szewc, Dan Kencke, Amy Estes, Bart Smith, Bonnie Goodrich, Jeff Cook, Jay Scott, Wade Brown, Greg Aurand, Debbie Wilkins, Amy Adams, Sarah Topp, Jody Gantz, Marsha Moore

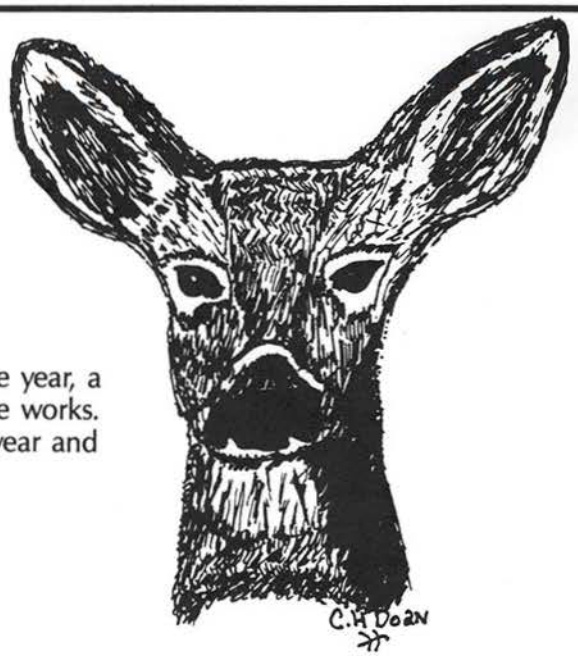
*Nature doesn't take only one path to reach a goal . . . neither should man.*

— Author unknown

even though we somehow escaped public recognition.

Two big events for Natural Resources Week are being sponsored by the Wildland Recreation Management Association again this year. The always popular Moscow Mountain Mud Run, a six-mile run up Moscow Mountain, gives everyone an opportunity for good clean fun and a custom-made T-shirt to commemorate the event. Natural Resources Week also features a celebration of our mother earth. Earth Day '88 is sure to provide more fun in the sun with music, talks and a frisbee throw on the campus lawn, followed by films in the evening. To top off the year, a Wreckie float trip is in the works.

We've had an active year and a great time!



# Wildlife Society

**by Cindy Sills**

The University of Idaho's forest had an old deer enclosure which needed to be torn down and disposed of, so Jeff Day, president, said that we would take care of it. It was a beautiful September day—many helping hands were there. Joking and teasing started up and continued into Monday's classes. This was our starting activity of the semester.

We volunteered for almost two months worth of weekends at game check stations starting in September. We had a great turnout — the sign up sheet was full. We checked various stations for elk and waterfowl within about a two hour radius. In October and November, we split open duck gizzards to gather data for the Fish and Game Department to determine lead vs. steel shot use. Last I heard, 31% lead shot was still being used.

Wildlife society dissecting waterfowl gizzards for lead shot

Bird boxes were built one January weekend for kestrels, bluebirds, chickadees and owls to go up in the school arboretum. The following weekend was spent climbing trees to place the housing.

In February, one of our members, Jeff Bollin, who is licensed in falconry, gave a seminar and demonstration on behalf of the Rapture Rehabilitation Club. The RRC is a cooperative effort between Washington State University and the University of Idaho. A red-tailed hawk, a kestrel, and a barn owl were brought in live. We had a great time, and at the end of the week we were able to watch and participate in the handling and flying of the red-tailed hawk and barn owl.

A field trip to radio collar mule deer on Colville Indian Reservation received an excellent participant turnout. Two vans full of Wildlife students and Wildlife Society members went with Professor James Peek, Ph.D.

We met "Steve" who had a real cowboy essence. He instructed us: "The deer run into the net; you get them down and hold them down. Don't hurt the deer, and stay hidden until they are snagged or you'll scare them."

A helicopter herded scant numbers of deer towards the net for several hours. It was a bright, warm, sunny day so waiting was a pleasure. The net was across a gulley with a clump of trees below and above providing hideouts for the deer. Thirty-four percent of the expected tagging resulted in this snowless area. None of the Wildlife group had participated before so all was new and exciting. Much to Steve's and everyone else's relief, the students were kicked more than the deer were pushed around.

That evening Dr. Peek gave a slide show of his trip down the Thelon River, Thelon Game Sanctuary.

Sunday we relocated for some attempts on white tailed deer. Due to the warm weather and snow melt, the deer had already left the area. With a flip of a coin as the ticket, a helicopter ride was awarded to the winning female student (there were too many guys and Steve didn't want to take that long.) Ladies, sometimes chau-

*It is never too late to be what you might have been.*
— George Eliot

vinism works for you; too bad guys! I know, I won the flip of the coin over the only other female present. It was a "wicked" ride!

Our stay was completed after some "jawin' " between our group and some participating Colville residents.

On to future events, during Natural Resources Week we will again hold our annual Chili Cook-off. Usually, plenty of empty stomachs are filled up and much cool water is taken in! A field trip to Craig Mountain is planned with Dr. Peek and the Wildlife Management class. All in all, it has been a productive, fun and exciting year!

back: Jeff Bolln, David Silcock, Jeff Day, Keith Billi, Tom Dresser, Bob Dice, Mike Schrage, Ray Guse, Troy Hansel; front: Greg Wooten, John Lamb, Keith Sterling, Roy Kenner, Carolyn Steiner



# Earth Day 1987

**by Ed Ohlweiler**

There was a certain unexplainable enthusiasm in the air on April 22, 1987.

What is that?

Students raised their brows at the unexpected interruption of their daily college routine. Ten years ago, a public address system in the center of a university campus would have seemed perfectly in place. Today, however, students are awestruck by any attempt to exercise the first amendment. Had Earth Day '87 failed in every other respect, it still would have been successful revealing that there are, in fact, alternatives to apathy.

The point is that Earth Day did get across a myriad of conservation viewpoints by promoting a universal motif — fun in the sun. The fun came in the form of a guitar performance by Eric Engelbretson, and the Moscow Free Music Society, a giant bouncing Earth ball, and dozens of elementary school kids reading essays on "What the Earth means to me." Skits by the Wreckie Guild of Actors were presented, and Mother Earth produced some great weather. What better way to honor our amazing planet than an outdoor celebration of life on a sunny, spring day?

Throughout the day, various speakers added their blocks to the pyramid of environmental awareness, beginning with an inspirational keynote rally by Dean Fazio. The theme for the day, however, went beyond environmental awareness and tried to identify some solutions we can implement through personal actions. The speakers were as follows:

Jim Fazio — Overview of the Earth Day movement
Bob Mosely — Research Natural Areas
Leigh Robartes — the Navajo Relocation Plan
Mary Butters — Palouse Hanford Watch
Mark Solomon — open range grazing
Gerry Snyder — Idaho Conservation League
Friends of Mallard Larkins
Charles Bower — conservation farming
Chris Englehardt — Moscow Recycling Board
Jane Guido — Palouse SANE

Immediately following the activities, which lasted from 10:00-2:00, garbage bags were handed out to volunteers for cleaning up trash in the UI Arboretum (all glass and aluminum was recycled).

Earth Day '87 came to a close with evening audio/visual presentations in the College of Forestry. The presentations included a slide-show by the Friends of Mallard Larkins, the controversial Canadian film, "Acid Rain: Requiem or Recovery?", a video on the management and protection of western riparian stream ecosystems, and the movie "Jeremiah Johnson."

All in all, upwards of 100 participated, viewer turnout was high,and a genuine attitude of goodwill was achieved.


*Edward Ohlweiler is a senior in Wildland Recreation Management.*

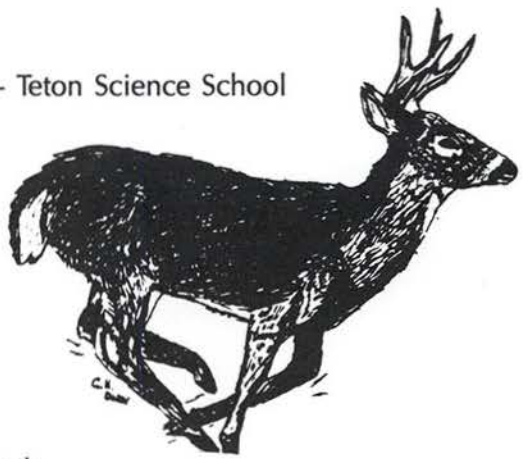
## FUTURE CONTINUING EDUCATION COURSES

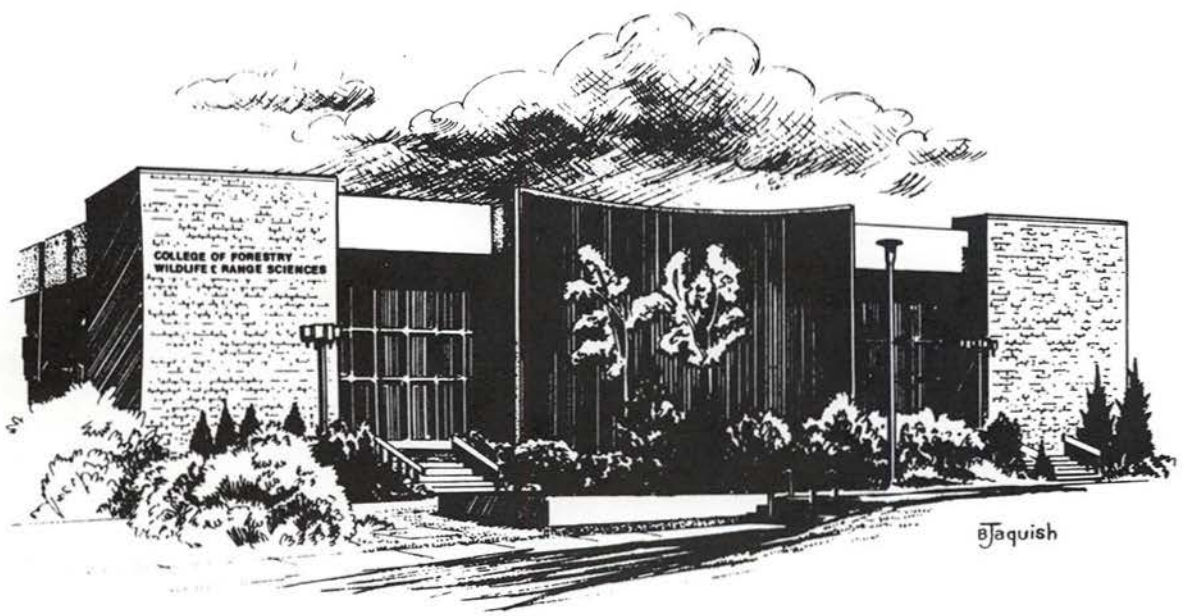
*Continue your education with us at the College of Forestry, Wildlife and Range Sciences! Take a short course, join us for a workshop, attend a symposium, or participate in the enrichment series planned for the coming year. Share our excitement with the many constituents we serve, from natural resource professionals to the general public, from energetic senior citizens to youngsters, from locals to those who come from across the country or around the world. Come to our campuses or field stations — we will offer courses in Moscow, Clark Fork, McCall, Boise, Twin Falls, Spokane, and elsewhere.*

*For more information call Dr. Penny Morgan at (208) 885-7400 about any of these courses or write her at the College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, ID 83843.*

| | |
|---|---|
| January 16-17 | Animal Tracks in the Snow — Clark Fork |
| February 27 | Beginning Fly Tying and Casting — Clark Fork |
| March 26-27 | Waterbirds — Clark Fork |
| March 30 | Shade Tree Workshop — Moscow |
| April 9 | Introduction to Falconry — Clark Fork |
| May 7 | Lakes and Streams of the Northwest — Clark Fork |
| May 15 | Spring Mushrooms — Clark Fork |
| May 28 | Urban Forestry and Ornamental Trees — McCall |
| June 4 | Mushrooms of the McCall Area — McCall |
| June 6-10 | Grizzly Bear Biology, Ecology, and Management — Yellowstone |
| June 11-12 | Elk of Yellowstone: Biology and Ecology — Yellowstone |
| June 13 | Wellness Testing — McCall |
| June 14-16 | Eagles and Hawks of the Greater Yellowstone — Teton Science School |
| June 14-18 | Large Mammals of Yellowstone — Yellowstone |
| June 25-26 | Birds of Prey/Peregrine Recovery Program — McCall |
| June 25-28 | Field botany: Flora of the Tetons — Teton Science School |
| June 26 | Ethnobotany — Clark Fork |
| June 27-30 | Perception: Keeping A Field Journal — Teton Science School |
| July 6-8 | Fire Ecology of the Greater Yellowstone — Teton Science School |
| July 10-16 | Elderhostel: Wild Country Botanizing — Clark Fork |
| July 17-23 | Elderhostel: Wild Nature of Idaho — McCall |
| July 18-22 | Understanding Animal Behavior — Teton Science School |
| July 25-28 | Pattern in Nature — Teton Science School |
| July 30 | Early History of North Idaho — Clark Fork |

| | |
|---|---|
| July 30 | Lakes and Streams of Central Idaho: Ecology and Management Challenges — McCall |
| August 8-12 | Nature Illustration — Teton Science School |
| August 8-9 | Increasing Human Effectiveness — McCall |
| August 12-16 | Landscape Watercolor Painting — McCall |
| August 20-21 | Geology of McCall and Central Idaho — McCall |
| TBA | Alpine Ecology — Teton Science School |
| TBA | Natural History of Yellowstone Grizzlies — Teton Science School |
| TBA | River Channels — Teton Science School |
| August 27-28 | Wildland Photography — McCall |
| August 28 | Wildlife Photography — Clark Fork |
| September 10 | Native Ornamental Trees — Clark Fork |
| September 25 | Fall Mushrooms — Clark Fork |
| October 1 | Forests of the Northern Rockies — Clark Fork |
| October 15 & 16 | Fossil Collection and Geologic Tour of the Lake Pend Oreille Area — Clark Fork |
| November 5 | Herbs and Herb Crafts — Clark Fork |
| June 5-9 | Grizzly Bear Biology, Ecology and Management — Yellowstone |
| June 10-11 | Elk of Yellowstone: Biology and Ecology — Yellowstone |
| June 13-17 | Large Mammals of Yellowstone — Yellowstone |






FWR Building
University of Idaho

# 1987-88 Student Directory

## Forest Resource Management

### Freshmen

Gengoux, David Claude
Joosten, Daniel Chris
Kendall, Thomas E.
Knopp, Perry Lee
Orr, Robert James
Roberts, Frank M.
Schwartz, David Allen
Sterling, Michael J.
Thorp, Paula Jeanne
Wincentsen, Tim James
Wolter, Jeffrey Gordo

### Sophomores

Foster, Paul Charles
Schultz, Robert Dean
Sheets, Nathan Dahle
Whitmer, John Charles
Wiseman, Raymond Russ

### Juniors

Adams, Craig David
Carroll, Buddie Ray
Danly, Gregory R.
Dyer, Wiley David
Manion, Douglas U.
Meldazis, Matthew E.
Moore, Henry Jr.
Noggles, Rick Thomas
Orr, Gary Bruce
Schwartz, Michael J.
Sutton, Brian Michael
Wilkins, Deborah Sue

### Seniors

Avila, Roberto
Bott, Kevin L
Brooks, Ervin Jessie
Bruce, Scott Michael
Cleavenger, Richard W.
Frank, Harold Jr.
Glazier, Craig R.
Holt, Sandra Lynn
Johnson, Daniel G.
Lilly, Linda M.
Maranto, Joseph Chris
Miller, Marie
Moore, Daniel Stephen
Mousseaux, Mark R.
Nunez, Cornejo Luz M.
Nunez, Hernandez D.
Nygren, Ken Alan
Reyes, Chirinos Jose
Shaw, Terry Mac
Stephenson, Peggy L.
Stewart, Mark A.
Vogt-Schaller, Ann L.
Zelaya-Mejia, Monico

## FISHERIES

### Freshmen

Boone, Evan Armstrong
Courtney, Michael C.
Crabb, Edwin Collins
Liter, Mark
Maskill, Mark Gerard
White, Jody Scott
Wicks, Craig Thomas

### Sophomores

Brown, Rodney Lane
Hale, Mark Allen
Morris, Robert C.
Petersen, Marc R.
Reich, Charlene May
Warren, Robert F.
Whipple, Andrew James
Willis, Donald Ray

### Juniors

Averill, Daniel Kent
Curet, Thomas Stuart
Diehm, Rodney Lane
Hemstrom, Steven L.
Johnson, Lee Warren
Kammeyer, Steven Todd
Kress, Albert Eugene
Lanier, Roger Wayne
Lee, Steven Robert
Rice, Charles Mack
Riggers, Brian W.
Smasne, William R.
Sutton, Brian Michael

### Seniors

Barrett, Lawrence T.
Bourbon, Kent George
Dresser, Thomas James
Hanft, David Lee
Holderman, Charles E.
Johnson, Eric Eddie
Kibby, Michael John
Klontz, Dannette I.
Lepla, Ken Brian
Rayborn, Richard C.
Spurgeon, William F.
Stutz, William Ronald

## Wildland Recreation Management

### Freshmen

Achabal, Steven J.
Buffa, John Garrett
Castillo, David A.
Flood, Kevin Francis
Gariepy, David S.
Hirschi, Guy Ray
Hudson, Steven Zae
Hunter, Jonathan A.
Hutchinson, Karen J.
Lute, Sally Lorraine
Pike, Sandra Lynn
Soliz, Veronica
Summerkamp, Shawn M.

### Sophomores

Calhoun, Henry Scott
Estes, Amelia Susan
Ferbrache, Thomas C.
Gust, Lisa Lee
Knudson, Jeffrey G.
Lincoln, Kevin Lewis
Ogden, Dee Anne
Raney, Lisa Ann
Reynolds, Adare C.
Scott, Jay D.
Szewc, Stephen P.
Topp, Sarah Emily
Williams, Todd M.

### Juniors

Adams, Amy Elizabeth
Adams, David Lee Jr.
Gants, Jody Marie
Kaltenborn, Bjorn P.
Kencke, Daniel Lee
Moore, Marsha Eileen
Peters, Christine M.
Reingold, Benjamin L.
Ristau, Shane C.
Smith, Bartholomew W.
Sutton, Brian Michael
Welch, Tracy Bryan
Wilkins, Deborah Sue

### Seniors

Brown, Marvin Wade
Edwards, John Louis
Goodrich, Bonnie J.
Gordon, David Scott
Harvey-Marose, Kevin
Hollander, Randall J.
Johnston, Kenneth A.
Klimek, Dennis Joe
Kline, Chad
Lawson, Sharon Louise
Markow, Stuart
Ohlweiler, Edward, C

## WILDLIFE

### Freshmen

Bethke, Brian Lynn
Black, Michael, Bought
Bosworth, Travis M.
Bradley, Jon Michael
Crabb, Edwin Collins
Dunnigan, James Louis
Durbin, David Paul
Engle, Kenneth David
Flodin, Daniel Wayne
Fortner, Bobby Samuel
Giller, Gary John
Glover, Dave Blaine
Grant, Travis Leroy
Grubb, Erik Byron
Hurd, Lori Anne
Lamb, John Allen
Leavitt, Steven M.
Martin, Harold Edward
Meldazis, Dan Edward
Metz, Eugene Barney
McDowell, Heather D.
Nordin, Gregory J.
Ramsey, Cecil Howard
Scott, Marcia Ann
Silcock, David Burton
Sills, Cynthia
Sisco, Gary Robert
Steiner, Carolyn Sue
Stirling, Keith Adam
Teutsch, Howard Ralph
Truscott, Douglas J.
Walchi, Raymond D.
Wooten, Gregory Lee

### Sophomores

Bizak, Karen Elizabeth
Boyer, Eric David
Butts, Todd Allen
Fuesting, Mary Beth
Holliday, Barbara N.
Jeffries, Adam Shane
Johnson, Christopher
Limandri, Stefani J.
McNeill, Steven W.
Michniewicz, Tracy J.
Schulz, Robert Dean
Shepherd, Jay Floyd
Steiner, Ronald Lee
Tiller, Brett Lelan
Turley, Brett Alan
Walo Matthew David
Waterstradt, Kurt E.
Zebley, Dawn Marie

### Juniors

Bogar, Ricky A.
Billi, Keith Alan
Dice, Robert I. III
Guse, Raymond Dennis
Huddleston, Lewis M.
Hylton, Iven Patrick
Imel, Kevin Mark
Kennedy, John F.
Pope, Larry Earl Jr.
Radcliff, Shawn W.
Remsen, Christopher J.
Schrage, Michael W.
Sherupski, Glenna M.
Smasne, William R.
Steffens, Timothy P.
Wardle, Lorin Lewis
Whitmer, David Robert

### Seniors

Batten, Sean Isaac
Bear, David Lambert
Bolln, Jefferey John
Day, Jeffry Neil
Deslaurier, Gregory C.
Dresser, Thomas James
Evans, Brynna Kathlee
Farley, Michael R.
Flagler, David Roy
Hansel, Troy Edward
Jenicek, Jamie Lee
Kinner, Roy James
Lesh, Tamara Dee
Little, Robin Michael
Merkel, Richard H.
Reinecker, Scott T.
Sawle, Wayne Dale
Shepherd, Alan Boyd
Sherer, Jeffrey Allen
Ulliman, Mark Joseph

## Undeclared

### Freshmen

Bradshaw, Rustan K.
Butterfield, Christopher
Dunn, Kasey Edward
Erickson, Steven D.
Griswold, Patrick J.
Jacobson, Klint Kerry
Jensen, Signe Kirsten
Rasmussen, Clinton W.
Wirth, Xan Marie

### Sophomores

Bair, Frank Jonathon
Norwood, Terry Gene

### Seniors

Sellers, Edward M.


**RANGE RESOURCES**

**Freshman**

Cannon, Kim Lee
Creath, Robin Lynn
Hansel, David Michael
Minor, Andrea Jean
Strope, Jacqueline R.
Wannawong, Su P.

**Sophomores**

Burge, Elwood Ray Jr.
Hamdi, Mohamed N.
Samet, Youssef

**Juniors**

Green, Donna Lee R.
Lebusa, Cecilia M.
Pence, Jay Thomas
Pence, Lynn Adele
Pope, Larry Earl Jr.
Williamson, Kaye M.

**Seniors**

Chistobal, John M.
Eno, Marlene Kay
Henderson, Scott J.
Johnson, Daniel G.
Ntlale, Francis N.
Ryan, Thomas Patrick
Sefika, Phakiso
Shepherd, Alan Boyd

**Forest Products and Pulp**

**Freshman**

Baier, Charles, R.
Hemly, Kyle David
Schaefer, Richard M.
Scott, Dennis James
Stevens, Cassandra A.

**Sophomore**

Brede, Anthony Lloyd
Govett, Linda Marie
Hansen, Eric Neal
Kaes, Michael Lee
Peterson, Andrew C.

**Juniors**

Badger, Lee Michael
Booth, Reginald John
Bosworth, Carson D.
Finn, Mark E.
Pratt, Kenneth L.
Sherwood, Richard M.

**Seniors**

Baker, Darwin Lee
Berreth, Jonathan E.
Farrell, Patrick J.
Koon, Anthony Glenn
Kulm, David Scott
McNally, Steven K.
Reggear, Michael H.
Scott, Kelly Francis

# GRADUATE STUDENTS

## FISH RESOURCES

| Student | Type Degree |
|---|---|
| Arnsberg, Billy | M.S. |
| Asbridge, Gary | M.S. |
| Blakely, David | M.S. |
| Burton, Douglas | M.S. |
| Byrne, Alan | M.S. |
| Chandler, James | M.S. |
| Chase, Donald | M.S. |
| Dunsmoor, Larry | M.S. |
| Fisher, Timothy | M.S. |
| Good, James | M.S. |
| Griswold, Robert | M.S. |
| Harshbarger, Thomas | Ph.D. |
| Hatch, Douglas | M.S. |
| Hoelscher, Brian | M.S. |
| Keith, Robert | M.S. |
| Markwardt, Nancy | M.S. |
| Meyer, Gwynne | M.S. |
| Myers, Ralph | M.S. |
| Ralonde, Raymond | M.S. |
| Robertson, Cynthia | M.S. |
| Rubin, Stephen | M.S. |
| Steward, Cleveland | Ph.D. |
| Strach, Russell | M.S. |
| Wagner, Eric | M.S. |
| Welt, Marc | M.S. |

2 Ph.D. students
23 M.S. students
25 students

## WILDLIFE RESOURCES

| | |
|---|---|
| Ackerman, Bruce | Ph.D. |
| Akenson, Holly | M.S. |
| Bell, Jack | M.S. |
| Budeau, David | M.S. |
| Byrd, G. Vernon Jr. | M.S. |
| Casebolt, David | M.S. |
| Cassirer, Elizabeth | M.S. |
| Crabtree, Robert | Ph.D. |
| Destefano, Stephen | Ph.D. |
| Fulmer, Kathleen | M.S. |
| Gleisner, Donna | M.S. |
| Griffith, Dennis | Ph.D. |
| Hayward, Gregory | Ph.D. |
| Johansen, Ole | M.S. |
| Jones, Jeffrey | M.S. |
| Keay, Jeffrey | Ph.D. |
| Kelly, Brian | M.S. |
| Leban, Frederick | M.S. |
| Maccracken, James | Ph.D. |
| Maganga, Samwel | Ph.D. |
| Martin, Robert | M.S. |
| Meints, Daryl | M.S. |
| Miquelle, Dale | Ph.D. |
| Monda, Matthew | Ph.D. |
| Musil, David | M.S. |
| Naylor, Kirk | M.S. |
| Pauley, George | M.S. |
| Robertson, Mark | M.S. |
| Rohlman, Jeffrey | M.S. |
| Unsworth, James | Ph.D. |
| Vales, David | Ph.D. |
| Van Deventer, John | Ph.D. |
| Volsen, David | M.S. |
| Wakkinen, Wayne | M.S. |

13 Ph.D. students
21 M.S. students
34 students

## FOREST PRODUCTS

| | |
|---|---|
| Carey, Patricio | Ph.D. |
| Cleavenger, Richard | M.S. |
| Etiegni, Lazare | Ph.D. |
| Folk, Richard | Ph.D. |
| Green, Daniel | Ph.D. |
| Hughes, Michael | M.S. |
| Jelvez, M. Arnaldo | Ph.D. |
| Khattabi, Abdellatif | Ph.D. |
| Kim, Wae-Jung | Ph.D. |
| Li, Guozhi | Ph.D. |
| Meimban, Julian | Ph.D. |
| Mount, Michael | M.S. |
| Ritter, David | Ph.D. |
| Shety, Geetha | M.S. |
| Sim, Heok | Ph.D. |

11 Ph.D. students
4 M.S. students
15 students

## WILDLAND RECREATION MANAGEMENT

| | |
|---|---|
| Bajimaya, Shyam | M.S. |
| Bean, Mary | M.S. |
| Browning, James Alan | M.S. |
| Castillo, Lizeth | M.S. |
| Chavez, Todd | M.S. |
| Dankel, David | M.S. |
| Domino, James | M.S. |
| Dresser, Mary Lou | M.S. |
| Eckberg, Jill | M.S. |
| Emmendorfer, Marianne | M.S. |
| Hajib, Said | M.S. |
| McConnell, Douglass | Ph.D. |
| Miller, Tracy | M.S. |
| Pascale, Joan | M.S. |
| Ratcliffe, Robert | M.S. |
| Sanyal, Nick | Ph.D. |
| Scanlin, Julie | M.S. |
| Strassman, Judith | M.S. |
| Tangen-Foster, James | Ph.D. |
| Timko, Sharon | M.S. |
| Tynon, Joanne | Ph.D. |
| Weesner, Margaret | M.S. |

4 Ph.D. students
18 M.S. students
22 students

## RANGE RESOURCES

| | |
|---|---|
| Alcocer-Ruthling, Jose | Ph.D. |
| Allen, Linda | Ph.D. |
| Boo, Roberto Miguel | Ph.D. |
| Dobson, Janice | Ph.D. |
| Dumas, Brett | M.S. |
| Gibson, Chad | Ph.D. |
| Jirik, Steven | M.S. |
| Josaitis, Robert | M.S. |
| Kenney, Daniel | M.S. |
| Miller, Valerie | M.S. |
| Rimbey, Neil | Ph.D. |
| Roscoe, Kirsten | M.S. |

5 Ph.D. students
7 M.S. students
12 students

## FOREST RESOURCES

| | |
|---|---|
| Advincula, Benny | Ph.D. |
| Amell, Larry | M.S. |
| Balice, Randy | Ph.D. |
| Barkley, Robert | M.S. |
| Bertagnole, Catherine | Ph.D. |
| Cathcart, James | M.S. |
| Chakanga, Moses | M.S. |
| Covell, Bonnie | M.S. |
| Cronk, Jayne | M.S. |
| Daa, Mohamed | M.S. |
| Dammann, Carl | M.S. |
| Diallo, Moussa | M.S. |
| Du, Wei | Ph.D. |
| Dumroese, Ronald | Ph.D. |
| Edson, John | M.S. |
| Evers, Louisa | M.S. |
| Fahsi, Ahmed | M.S. |
| Ferguson, Dennis | Ph.D. |
| Foss, Craig | M.S. |
| Goudie, James | Ph.D. |
| Grigsby, William | M.S. |
| Hammoudi, Abdelaziz | M.S. |
| Head, John Dean | M.S. |
| Hensold, Ted | M.S. |
| Johnson, Jan | M.S. |
| Katzer, Scott | M.S. |
| Kazemi, Fathollah | Ph.D. |
| Kessler, Charles | Ph.D. |
| Khatouri, Mohamed | Ph.D. |
| Kingsbury, Ralph | M.S. |
| Koehn, Anita | Ph.D. |
| Lim, Youngtaik | Ph.D. |
| Lorain, Christine | M.S. |
| Mastrogiuseppe, Ronald | Ph.D. |
| McGarry, Timothy | M.S. |
| McGown, Mary G. | Ph.D. |
| Meinke, Paul | M.S. |
| Messat, Said | Ph.D. |
| Mital, James | Ph.D. |
| Mitchell, Margaret | M.S. |
| Montville, Mark | M.S. |
| Nguyen, Can | Ph.D. |
| Nurkin, Baharuddin | Ph.D. |
| Oswald, Brian | Ph.D. |
| Page-Dumroese, Deborah | Ph.D. |
| Parent, Dennis | M.S. |
| Saphra, Irene | M.S. |
| Saveland, James | Ph.D. |
| Sawadogo, Kourita | M.S. |
| Scialfa, Michael | M.S. |
| Shafii, Bahman | Ph.D. |
| Shields, Matthew | M.S. |
| Simpson, Michael | M.S. |
| Stiff, Carol | Ph.D. |
| Subhan, Fazli-i | M.S. |
| Tayyib, Zarnigar | M.S. |
| Tittemore, Rodney | M.S. |
| Tonn, Jonalea | Ph.D. |
| Wang, Xheng-Guang | M.S. |
| Wannawong, Supachart | M.S. |
| Weiner, Eric | M.S. |
| Wellner, Kint | M.S. |
| Whiteman, Michael | Ph.D. |
| Winterberger, Kenneth | M.S. |
| Zhang, Hemin | M.S. |
| Zhang, Jian-Wei | M.S. |
| Zhang, Lian Jun | Ph.D. |
| Zida, Bertrand | M.S. |

26 Ph.D. students
42 M.S. students
68 students

## Hitting Our Heads On The Ceiling

*We know the dog chasing*
*his tail has a nose;*
*Even though we, programmed, rewind*
*the tapes not bothering about input.*

*Matter does it to us?*
*Remains tripping us like a blind*
*mute trying to see, to scream*
*danger which is known.*

*Like a crowd*
*crouched under a low*
*ceiling, we constantly*
*try to stand.*

— Cynthia Sills

# Index to Advertisers

We are especially grateful to the following friends for their help and encouragement on the 1988 Idaho Forester.

Leo Ames — UI Publications

Cindy Johnson — UI Printing & Design Services

George Savage — FWR Publications

Michal Pierce — FWR Publications

Carol Staker — FWR Publications

Carol Bailly — FWR Publications

Bill Woolston — Department of Communications

Evan Vonberg — Mountain States Press

Jim Rennie — UI Outdoor Program

The Secretarial Staff of FWR

# Our Graduates Are Highly Trained in Renewable Natural Resources

## Fishery Resources

The fisheries biologist is knowledgable about aquatic environments and aquatic organisms and can apply this knowledge to managing ponds, lakes, reservoirs and streams. Areas of expertise include aquatic pollution, fisheries management, population dynamics, limnology, and the behavior, culture, diseases, ecology and physiology of fish.

## Forest Products

The forest products graduate is well-grounded in all phases of forest business operations, including timber harvesting, logging-engineering, transport of goods to market, processing, computerized sawmill operations, manufacturing, marketing, and research and development for a variety of forest-related industries.

## Forest Resources

The modern forester is well versed in economic theory, skilled in computer technology and proficient in public communication, besides being knowledgable in forest biology, natural history, forest protection (entomology, pathology, fire), reforestation, forest ecology, and silviculture.

## Range Resources

The range conservation graduate has a strong base in ecology and can assess land capabilities, develop land-use plans, rehabilitate mine spoils, perform soil surveys, administer grazing leases, appraise land values, study nutritive requirements of animals, and participate in research on use of natural resources.

## Wildland Recreation Management

The wildland recreation graduate is skilled in parks and recreation resources management, natural sciences, geography, land economics, conservation of natural resources, human behavior, public administration, communication, and tourism. Specialization is available in: resource communication, outdoor leadership, resource-based tourism, and wilderness management.

## Wildlife Resources

The modern wildlife graduate is interested in all species of wild animals and their roles as components of natural systems, and can gather data, conduct censuses, assess productivity, protect and improve habitat, study food habits, establish limits and seasons, control animal damage, protect endangered species, and enforce laws.

*If you know of job openings, or plan to hire someone in these fields, please contact Carol Spain, College Placement Office, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho 83843, phone (208)885-6441.*

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Back cover photo — Ron Mahoney

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