



University of Idaho graduate student, Dan Gager, checks in with the U.S. Forest Service from the Pasayten Wilderness in northern Washington State. Dan is a trip leader in the wilderness experience Pilot Program and Study for resident youth at risk from three Federal Job Corps Centers the U.S. Forest Service operates under contract to the U.S. Department of Labor.

Wilderness research encompasses many topics with studies aimed at supporting management of wilderness areas, enhancing benefits and reducing conflicts, assessing wilderness resources and opportunities, advancing basic science and monitoring wilderness environments (Hendee & Ewert, 1993). Results from such research directly support stewardship of the 95 million acre National Wilderness

Universities Must Play a Larger Role in Wilderness Research

by John C. Hendee

Preservation System and contribute to the knowledge base underlying all natural resource science and management. When universities are involved in wilderness research, it stimulates related teaching and educational programs preparing students for conservation of wilderness and a broader view of natural resources conservation in the future.

The uses of wilderness for scientific and education purposes were part of the original vision for the National Wilderness Preservation System (Noss, 1991). But we have not taken full advantage of the tremendous opportunities to learn more from wilderness about the natural world and how it compares to developed areas. The Wilderness System contains the most natural remaining areas of our nation; from these baseline areas we can explore such things as the environmental effects of global climate change, how we are affecting natural processes in roaded areas and how natural ecosystems really function (Leopold, 1941). We need expanded programs of wilderness research to harvest the scientific values of our Wilderness System, to support its management and as a source of new knowledge for educational programs of all kinds—thus taking advantages of wilderness as one of the world's greatest teachers and classrooms. Universities can and must play a larger role in wilderness teaching and research to achieve these goals.

One of six recommendations in the report of the National Wilderness Research Needs Committee of the Society of American Foresters—Wilderness Working Group (1994) is that "more university programs in wilderness research and teaching are needed." This recommendation comes from a committee with representatives from all four wilderness managing agencies, five national environmental organizations and four forestry deans. The committee, in arriving at their recommendations, considered a survey of all wilderness research studies on-going in 1991 and an assessment of wilderness research priorities by panels of scientists in the five areas of:

- (1) wilderness environmental monitoring, assessment and atmospheric effects
- (2) wilderness fire ecology and management
- (3) wilderness wildlife and fish populations, habitats and uses
- (4) wilderness ecology and user impacts
- (5) wilderness visitor management, benefits and non-use values.

This article goes beyond the committee report with additional discussion about the important benefits to be gained by strengthening university programs in wilderness research (and thus wilderness teaching), and proposes three ways such programs could be strengthened.

Current Wilderness Research by Universities

The survey of wilderness studies active in 1991 by the National Wilderness Research Needs Committee found only 28 studies (5 percent) that involved universities among the 551 active studies they identified (Carr & Hendee, 1994). The university studies in wilderness may be under represented in the survey because even though all natural resource colleges and departments in the land-grant university system (60), and all fish and wildlife academic programs nationwide (48) were contacted, this is an incomplete list of universities with potential wilderness interests.

However, the land management agencies are generally aware of university studies in wilderness under their jurisdiction and were asked to identify them. In fact, the agencies were financially supporting many of the university studies that were identical. Thus, casual observation of these data, rough as they may be, suggests that universities are not participating in wilderness research at a level reflecting what they could contribute ("minimal and adequate" is how the National Wilderness Research Needs Committee characterized current extent of university wilderness research).

Funds for wilderness research by universities are very limited. There are only three university programs nationwide with dedicated base funding focused on wilderness, including centers at the University of Idaho, University of Montana and University of Minnesota. Other universities conduct wilderness research as funding and opportunities are available, and some of their faculty are well known for wilderness research and writing. Most of these faculty participate in wilderness research through research con-



University of Idaho President Elisabeth A. Zinser and University of Idaho Wilderness Research Center Director John C. Hendee lead "Blue Eyes" across Big Creek at the university's Taylor Ranch Field Station in the Frank Church River of No Return Wilderness.

tracts and cooperative agreements with wilderness management agencies. The newly formed Aldo Leopold Wilderness Research Institute of the USDA Forest Service in Missoula, Montana, operates a national program of wilderness research covering all the wilderness agencies, with some cooperative studies by universities. A few studies have been supported by federal research grants such as the McIntire-Stennis program of the U.S. Department of Agriculture that provides funding to State

Land-Grant Universities for forest management-related research.

Since there is no national program to provide funding for university wilderness research, such work will continue to depend on external grants and contracts, supplemented by efforts based on faculty interests and limited available funding at individual universities. Clearly, this current situation is inadequate since universities accounted for only five percent of all active wilderness studies in 1991.

Wilderness Teaching in Universities

In most universities teaching is closely tied to research as faculty try to combine their teaching and research interests and acquire research funding for summer

the courses were focused on the science-based topics of wilderness protection and management or wilderness as natural ecosystems. Wilderness appreciation and use and wilderness allocation and classification accounted for 43.7 per-

John Hender



University of Idaho Wildlife Professor Dr. James Peek and his wife Pat collect big game forage data on the slopes above the University of Idaho Taylor Ranch Wilderness Field Station in the Frank Church River of No Return Wilderness.

science including (1) economy, (2) flexibility and diversity, (3) continuity, (4) quality and credibility and (5) educational benefits. These attributes are outlined below, followed by three proposals on how to increase wilderness research by universities. A key premise is that increased wilderness teaching will follow increased wilderness research in universities.

1. Economy

For many kinds of wilderness studies, universities provide very economical rates for the planning, data collection, analysis, interpretation of results and reporting of findings compared to costs that might be incurred by agencies or consultants carrying out the same studies. There are many reasons for such savings including the low wages paid to graduate students working under the supervision of faculty whose academic salaries are generally paid by the university; universities have access to the latest technology and equipment, often available for use at minimal cost by pro rata sharing of expenses with other funded studies; modest overhead fees compared to what would be required for agency provision of space, equipment, access to computers, software, library, vehicle fleets, payroll, purchasing, travel reimbursement and other accounting functions and generally lower salary scales for faculty work. Certainly it is less expensive in the long run for a federal agency to use universities to carry out a particular program of studies than it would be to hire permanent employees to complete the research and continue on the payroll through careers and retirement pensions. Of course, a balance between agency and university research makes the most sense. Agencies know that scientific information they need to manage and protect wilderness while universi-

salaries and graduate student support.

Data on the extent of wilderness-related courses at universities are limited. One survey in the early 1980s located 417 colleges and universities that offered wilderness-related courses (Hendee & Roggenbuck, 1985). This study received questionnaire responses from 242 instructors (52 percent) who collectively reported teaching 542 courses, including nearly 8,000 students in each of the 1981-82 and 1982-83 school years. This is a significant amount of wilderness teaching, but only 28.5 percent of

cent of the course topics with history and environmental education/ethics accounting for most of the rest.

An attempt to replicate this study in 1990 was only partially successful in repeating the original contacts, but suggested that wilderness-related courses may have declined (Krumpe, 1994).

Arguments for More Wilderness Research by Universities

There are many arguments for increasing wilderness research by universities based on attributes they could contribute to wilderness

ties are more focused on larger scientific issues and related education.

2. Flexibility and Diversity

By drawing upon university faculty, agencies have timely access to a great diversity of disciplinary expertise and dedicated scholars with important ideas for scientific pursuit—all without the expense of their employment by federal agencies. This provides flexibility and makes possible the economical pursuit of difficult research programs that require different expertise at various stages and can supplement agency research programs with key expertise at strategic times. Besides saving money, such flexibility can give wilderness research the power to pursue more complex scientific programs.

3. Continuity

It is very expensive to carry out long-term studies whether it is done by federal agencies or universities. But long-term research is successfully carried out by many university faculty in the process of educating successive waves of graduate students. Some of the classic long-term wilderness and wildlife studies have involved universities such as the Kaplans' studies of wilderness experience by young people, Allens' studies of wolves and moose at Isle Royale, Mech's studies of wolves, Hornocker's research on cougars and the Craigheads' studies of grizzly bears. The involvement of universities in long-term research may be especially economical for wilderness studies where annual data collection is seasonal and requires travel to remote locations under rigorous field conditions—an experience often relished by graduate students who are available during field seasons. And what better way to foster long-term research than the training of graduate students as young scientists to

continue the work.

4. Quality and Credibility

There are several outstanding wilderness scientists employed by the federal agencies who are doing excellent work that is published in important journals. However, few would argue that the agencies can compete with committed university programs for the best Ph.D. graduates, many of whom are seeking careers combining teaching and research. Such budding faculty members, as well as their colleagues, depend for advancement on their publication in the best refereed, scientific journals. Both cooperation and competition in wilderness research between federal agencies and universities, and placing a premium on refereed, scientific journal publications will upgrade the scientific quality and thus the credibility of wilderness research.

5. Educational Benefits

Increased wilderness research by universities will also stimulate wilderness-related teaching with associated educational benefits. Faculty members must find ways to combine their research and teaching activity; thus new courses are more likely in topics where there is opportunity for research grants. So, increased investment in wilderness research by universities, whether it is funded by outside grants and contracts or by universities themselves, is likely to be



Firewood cut by crosscut saw is hauled by pack horse at the University of Idaho Taylor Ranch Wilderness Field Station in the heart of the 2.3 million acre Frank Church River of No Return Wilderness.

accomplished by an increase in teaching pertinent to wilderness. Faculty with financial support for wilderness research can justify developing wilderness courses and guiding graduate students in wilderness studies.

How to Increase Wilderness Research by Universities

There are at least three feasible ways to increase wilderness research by universities: (1) increase research agreements, grants and contracts for university wilderness research by the federal agencies, (2) increase university funding for wilderness research in states with substantial wilderness acreage and (3) establish a new federal wilderness research grants program.

1. Increase cooperative and grant research by federal agencies

The federal wilderness managing agencies (Forest Service, Bureau of Land Management, Fish and Wildlife Service and National Park Service) all support wilderness research in universities to some

degree through cooperative agreements, contracts and grants. Thus, as agency funding for wilderness research increases, wilderness science in universities should benefit. As outlined above, with greater participation by universities, the economy, flexibility and diversity, continuity, quality and credibility of wilderness science will be enhanced, leading to increased educational benefits as well. This will help the agencies redeem their wilderness stewardship responsibilities.



Shawn Hull from the Curlew Federal Job Corps Center and University of Idaho student Joy Hendee share a natural high in the Pasayten Wilderness. Shawn is a participant and Joy is an assistant leader in the Wilderness Discovery Pilot Program and Study conducted by the U.I. Wilderness Research Center in cooperation with the U.S. Department of Labor, Job Corps and the U.S. Forest Service.

2. Increase university funding for wilderness research and teaching by states with substantial wilderness acreage.

Several western states contain substantial acreage in the National

Wilderness Preservation System and have additional roadless areas proposed as candidates for wilderness classification. These allocations and proposals reflect the

great public interest in wilderness and help justify increased state funding for university wilderness research and teaching. Modest investments in wilderness-related university programs, at least to the point of making wilderness research and teaching a dignified venture for faculty pursuit, would also have synergistic effects by encouraging faculty response to grant and contract opportunities with the federal agencies.

3. Develop a federal grants program for university wilderness research

A federal grants program to support university wilderness research would now be timely (Hendee, 1991; Hendee & Ewert, 1993). The proposed National Wilderness Management Act of 1992 included two provisions designed to strengthen university participation in wilderness research. This bill, with leadership by Congressman Bruce Vento of Minnesota, proposed adjusting the McIntire-Stennis (M-S) forest management research grants program for universities to affirm the eligibility of wilderness studies for financial support, and also proposed a new wilderness research grants program to be operated by the U.S. Department of Agriculture.

Response and testimony on the bill documented that wilderness studies are already eligible (although rarely made) under the M-S forest management research program, and there seemed little support then for the proposed new wilderness research grants program. At the time, the research interests in the bill were focused on provisions for the Aldo Leopold Wilderness Research Institute



Dan Gager, University of Idaho recreation graduate student, and Joy Hendee (standing left), University of Idaho senior in criminal justice, talk with Federal Job Corps enrollees participating in Wilderness Discovery, a seven-day wilderness experience Pilot Program and Study conducted cooperatively by the U.I. Wilderness Research Center, the U.S. Department of Labor and the U.S. Forest Service.



A private landing strip serves the University of Idaho Taylor Research Wilderness Field Station on Big Creek in the Frank Church River of No Return Wilderness. There are more than a dozen public air strips in that 2.3-million acre wilderness.

which was subsequently established. Now it is time to consider ideas for strengthening university wilderness research. Specifically, we need a national wilderness research grants program, with allocation to states guided by factors such as their wilderness acreage, numbers of wilderness areas and population just as the M-S program allocates forest management research funding to state land-grant universities according to the standing timber volumes and annual timber harvests in each state.

Summary and Conclusions

A national wilderness research needs study revealed that only five percent of the 551 active wilderness studies in 1991 were by universities. Without any national program of funding to support wilderness research by universities, wilderness

studies must depend primarily on cooperative agreements, contracts and grants from the federal wilderness management agencies. Yet, stronger participation in wilderness research by universities would enhance the economy, flexibility and diversity, continuity, quality and credibility of our nation's overall wilderness science effort. It would also strengthen stewardship of our nation's 95-million acre and growing wilderness system, contribute basic knowledge to all natural resource science and management and stimulate related educational programs.

Federal agencies need to invest more in wilderness research. We need to strengthen research to support stewardship of the 95-million acre Wilderness System, redeem the science and education mandate of the Wilderness Act and generate the requisite knowledge of natural systems to support ecosystem management on all federal lands. But to meet these goals universities must play a larger role in wilderness research.

In sum:


1. Federal agencies must increase their contracts, grants and cooperation in wilderness research with universities.
2. More universities in states with substantial wilderness acreage

must devote base funding to wilderness research and teaching.

3. A federal wilderness research grants program is needed, comparable to the McIntire-Stennis program that supports forest management-related research at the nation's state land-grant universities. This would also strengthen



The University of Montana's Wilderness Institute runs a Wilderness and Civilization Program with a combination of extended back country trips and two interdisciplinary academic semesters where students examine the scientific, historical, cultural, spiritual, philosophical, political and legislative backgrounds of wildland values and wilderness management and designation. A Wilderness Studies Minor degree is obtained upon completion.

teaching related to wilderness and natural systems, vital knowledge upon which ecosystem management on all lands is based. 

John C. Hendee is Director of the Wilderness Research Center, University of Idaho, Moscow, Idaho 83844-1144.