

I N T E R N A T I O N A L

JOURNAL OF WILDERNESS



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International Journal of Wilderness

The *International Journal of Wilderness* links wilderness professionals, scientists, educators, environmentalists, and interested citizens worldwide with a forum for reporting and discussing wilderness ideas and events; inspirational ideas; planning, management, and allocation strategies; education; and research and policy aspects of wilderness stewardship.

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THE SUSTAINABILITY OF U.S. WILDERNESS— *Ecologically, Socially, and Politically*

BY JOHN C. HENDEE, MANAGING EDITOR

THE NATIONAL WILDERNESS PRESERVATION System in the United States is a crowning achievement of our culture and also an important model for other countries seeking to preserve the best of their remaining wildlands. But even in the United States we must be vigilant over the ecological, social, and political sustainability of our wilderness.

Ecologically, the sustainability challenge is the preservation, protection, and restoration of natural processes. Letting fire, insects, disease, wind, and other natural processes run their course, without undue interference, has proven to be a challenge for wilderness stewards. In many cases true naturalness has had to be sacrificed for practical considerations relating to human safety, and to protect adjacent resources outside the wilderness. Letting nature roll the dice in determining ecological consequences—that is managing wilderness as guardians not gardeners—is not easy.

Socially, wilderness is characterized in part by increasing use (see article by David Cole in this issue). Most of this use is by small, private groups of upper middle-class citizens on foot; but, there is also a healthy outfitting and guiding industry taking boaters, floaters, and backpackers to wilderness in growing numbers. Some wilderness visitors use vacation time to maintain trails or restore wilderness sites, while others go on trips sponsored by educational, religious, conservation, or recreation for-profit organizations. A current study found 700 wilderness experience programs operating nationwide for purposes of personal growth, therapy, education, and leadership development (Friese 1996), with a companion study of wilderness managers indicating overwhelming agreement that use by such programs is increasing (Gager 1996).

The economic benefits to local economies having adjacent wilderness and the struggle to incorporate social input to wilderness planning have been described in *IJW* (Tom Powers, *IJW* Vol. 2, No. 1; McCoy et al., *IJW* Vol. 1, No. 2; Merigliano and Krumpel, *IJW* Vol. 2, No. 2). The legal requirements to maintain naturalness and solitude in wilderness and allow only primitive forms of recreation are at the heart of the social sustainability of wilderness.

But managers must also address unanticipated (social) effects of limiting use. People that are not used to dealing with bureaucracies, who are unable to pay for outfitted services, permits, or transportation, may be essentially denied a wilderness opportunity. While it is true that there is a limit

to the ability of a wilderness to sustain human impacts, it is also true that the greatest value of wilderness may lie in its ability to awaken the human spirit. There may be no stronger protection for wilderness than from people who have rekindled a spiritual flame from their wilderness experience.

Limits are needed on wilderness use to protect its values of solitude, wilderness, and untrammelled nature. With increasing population and wilderness use, limitations are inevitable, but wilderness stewards must also ensure that use limitations do not exclude any particular group of people.

Politically, sustainability of wilderness demands response to social change in addition to skill and judgment in dealing with ecological and social issues. For example, the shift of public responsiveness from national to local influences is putting more decision power in local hands. We must respond. Even more serious in the long run may be the upper middle-class homogeneity of wilderness users and managers that contrasts sharply with our increasingly multicultural, urban society. At the 1994 National Wilderness Conference in Santa Fe, a virtually all-white and predominately male audience faced a few speakers who warned us of the dangers of white, upper middle-class homogeneity in wilderness management and use in a democratic country destined to soon have an urban, multicultural majority. The Wilderness and Natural Areas in the East conference at Gatlinburg in May 1996 likewise had few minorities. However, there was one Job Corps center director from Atlanta who extolled the values of the experimental Wilderness Discovery backpacking program for young black women at his center.

The political sustainability of wilderness will depend on making wilderness relevant to as broad a spectrum of people as possible. The current initiative to have a national wilderness leadership conference devoted to an urban, multicultural theme deserves support by everyone concerned about the political sustainability of wilderness.*

The sustainability of wilderness is more than an ecological issue; it is about social and political considerations for wilderness too. They may be the most difficult elements of wilderness stewardship, but they also need our attention. **IJW**



Article author and *IJW* managing editor John Hendee.

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Gager, Dan. 1996. Federal land managers policies and managers perceptions on the use of wilderness for personal growth. Unpublished masters thesis, University of Idaho, Moscow.

*For information about this initiative, contact Margaret Petersen, Chair, Society of American Foresters Wilderness Working Group. Telephone: (503) 326-3644.

SOUL OF THE WILDERNESS

A Wilderness Ethic for the Age of Cyberspace

BY RODERICK NASH



Article author Roderick Nash (left) stands with Magqubu Ntombela (center) and Ian Player (right).

JUST A FEW YEARS AGO an understandable measurement of the wildness of a place was its distance from the nearest telephone. But now, thanks to satellite-based communications technology, the phone has entered the forest. Moreover, battery-powered minicomputers can link a wilderness user to the World Wide Web (WWW). You literally can't get away from it all anymore. What are the implications of two-way communication any place on the planet for the soul of wilderness?

From one perspective we can ask, what's the big deal about a little cellular phone

tucked into the side pocket of a backpack? What's the problem with saying goodnight to the kids before you climb into your tent or checking on the Dow Jones average the next morning? You still can't get a pizza delivered in the wilderness. The person on the other end might listen to you as you become a pizza for a bear, but they can't do much about it except to call the helicopter.

The starting point for determining if there is a problem here is to realize that while instant two-way communication with the outside does not damage the wilderness ecosystem, it does impact heavily on the wilderness experience. A dilution of wildness occurs. Wilderness is not really a physical place but a set of qualities associated by a visitor with a place. It has to do with perception. Feelings matter.

So, for example, a pile of garbage alongside a trail or large numbers of hikers using the trail can reduce the intensity of wilderness and perhaps for some destroy it completely. Land managers have long recognized this fact. But even something as seemingly innocuous as a trail sign can diminish wildness. I recall seeing one that stated "Lost Lake: 2.3 miles," and thinking, well, it's not lost anymore, and then understanding that maybe it is important to have a few lakes that are not fully known and where a person can still get lost—and, it may be, find themselves!

So delicate is the wilderness experience that it is vulnerable to seemingly insignificant disturbance. Just seeing a jet contrail or hearing the sound of a distant freeway can tear the delicate wilderness fabric apart for some visitors. I recall camping with Ian Player and Magqubu Ntombela in South

Africa's Umfolozi Game Reserve. By some criteria it was a very wild place. We had walked past wild rhinos and there were hyenas crying, but I could also hear vehicles downshifting on a road grade three or four miles away. Those, I remarked, were impalas of the Chevrolet kind. They were a reminder of the outside civilized world, and they bothered me.

For just this reason, The Wilderness Act of 1964 made specific reference to keeping designated lands free of the sights and sounds of civilization. Roads, mines, clearcuts, and cottages were the traditional enemies. But what if the sights and sounds of civilization enter wilderness on your own pack? What if they descend a cyberspace stairway from the stars?

The starting point for addressing this issue is to recognize that what makes wilderness valuable is its difference from civilization. To the extent that we close the gap, we dilute and ultimately destroy what is unique and valuable about a wilderness experience. Sure the "outdoors" will remain, and it may be that our "wired" grandchildren will not miss the old, wild isolation at all. But before we let the wildness go out of wilderness, we had better think carefully about the role that uncontrolled, unknown, and mysterious places have played in our physical and mental evolution. As Wallace Stegner observed, something precious may go out of us as a species if we ever lose the opportunity for contact with real wilderness. Knowing too much about a place alters its essence. Bringing too much of civilization into wilderness changes its character. Are we facing the death of discovery, of exploration? How should we regard the new communication technologies?

I suggest starting by thinking about restraint and its relation to wilderness preservation. The history of U.S. protection of wild country began in the 1920s and 1930s with the determination by the U.S. Forest Service to keep roads out of designated environments. These so-called "roadless areas" later became the core of the 1964 National Wilderness Preservation System. The point is that roads could have been built, but society opted to restrain itself in the interest of protecting the wilderness experience. In the 1960s it became increasingly apparent to managers that restraint would have to be exercised also with regard to wilderness visitors. The concept of "carrying capacity" gained importance along with the realization that wilderness could be loved to death. The new management tool was the visitor quota (and the associated wilderness permit), which were first applied to Mt. Whitney in California and the Grand Canyon, both in 1972. Filling out forms and going through waiting lists or lotteries, we learned another dimension of restraint with regard to wilderness. Minimum-impact camping

procedures—part of a rising wilderness ethic—also indicated willingness to accept restraint in the interest of respect for the wilderness experience.

The knowledge and communications revolution as it concerned wilderness began, in one sense, with the making of maps. Classic wilderness was terra incognita: the blank space on the map. For most of the 20th century there were wild holes in the U.S. Geological Survey's effort to map the entire nation on its famous "topo" maps. I recall planning one trip that was literally off the charts. It was exciting to figure out the land for yourself; self-discovery is always the sweetest. I sometimes told my students to leave the maps at home and ignore the guidebooks and just go out and see what was around the bend. The compensation for the occasional navigational error was a heightened sense of wildness, and after all, aren't risk, uncertainty, and self-reliance at the heart of the wilderness experience?

Around 1980 the last of the topographic maps were released. If you had a big enough floor, you could lay out the entire continent edge to edge. It was in one sense a great human achievement, but something of the old wild continent and of pioneering died with the filling in of those last blanks. And now we have satellite imagery that, as any reader of Tom Clancy novels knows, can show a pack of cigarettes from outer space. You can obtain photographs of every inch of the planet,

updated every few hours. Alaskan wilderness defender Roger Kaye has noted that computers, combined with remote sensing, allow prospective wilderness visitors to order up and preview destinations, routes, and campsites. On the ground, travelers can use a pocket-sized Geographical Positioning System to determine their exact latitude and longitude, pinpointing a location within a few feet.

Still more invasive of the wilderness experience, it seems to me, is two-way communication technology. Cellular phones work perfectly in many wilderness areas today and are on the verge of total planetary coverage. Computer technology adds a new dimension. Using the WWW, adventure travel companies are actively marketing cyberspace "chats" between the battery-powered laptop computers of expeditions in the field and living room explorers of virtual reality. You don't have to go the wilderness anymore to go to the wilderness. But does what you find have anything to do with the wild?

Wilderness requires restraint: The upshot of all this is that the potential of communications technology to impact adversely on wilderness once again requires the exercise of restraint. Motor vehicles and airplanes have been outlawed, and it may be time to extend the protective net. Possibly language should be added to The Wilderness Act, banning two-way communi-

cation technology along with mechanized transport. Alternatively we could hope for voluntary cooperation—a new form of wilderness ethic. Most people understand that a cellular phone is inappropriate in a cathedral; how about John Muir's cathedral of the wilderness? Outdoor educators, land managers, and wilderness guides can lead the way here.

At Grand Canyon Dorries, a wilderness-oriented outfitting company specializing in river trips, we tell our guests that it's different out here. Leave the cellular phone and the laptop at home. Conversely, if you want things to be just as they are at home, stay at home. For at least two weeks respect the wilderness and let the river be your information highway. Without this kind of self-restraint we risk preserving wilderness that is no longer wild. **IJW**

RODERICK NASH is Professor Emeritus of history and environmental studies at the University of California—Santa Barbara. His book *Wilderness and the American Mind* (third revised edition, 1982) is regarded as one of the foundations of the modern understanding and preservation of wilderness. Dr. Nash has also written *The Rights of Nature: A History of Environmental Ethics* (1989), *American Environmentalism* (1989), and *American Environmentalism* (1990). He is a white-water river guide, with more than 50 descents of the Colorado River through the Grand Canyon, and a founding partner of Off the Beaten Track, a film company featuring the wilderness experience. He can be contacted at 4731 Calle Reina, Santa Barbara, CA 93110, and P.O. Box 277, Crested Butte, CO 81224, USA.

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Issue	Need Submissions by	Country
Volume Three, Issue One March 1997	(10/96)	Asia
Volume Three, Issue Two June 1997	(1/97)	New Zealand
Volume Three, Issue Three September 1997	(4/97)	Antarctica
Volume Three, Issue Four December 1997	(7/97)	South America

MANAGING WILDERNESS IN PERPETUITY AND IN DEMOCRACY

BY ROGER KENNEDY

[*Editor's Note:* During his tenure as head of the U.S. National Park Service, Director Kennedy has rekindled interest and renewed the agency's focus on wilderness. *IJW* is pleased to share some of Director Kennedy's ideas on this subject. —John C. Hendee]



Article author and Director of the U.S. National Park Service Roger Kennedy. (Photo by Diana Walker.)

WILDERNESS WRENCHES humans out of their habits and complacencies. The wilderness experience is not one of finding a destination, but, instead, of being restored for a more effective return. Back from wilderness, Moses brought obligations and rectifications of bad habits; Jesus brought back from wilderness a stern repudiation of tribalism and an assertion of unity among all humankind. From his wilderness voyage, Darwin brought a sense of the unity of experience among all species.

ience among all species.

We may go to wilderness in a state of inflation, but we return in scale; very small, but very responsible. We are, of course, responsible for ourselves, but, because we have memory and anticipation, we are also responsible for the consequences of our actions upon other species.

The Best of the Very Best Lands

After decades of priding itself on managing the best of the very best of America's public lands legacy, the National Park Service (NPS) was wrenched from its own sort of complacency by passage of The Wilderness Act in 1964. We had been managing the best of the very best, as we thought and still think, since 1864, or 1872, or 1916, depending on how you account for such things. And then Congress announced that there was in fact a very best within the very best to be managed somehow differently. The NPS by no means leaped on the wilderness bandwagon, but from the first wilderness area designation on national park lands in 1970 to passage of the California Desert Protection Act in 1994, designated wilderness grew to become more than half of our NPS land base. NPS management responsibility now extends to 40% of the entire National Wilderness Preservation System (NWPS). We are not, nor can we afford to be, complacent about wilderness management.

In 1964 when The Wilderness Act became law, the NPS was still preoccupied with concluding Mission 66 and its ambitious program of rebuilding park infrastructures, after the serious budgetary neglect of park facilities during World War II collided with the postwar surge in tourism. Wilderness stewardship was difficult then; it is likely to always be so. Today we face forces in the public arena that assert parks are not worth the cost of maintaining them. These forces say the places that we chose as our best places, these landscapes and shrines, places of wonder and reverence, these common grounds of the common good are a needless expense. They say we cannot afford these places where we invite each other to consider what it is about the United States in which we take the greatest pride. We cannot afford, they say, places where we consider what we are at our best.

And now as we move to become better stewards of our wilderness areas, the NPS finds itself struggling to remind U.S. citizens and their representatives in Congress that these places of wonder are also places of national pride. Land is a source of pride and passion in our culture. Yellowstone, Yosemite, and the Grand Canyon were established with the language of patriotism. We live, so these acts of Congress come true, in a land where such places exist, and we are a people capable of reserving such places from exploitation.

Wilderness: Balancing Technology and Exploitation

Concern for Yosemite and Yellowstone in 1864 and 1872 was concern for wilderness, although it was not called that then. Protection for these areas reflected the U.S. citizens' concern for the best of their national public domain lands. We still care very deeply about this. Our concern is a reality, despite our apparent inclination to believe technology has a life of its own and develops without regard for our opinions. Few people speak against growth and expansion, yet a potent tide of environmental conservation has developed in this century to slow the headlong rush of blind progress. This concern reflects not opposition to progress but rather a deep-seated uneasiness about how narrowly progress has been construed. We care about some other things than making a living. We have some values not governed by market forces. And this tension between U.S. citizens' deep concern for their environment and the fatalistic rush to the myth of progress constitutes the dynamic in which wilderness stewardship takes place.

After the Civil War, railroads expanded western settlement and made ravenous eastern urban markets accessible to western natural and agricultural products. Federal public land laws of this period encouraged the scandalous exploitation and abuse of the public domain. Approximately 50% of U.S. public forest lands passed into private ownership within a mere 15-year period, in a tremendous assault on the public good from 1863 to 1878. This was truly a disgraceful era of land theft and resource exploitation, reflecting an extension of the political spoils system to our public domain lands.

We can look back and see that the National Park System and now the NWPS are, in part, reactions to exploitation and destruction of the public domain. Public uneasiness and disgust at the exploitation of natural resources was an important factor in President Theodore Roosevelt's progressive political agenda that led to the establishment of national forests, wildlife refuges, national monuments, and other protected areas. However, it was the travesty of invading Yosemite National Park in 1913 for a commercial hydroelectric power project that contributed to the establishment, by Congress, of the NPS in 1916. The NPS grew under the aggressive leadership of Stephen Mather, and later, his understudy Horace Albright, at a time when recreation and tourism development were believed to be entirely consistent with the NPS Organic Act and unrecognized as impacts on wilderness. It was only with the legislation in the 1930s that established Grand Teton and Everglades National Park, and in the 1940s, Kings Canyon National Park, that wilderness protection expressly motivated national park establishment.

The tension between U.S. citizens' concern for its remnant public domain lands and acquiescence to the myth of progress changed even more significantly in the 1950s and 1960s. In the mid-1950s, national park lands were threatened by dam construction, just as with Hetch Hetchy in Yosemite, but this time conservationists waged their war nationally. The plan to build the

Echo Park Dam within Dinosaur National Monument resulted in the first truly national campaign of conservation groups working in close concert. In a coming of age for the U.S. conservation movement, the dam proposal was defeated, despite the powerful commercial, legislative, and bureaucratic forces allied in favor of building it. Leading that conservation battle were The Wilderness Society and the Sierra Club. Rather than disband their coalition and return to fighting isolated conservation brush fires, the groups opted in 1955 to redirect it to press for federal legislation for wilderness protection. As Roderick Nash has written, "the Echo Park victory gave promise that statutory wilderness preservation might be more than a dream." Today there are more than 100 million acres of designated wilderness in the NWPS. This system lies at the heart of that deep and abiding concern of the U.S. public to take care of those public lands to whom progress will show no mercy.

The NPS is in the heritage-keeping business. The heritage we keep embodies the entire gamut of human interactions with Earth, with so-called nature and culture, from wilderness at one end of the spectrum to intense urbanism at the other. From Alaska's Gates of the Arctic that Bob Marshall so loved, to Philadelphia's Independence Hall that symbolizes the heart of our great experiment in national self-government. The NPS is unique as a national entity for its mission to preserve the real places that exemplify the whole of that treasured spectrum in perpetuity. We mean to do our best with our wilderness heritage too. We know and share with all other wilderness stewards the meaning and challenge of a mission "in perpetuity." We are set for wilderness stewardship. We are fully engaged with the interagency Arthur H. Carhart National Wilderness Leadership Training Center and are represented on its staff. Our wilderness steering committee is involved in making wilderness management part of everyday NPS business. This means addressing wilderness management as a training issue, funding issue, person-



The heart of our great experiment in national self-government. (Photo by Richard Frear, U.S. National Park Service.)

Land stewardship is not independent from social and political realities but entwined with our history, culture, politics, and faith.

nel management issue, social issue, and, therefore perhaps most importantly, an education issue. We are looking for the best way to engage with the interagency Aldo Leopold Wilderness Research Institute. We know the need for wild areas and the recognition of that need most likely will grow, not diminish.

We recognize that the story of wilderness is the story of the United States, a story that serves as our link to the commonalities of our many-storied natural and cultural past. It is also a story that will continue and evolve, so we must not be complacent about the challenges we face. Democratic government is by its very nature always an experiment "to be continued."



Toroweap Overlook in Grand Canyon National Park—established with the language of patriotism. (Photo courtesy U.S. National Park Service.)

Wilderness Facing Change

As the United States' democratic experiment changes and evolves, National Park Wilderness Stewardship will face these changes:

1. Wilderness issues are shifting from primarily allocation (how many acres and where) to stewardship (seeing the wilderness condition perpetuate itself). We will continue to press for park wilderness designations, and we will continue to manage all qualified lands as wilderness until such time as Congress acts on designation. We will also impress our considerable land stewardship experience into the service of wilderness management. Land stewardship is not independent from social and political realities but entwined with our history, culture, economy, politics, and faith. Knowing this, we will reach out for new partners to help educate U.S. citizens about both their legacy and the continuing need to steward the land.

2. Dramatic demographic changes in the West are and will influence wilderness. The proportion of total U.S.

population living in the West has tripled since 1950. Were the 20 counties in and adjacent to the Greater Yellowstone Ecosystem a state, it would be the nation's fastest growing state. We will approach the stewardship of parklands, wilderness, and otherwise in ever more collegial fashion. We want to lend rather than to insist on our expertise. Rather than play our cards close to our chests, we will try to give away all that we know. And we recognize that many new residents are now drawn to the West more because of its wildlands character than for its other, more traditional economic possibilities.

3. The national population is aging, becoming more ethnically diverse, and growing in numbers. We will broadcast the benefits of wilderness that accrue to people whether they visit wilderness or not. We will seek out, learn, and carefully enfranchise the wildlands connections and heritage of ethnic groups and hope to make them wilderness partners and stakeholders. We will continuously examine our own cultural assumptions. We will aggressively impress upon wilderness users the "Leave No Trace" ethic (see article by Ralph Swain in this issue) and other types of zero impact awareness. We will become apostles for sensitive, sustainable environmental stewardship to all who share park boundaries, live upwind and upstream, or share the heritage vicariously through various media. We can no longer merely wait for people to come to their parks before we press our case.

4. Public involvement in public land management has increased greatly. When powerful opponents of wilderness at the 11th hour injected the review process into The Wilderness Act, they hoped to stymie the growth of the Wilderness System. Quite the opposite happened. They motivated citizens to learn how to influence federal decisionmaking and soon put an end to the old closed-committee mode of the Congress. The NPS appreciates the voices of citizens as individuals and members of nonprofit organizations as wholesome expressions of the com-

mon good. Again, we will both share our expertise with and work to educate public involvement for wilderness allocation and management issues. As proponents of biodiversity, we have no argument with a rich mix at the grassroots of politics.

5. The role of science is changing in the United States, and this will affect wilderness stewardship. Since World War II, scientists here began a half-century expansion of their role in policy-making. Conservation biology and the new forestry express this expansionism today, and limits-of-acceptable-change (LAC) management injects social science concepts into resource policy. Though increasing numbers of U.S. citizens now reject science and faith in technology, and Congress is clearly impatient, we will continue to make use of the best available science to inform our wilderness management decisions. And we will support responsible science in park wilderness.

These factors certainly will influence NPS stewardship of wilderness as well as its overall heritage-keeping mission. Indeed, the meaning and value of that wilderness stewardship may well be challenged in the future just as we so recently witnessed challenges to the national park idea itself. And to the extent that we let wilderness remain the exclusive concern of a small cadre of professionals, aficionados, and today's wilderness user, we invite such challenge. The same democracy that raised the wilderness system can also raze it! It is incumbent on the NPS then, as the steward of 40% of the Wilderness System, to reach out and make wilderness relevant to citizens in South Tucson, Miami's Little Havana, St. Maries in Idaho, and East Harlem. Any stewardship that asserts itself in perpetuity within the democratic framework, as The Wilderness Act clearly mandates, must ask and keep asking itself, "Who benefits? Who loses? Who has the power?" and perhaps most of all, "Who cares?"

In the NPS, I assure you, we pose that question as "Who else cares?" For we do care about wilderness. Had we not cared, and deeply, about wilderness,

we could not now be charged with managing so much wilderness land.

Wilderness wrenches us out of complacency about constituents and partners. We are and we will reach out and forge partnerships with wilderness-related industry, wilderness educators, and environmental nonprofit and nongovernmental organizations. We have many potential allies, but we need better ways and many other places besides our parks to reach them. We must bring new recruits to the cause, beginning with many of our fellow and sister citizens who have, in their way, been part of our alliance all along, but who have not heard much from us, to invite them to join us. Why should we do this? Who cares? Who are our caring allies? And who should be our caring allies? The reality is that all around us are citizens who should be with us in this great venture.

We humans believe ourselves to be important but not all-important. Even the most secular of conservationists would admit, I think, that they often feel humbled in the presence of wilderness. This feeling goes beyond awe to reverence. Humans, in the religious tradition, are not the only significant species on Earth. Our orchards, farms, and woodlots are not the only places worthy of respect. All of the more-than-human world is worthy of respect. The Wilderness Act is the legislative expression of that respectful idea, that outside our cultural constructs there are forms of life deserving our due regard. This is the heart of ecosystem management.

What better platform than wilderness, then, do we have for both the practice and the preaching of ecosystem management? And in several instances now, designated wilderness in national parks lies at the innermost protected core of Biosphere Reserves and World Heritage Sites. What better platform than such well situated wilderness could we ourselves have devised for the practice and the preaching of the most far-reaching and all encompassing passages of our holistic heritage-keeping gospel?

What does it mean that the U.S. public has considered it important to embed wilderness in national parks, and

... this tension between U.S. citizens' deep concern for their environment and the fatalistic rush to the myth of progress constitutes the dynamic in which wilderness stewardship takes place.

national parks in biosphere reserves, and biosphere reserves in World Heritage Sites? And now to embed all these expressions of our heritage within designated ecosystems, the better to realize a maximum quality of life, and not just physical life, but psychological, emotional, and spiritual too? I hope you share with me the feeling that this means we the people are still getting better at the pursuit of happiness.

The high moments of history have come not when humans were most concerned with the comforts and displays of the flesh but when their spirit was moved to grow in grace. What we need more of, perhaps, is an ethic and aesthetic under which humans, practicing the qualities of prudence and moderation, may indeed pass on to posterity a good earth, a diversity of wilderness.

All of us can grow in grace from the wilderness, and we can practice

wilderness management with the prudence and moderation needed to pass on our amazing wilderness posterity to our children and grandchildren. That is the burden and challenge of The Wilderness Act. George Perkins Marsh put this in perspective, in talking about his own book, *Man and Nature*, published in 1864, the same year Abraham Lincoln signed the Yosemite cession into law, the book that placed our culture on a path of environmental consciousness: "The whole force of Man and Nature lies in its assumption that the welfare of future generations matters more than any immediate consideration." The NWPS exists in this same spirit, and it extends Marsh's assumption to enfranchise all creatures with whom we share Earth. It is fully within the mission and culture of the NPS to promulgate that spirit in perpetuity—in wilderness! **IJW**

ROGER KENNEDY is director of the National Park Service.



Grand Teton National Park—established for wilderness preservation. (Photo courtesy U.S. National Park Service.)

GRANDFATHER MOUNTAIN— *A Private U.S. Wilderness Experiment*

BY RANDY JOHNSON



A winter camper stands on a promontory rock outcropping on Grandfather Mountain in North Carolina. (Photo by Randy Johnson.)

IN 1978 THE LOFTIEST, MOST SPECTACULAR peak in the southern Appalachian range of the Blue Ridge Mountains was on the verge of having restricted access to the growing hordes of hikers on the mountain's summit ridge. "Carolina's Top Scenic Attraction" boasted awesome views and eventually an "Environmental Habitat" exhibit of subtly enclosed black bears, cougars, deer, and once-wounded flightless eagles.

Like thousands of hikers lured to the woods by the 1960s and 1970s backpacking boom, I discovered Grandfather Mountain while searching the southern Appalachians for scenic grandeur. I drove up the summit road, but instead of traversing the tourist bridge, I was lured across the alpine crest of the peak on the Grandfather Trail, romantically dubbed the "Trail of Thirteen Ladders" for the wooden rungs that help hikers up sheer cliffs.

I returned often, inspired by the nearly vertical mile view that plummets down the greatest drop of the Blue Ridge escarpment. The vista is so memorable that after a climb just over 200 years ago, legendary early Appalachian explorer Andre Michuax sang the Marseilles and proclaimed the peak "the highest mountain in all North America."

The Public Becomes a Problem

Then on a visit in 1977, I encountered "No Trespassing" signs. On a trip south from New Hampshire, where I was conducting wilderness management research with the U.S. Forest Service (USFS) and Appalachian Mountain Club, I started a hike up the mountain and met a security guard; a hiker had died of hypothermia. Since management was uncertain about how to ensure public safety on its rugged, volunteer-maintained trails, hiking was being discouraged. If you did hike, a fee had to be paid at the entrance gate to the tourist area, a 12-mile round-trip away. I paid the fee, departed with a cash register receipt marked "hiking pass," and headed up the eroding trail with the decided feeling that I wasn't welcome.

No wonder hikers required the presence of a security guard to even consider paying the fee. The entire situation contrasted starkly with my New England research site where backpackers gladly paid camping fees to stay at caretaker-maintained backcountry tent sites. I decided to do something about it. My emerging professional orientation to the wilderness, and an awe-inspired sense of responsibility to this marvelous mountain, was propelling me into involvement.

Six months later, I was back at Grandfather Mountain as an idealistic young trail steward, about to encounter the entire spectrum of issues that surround the unusual task of managing a private wilderness. Not the least of those unique quandaries was how to institute user fees. After a meeting with owner Hugh Morton, I was hired to manage the wilderness tract and specifically to implement a user fee program that I assured him would work. Ideally, we'd break even (which didn't seem unlikely on my salary) and at the same time, reclaim the mountain's declining trail network.

Hiking Permits and Fees

An immediate face-lift was needed in the fee program to create a more positive impression and earn public support. Hikers, perhaps more than most people, bridle at the notion that a private individual could own a mountain, much less exploit its scenic beauty for profit. That was especially true given the mountain's image as a "developed" tourist attraction where humans and machine had obviously, it seemed, triumphed over preservation.

From the beginning, new trailhead signing was installed to contrast the mountain with nearby public lands. Hikers were told that the cost of their hiking permit wasn't an entrance charge, but a use fee intended to defray the costs of new efforts to safely and soundly accommodate public use. "Lacking public funds, isn't it worth a few bucks to insure public access and preservation of private land?" trailhead signing asked.

Further, hidden environmental protection benefits of the mountain's management were pointed out in literally thousands of personal conversations with hikers. I often contrasted public parks with the Grandfather Mountain experiment in conversations with occasionally argumentative environmentalists. I could point out that Mount Mitchell, a nearby state park capping the highest summit in eastern North America, had a road all the way to a large parking area to access a tower on the summit. Yet on Grandfather, a private owner built a road only to the first and lowest peak of the mountain, ensuring that the highest peaks and the heart of the mountain's wilderness is preserved. Such protection along with the creation and maintenance of hiking trails open to the public were a key to selling the hiking permit and fee program. Federal agencies sell trail maps to popular areas for about the price of a Grandfather Mountain hiking permit, so hikers were given a high quality map free when they bought a trail pass.

Part of the support that was eventually garnered for Grandfather's new trail program was the fact the motivation behind the improvements was obviously based on the same "wildernist" values exhibited in the management of public lands. Back-country campsites were designated with preservation and solitude (party privacy) in mind, campfires were restricted at sensitive sites, new trails intelligently dispersed use, and aggressively high standards of trail maintenance were evident everywhere. When a half century-old backpacking shelter was discovered, it was rebuilt and dedicated to the original Boy Scout builders. Interpretive signing touted the



Hikers on the Grandfather Mountain Profile Trail (above). An old rotting D. Boone Scout Trail sign in the snow in 1978 (right). (Photos by Randy Johnson.)



Scouts' early volunteerism as a precursor of the ethic embodied by the hiking permit program. Other changes eased acceptance of the new fees. The trail pass became a safety registration form instead of a cash register receipt. Permit outlets were moved adjacent to trailheads and made available at outdoor shops that became allies in the effort. Part-time help increased trail coverage, and a volunteer program formalized use of unfunded labor.

Research Lends a Hand

Research activities became an integral part of management. I was at first surprised that natural science researchers, like some hikers, somehow seemed to believe that private ownership tainted either the mountain's status as a natural area or its suitability for study. Though reluctant at first, researchers of many kinds were eventually enticed to launch studies on the mountain. The first of these deliberately informed recreation management decisions and helped convince hikers that collecting fees didn't preclude collecting data, especially when the effort was intended to provide information to protect the resource.

Eventually, hikers enthusiastically came to support the program. Hikers couldn't help but see that the hiking fees were paying for improvements to the trails. That interpretation was bolstered in 1985 with research conducted at Grandfather Mountain and the nearby Linville Gorge, a USFS managed federally designated wilderness area. Findings by William Leuschner, Phillip S. Cook, Joseph W. Roggenbuck, and Richard G. Oderwald of Virginia Polytechnic Institute strongly exemplified the notion that hikers would support trail fees if the alternative was deterioration of the wilderness. The research, published in the influential *Journal of Leisure Research* in 1987, noted that a large number of the hikers sampled had used both areas and that the similarities in ruggedness and wilderness character argued strongly for their being considered largely equivalent recreation settings, despite the user fee at the private site. Furthermore, the study showed that users of both areas displayed the kind of socioeconomic characteristics that the literature suggests



A car on the Blue Ridge Parkway viaduct on Grandfather Mountain. (Photo by Randy Johnson.)

typify wilderness users. Though fees found more support among those who had paid to use Grandfather Mountain, both groups of hikers strongly supported fees if paying them would prevent the deterioration of the area.

Obviously, dedicating the fees collected to support the wilderness program was the critical factor leading to a surprisingly high level of support for the program just seven years after it was implemented. No wonder that today the ability to dedicate fees to the park where they're generated is regarded as a key element in any plan to implement recreation fees. At Grandfather just such a program sparked a 98% fee compliance rate during the time the study was taking place.

Research on the mountain began to approach the kind of studies usually only conducted in the most noteworthy public parks. A wealth of studies led to discoveries of endangered species of bats and squirrels on Grandfather. Later, the cave was gated and a trail was closed to protect the bats. The southern Appalachians' first reintroduction of the peregrine falcon took place on the peak, a project that succeeded in part due to the commitment of the mountain and its staff. Over the years, thousands of hours of labor by Grandfather Mountain employees have aided academic and applied researchers in a variety of fields.

The Hiking Program Meets the Parkway

Hikers continued to see the mountain's environmental image improve. In 1987, the wilderness program at Grandfather also benefited from another decision that protected the mountaintop. After decades of controversy with the National Park Service concerning where the final uncompleted portion of the Blue Ridge Parkway would cross the flank of Grandfather Mountain, the road was finally completed on a lower route that was encouraged by Hugh Morton. Certainly the lower location protected the appeal of his "Mile-High Swinging Bridge" attraction, as some cynics noted, but it also further protected the mountain's backcountry—a fact that ecotourists could only applaud. For his amicable settlement of the controversy, Hugh Morton received a National Park Service award.

The delay created by the controversy led directly to the availability of bridging technology that itself greatly minimized the impact of the road. Instead of requiring a huge road cut across the fragile Black Rock Cliffs, where the road was proposed and where a gated cave protected endangered bats, a lower road location was negotiated. The road soared out away from the rocks on the S-shaped curve of the Linn Cove Viaduct, an innovative, computer-designed span.

Helping to Focus the Future

In the early years of the permit system, Hugh Morton worried that making too much of the hiking opportunities at Grandfather might deter the more sedentary. He felt the mass of visitors, now about a quarter million a year, needed to be assured that their entrance fees would guarantee an effortless stroll over the Swinging Bridge. Less than two decades later, it is the aura of wild and preserved wilderness, not to mention the lure of trails, that inspires even less active travelers. In essence, the success of private land wilderness preservation at Grandfather Mountain was due partly to the convergence of tourism and environmentalism that has recently become so visible. At Grandfather, the trend was being born years before the coining of the term "ecotourism."

Support of Wilderness User Fees

Baby boomers throughout the world have become travelers who are more than willing to pay for play, especially when it's in the outdoors and even in wilderness. That has made a success out of fee systems on public and private land. Fee-based alpine and backcountry hostels welcome hikers in Europe, New Hampshire's White Mountains, and on Mount LeConte in the Great Smokies. In Colorado, skiers, hikers, and mountain bikers have fed the growth of hut systems in the Vail and Aspen areas. Private conservation organizations have also adopted fees for use, such as the National Audubon Society and the Nature Conservancy, where they steward land resources and charges are appropriate and needed. They've adopted trail fees when public access creates added costs. In fact, to ensure the preservation of the Grandfather Mountain backcountry, the Nature Conservancy was granted preservation easements to the bulk of the mountain in the early 1990s. Hawk Mountain Sanctuary in Pennsylvania and the Mowhock Preserve in New York are other private land parcels where fees support preservation and recreation programs.

To many proponents though, the trend to fees seems hopelessly mired because politicians seem reticent to explore new trail and entrance fees. Even within North Carolina, where per capita taxpayer expenditure for state parks ranks near the bottom in the nation, proponents of the state's sparsely developed park system have vehemently fought fees. Just Mount Mitchell State Park, atop the East's highest peak (at nearly 7,000 feet), is a single access area where even a small auto entrance fee could defray park costs and send hundreds of thousands of dollars on to other parks. But the Grandfather Mountain experience isn't an argument for selling wilderness areas to private concerns. Nevertheless, it is evidence that the sense of responsibility created by economic involve-

ment can indeed be tapped for the preservation of wildlands.

The user fee dynamic has implications in both directions, for visitors and managers. As a direct source of revenue, hikers become customers. At Grandfather, most seem to appreciate that status, as well as the higher standard of trail maintenance and construction made possible by their fees. No one would support ending government funding for parks and leaving parks at the mercy of the fees they can collect. But a fee component in a park's funding certainly won't hurt the awareness of government employees that the public is paying the bills, a connection not always easy to keep in mind when the experience is "free."

Fee systems might still seem unsavory to some wilderness preservation-

ists or be considered an unknown to some managers and politicians. Nevertheless, years of experience at Grandfather Mountain show that when wilderness protection and management are balanced against the acceptability of user fees, hikers indeed can see the forest through the trees. **IJW**

RANDY JOHNSON was backcountry manager at Grandfather Mountain from 1978 to 1990 when he left to focus on a career as a freelance photo-journalist. Today, he divides his time between Greensboro, North Carolina, where he is senior editor at United Airlines award-winning magazine *Hemispheres*, and his home at the base of Grandfather Mountain in Banner Elk. He writes widely about the outdoors: His new book is *Hiking North Carolina* (Falcon Press, 1996). Contact Randy at 1301 Carolina Street, Greensboro, NC 27401, USA. Telephone: (910) 378-6065; e-mail: RanJohns@aol.com.

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WILDERNESS RECREATION IN THE UNITED STATES—

Trends in Use, Users, and Impacts

BY DAVID N. COLE

Abstract: Recreation use of the National Wilderness Preservation System (NWPS) has increased sixfold since passage of The Wilderness Act in 1964. Use is currently increasing in most designated wilderness areas. However, the wilderness visitors of today, the trips they take, and their management preferences are not very different from those of a decade or two ago. Some of the impacts of recreation use are stable, while others are worsening. Impacts to a maintained wilderness trail system were found to be relatively stable over an 11-year period. Conditions on long-established campsites only deteriorated slightly over 5- to 11-year periods. However, aggregate campsite impact has increased greatly due to dramatic increases in the number of campsites (53 to 123% increases in the wilderness areas studied). These findings suggest that problems with wilderness recreation are pronounced and increasing. More investment by management and commitment to dealing with problems is needed to meet wilderness recreation management goals.

IT HAS BEEN MORE THAN 30 YEARS SINCE creation of the NWPS in the United States. That system, originally comprising 54 wilderness areas and 9 million acres, has changed substantially. Both the number of wilderness areas and acreage of wilderness have increased more than elevenfold. The diversity of areas designated as wilderness has also increased. The largest wilderness, Wrangell-Saint Elias in Alaska, is almost as large as the entire original wilderness system. The smallest wilderness, Oregon Islands, at 5 acres, is more than 1,000 times smaller than the smallest wilderness initially included in the NWPS. Wilderness is no longer so highly concentrated in the West and in the high mountains. Designated wilderness is found in all but six states and contains about 60% of the basic ecosystem types found in the United States (Davis 1989).

Although these changes in the size and extent of the wilderness system can be readily described, relatively little information is available about change in the use, users, and condition of designated wilderness areas. Recreation use, in particular, has been a prominent use in many wilderness areas for more than half a century. We need a better understanding about trends in recreation use, recreation users, and the physical impacts they cause. This information would allow managers to grapple more effectively with current management issues and plan for the future.

Over the past seven years a coordinated series of studies has been conducted, designed to increase understanding of wilderness recreation trends. Wilderness recreation use data was analyzed over a period from 1965 through 1994 (Cole 1996). Utilizing case studies in four wilderness areas and a national park, trends in campsite conditions (Cole and Hall 1992; Cole 1993) and trail conditions (Cole 1991) were assessed over periods of 5 to 16 years. Finally, using case studies from three wilderness areas, trends in wilderness visitor characteristics over periods of 12 to 22 years (Cole et al. 1995) were assessed.

Together these studies provide the most complete picture to date of recreation trends in wilderness since creation of the NWPS. The purpose of this article is to review and integrate the findings of these studies.

Trends in Amount of Wilderness Use

Visitor-use data available from the four agencies that manage wilderness (U.S. Forest Service [USFS], National Park Service [NPS], U.S. Fish and Wildlife Service [USFWS], and Bureau of Land Management [BLM]), vary in quality, units of measure, and length and frequency of record. Using data from a variety of sources, as well as conversion factors defined in Cole (1996), estimates suggest that recreation use of wilderness has increased about sixfold since passage of The Wilderness Act, from about 3 million recreation visitor-days (RVDs) in 1965 to about 17 million RVDs in 1994 (see Table 1). Most of this increase in use is the result of additional acreage of wilderness being designated. Recreation use of the original 54 wilderness areas increased 86% between 1965 and 1994 (from about 3 million RVDs to about 5.5 million RVDs). The remaining 11.5 million RVDs of wilderness use in 1994 come from wilderness areas designated since 1964.

The questions of most relevance to wilderness managers are whether recreation use of individual wilderness areas has increased in the past and is likely to increase in the future. The answer to both questions appears to be "yes." Visitor-use data clearly indicate that (1) use increased almost everywhere during the 1960s and early 1970s, (2) use has been increasing substantially during the 1990s in most wilderness areas, and (3) virtually without exception, use of individual wilderness areas is greater now than it was in 1964. In many wilderness areas, however, use levels were stable or declining during the late 1970s and 1980s (Lucas 1989).

These trends are most clear when presented for the 54

USFS wildernesses designated in 1964 and the 58 NPS wilderness areas and major parks likely to be designated wilderness (see Table 1). In these 112 "core" areas, annual increases in use typically exceeded 10% in the 1960s and early 1970s. In the NPS areas, annual increases in use have exceeded 10% during the 1990s as well. Throughout the rest of the NWPS, use has been increasing during the 1990s but more slowly than in the national parks. The anomaly is the period of stable or declining use of the 112 core areas during the late 1970s and 1980s, originally reported by Lucas (1989). Was this a widespread trend? Did it occur in the hundreds of other wilderness areas designated since 1964? And should we expect similar cycles of declining use in the future?

None of these questions can be answered definitively. However, it appears that relatively few individual wilderness areas experienced substantial declines in use—even during the late 1970s and 1980s. Over 80% of the decline in use between 1976 and 1989 in the 112 core areas occurred in just five extremely popular national parks: Yosemite, Sequoia-Kings Canyon, Olympic, Great Smoky Mountains, and Shenandoah. Many core areas did not experience declining use during this period. For the entire NWPS, only 11% of wilderness areas experienced peak use prior to the 1980s.

Overall, these data suggest that recreation use of wilderness has increased greatly since 1964 and that use of many wilderness areas has accelerated during the 1990s. Use trends vary dramatically from area to area. Certain wilderness areas, particularly some of the most heavily used wilderness areas, experience pronounced cycles of growth and decline in recreation use, while slow and steady growth appears characteristic of the vast majority of areas.

Trends in Wilderness Visitors and Visits

Early surveys of wilderness visitors to the Boundary Waters Canoe Area Wilderness, Minnesota; the Shining Rock Wilderness, North Carolina; and the

Table 1: Recreational use of the USFS wilderness and primitive areas in human-days (prior to 1965) and of the NWPS in RVDs (since 1965).

Year	Recreation Use Thousands	Average Annual Change Percent
1946	406	—
1955	1,175	12.5
1964	2,872	10.4
1965	2,952	—
1972	5,246	8.6
1979	8,843	7.8
1989	14,801	5.4
1994	16,988	2.8

Desolation Wilderness, California, were replicated in 1990 and 1991. The details and results of these studies are described in Cole and others (1995) and summarized by Cook and Borrie (1995) in an earlier article on trends published in this journal. Prior to this work, the only detailed longitudinal study of wilderness visitors was conducted by Lucas (1985) in the Bob Marshall Wilderness, Montana.

The principal finding of these studies is that most variables have not changed dramatically over time, and for most of those variables that have changed, trends are not consistent among different wilderness areas. Only 5 of 63 variables changed substantially and consistently across areas. Three of these strong consistent trends are sociodemographic variables. The typical wilderness visitor of today is older (35 to 40) and more highly educated (40 to 50% with some graduate study) than the typical visitor of the past. The proportion of female visitors also in-

creased to 20 to 34% in 1990. The proportion of visitors who had visited wilderness areas other than the one they were currently visiting also increased, and visitor assessments of the severity of litter problems declined.

Much speculation about wilderness visitor trends has focused on characteristics of the wilderness visit, such as length of stay and group size (e.g., Roggenbuck and Watson 1988), but no wilderness visit characteristics changed substantially and consistently. However, there is some evidence of subtle changes: more solo visitors and fewer organized groups, slightly smaller groups, and shorter stays. Trend studies will be needed in more areas if we are to decide whether these are real, consistent trends. Nevertheless, studies suggest that these changes—even if they are real—are not dramatic. In contrast to Lucas's (1985) optimistic conclusions based on his study in the Bob Marshall Wilderness, we found no evidence that the impact potential of users has

Table 2: Changes in mean conditions on campsites in Eagle Cap Wilderness, Bob Marshall Wilderness, and Grand Canyon National Park.

	Eagle Cap		Bob Marshall		Grand Canyon	
	1979	1990	1981	1990	1984	1989
Campsite Area (ft ²)	2077	2217	2831	3391	549	538
Damaged Trees (#)	11	10	18	17	—	—
Vegetation Cover (%)	15	19	33	42	1	7
Mineral Soil Cover (%)	33	44	14	11	94	84



The condition of highly impacted, long-established campsites typically changes little over time. (Photo by Leopold Institute.)

declined or that use has shifted from more consumptive activities to more contemplative activities.

Visitor evaluations of wilderness conditions and their management preferences have been highly stable over time. The vast majority of visitors are extremely satisfied with their wilderness visits and rate trip quality as very good. There is no clear evidence that today's wilderness visitor is any more or less tolerant of encounters with other groups than their predecessors.

trails and leaving a few trees blown down across the trail decreased.

Trends in attitudes about the desirability of actions that enhance the naturalness of wilderness ecosystems varied among ecosystem attributes. In visitor surveys conducted in the late 1960s and early 1970s, both lightning fires and a natural fishery (no stocking and no tampering with barren lakes) were considered undesirable by two- to three-times as many people as considered them desirable. By 1990, the vast ma-

they take, and their management preferences are not much different from those of a decade or two ago. This suggests that if managers can understand their visitors and develop effective recreation management strategies, this knowledge and these programs can be used for substantial periods of time. Unfortunately, wilderness visitor studies have been conducted in only a small proportion of wilderness areas (Roggenbuck and Lucas 1987), and recreation management programs are more likely to be reactive than proactive or interactive (Cole 1990).

Trends in the Condition of Wilderness Trails

Even if visitor characteristics remain relatively unchanged, if visitors are coming in greater numbers, we might expect their ecological impacts to increase. It is also possible that impact levels could increase or decrease as a result of changes in per capita impact, changes in use distribution, the cumulative effects of use over time, or changes in management.

The condition of three trail systems in the Selway-Bitterroot Wilderness, Montana, were assessed in 1978 and again in 1989 to determine change (Cole 1991). Mean cross-sectional area of the trails (an indicator of erosion) did not change significantly over this period. Individual trail locations changed, and some eroded while others experienced deposition, but there was no net change. This corroborates the finding of the only other study of change to a trail system, a study conducted in Guadalupe Mountains National Park, Texas (Fish et al. 1981).

Although impact levels on the trail system as a whole did not change, many trail segments deteriorated markedly. This suggests that managers should focus on specific problem segments rather than on trails or trail systems. Of the factors that determine the probability that a trail will deteriorate, there is abundant evidence that use characteristics are least important (Helgath 1975; Summer 1986).

The factors that most influence trail conditions are trail location and design.

Visitor evaluations of wilderness conditions and their management preferences have been highly stable over time. The vast majority of visitors are extremely satisfied with their wilderness visits and rate trip quality as very good.

Of the management preferences that were assessed, the clearest trend was a decline in purist attitudes regarding trails. Support for high-standard trails, for building bridges over creeks (where bridges are needed only to keep feet from getting wet), and for administrative use of chain saws to clear trails increased, while support for low-standard

majority of visitors still considered a natural fishery to be undesirable while a majority supported natural fire. This suggests that visitors may only support the goal of preserving natural conditions if it does not disrupt their preferred activities.

Overall, these studies indicate that the wilderness visitors of today, the trips

The principal solutions to trail problems involve increasing the trail's capacity to withstand use (through improved design and engineering) or changing the location of the trail to one that is more capable of withstanding use (see Leung and Marion 1996 for review). Both of these are common practices. This suggests that wilderness managers know how to manage trails, they just lack the funds and other resources to deal with the many trail problems that exist.

Trends in the Condition of Wilderness Campsites

Levels of campsite impact can change as a result of either changes in the condition of established sites or changes in the number and distribution of sites. To evaluate the first of these components of change, a sample of established campsites was studied in the Eagle Cap Wilderness, Oregon (over an 11-year period), the Bob Marshall Wilderness, Montana (9-year period), and Grand Canyon National Park, Arizona (5-year period). To evaluate the second component of change, inventories of all campsites within portions of the Lee Metcalf Wilderness, Montana (over a 16-year period), the Eagle Cap Wilderness, Oregon (15-year period), and the Selway-Bitterroot Wilderness, Montana (12-year period), were conducted.

In the assessment of individual campsites, we found tremendous variation in amount of change, both between and within campsites (Cole and Hall 1992). Certain campsites improved, while others deteriorated, and others were relatively unchanged. In many cases, one type of impact increased on an individual site, while another type of impact decreased on the same site. Overall, the mean response was one of slight deterioration (see Table 2).

This finding suggests that there is little reason to be overly optimistic or pessimistic about the future condition of long-established campsites. Continued use of these sites may cause some additional damage, but the amount of additional deterioration is likely to be low in comparison to the deterioration that has already occurred. On the other hand, there is little evidence that



Among the primary causes of increasing impact problems are increases in visitation to remote places and increases in site-pioneering behavior. (Photo by Leopold Institute.)

human attempts to mitigate campsite impact have been very effective.

Changes in the number of campsites were much more pronounced and suggest the need for management action. In three studied wilderness areas the number of campsites increased markedly: 53% in the Selway-Bitterroot, 84% in the Lee Metcalf, and 123% in the Eagle Cap (Cole 1993). If these areas are typical of wilderness, they suggest that campsite impact has increased greatly over the past decade or two, primarily from the creation of new campsites rather than the deterioration of existing sites.

Many factors may have contributed to the dramatic proliferation of campsite impact. However, I believe that proliferation is primarily a result of (1) an increase in site-pioneering behavior by visitors, in many cases with the encouragement of managers, and (2) management programs that do little to attempt to decrease the number of campsites. Management programs explicitly encourage site-pioneering when they promote use dispersal; they implicitly encourage site-pioneering with many low-impact camping suggestions. They are passive when they do little to encourage use of existing sites and do not attempt to naturalize campsites that are in the early stages of development.

Conclusions and Implications

Given the substantial changes that have occurred in the NWPS, it is somewhat surprising that there have not been more profound changes in the nature and amount of recreation use and its impact on the wilderness environment. Nevertheless, although wilderness visitors themselves are little changed, amount of use continues to increase. There is every reason to think that use intensity will continue to increase in most wilderness areas in the future. The population of the United States continues to grow, as does the migration of people to the portions of the United States with the most wilderness. The nature of recreation management problems is unlikely to change greatly in the short-term, but in the absence of more effective management strategies or the allocation of more resources to existing management programs, the severity of traditional problems is likely to continue to increase.

Of the problems I assessed, campsite proliferation is the one that has intensified the most. Trail impacts are probably not as severe as they might be because substantial sums of money are regularly spent on trail maintenance.

Similarly, wilderness rangers often give considerable attention to contacting visitors and cleaning up after them on established campsites. While these management efforts need to be continued, more attention needs to be directed toward the problem of campsite proliferation.

The primary tools for combating proliferation are site designation, site restoration, visitor education and, in some places, use limitation. In popular places, management needs (1) to discourage campers from developing new sites, either by allowing camping only on designated sites or by encouraging use of established sites, and (2) to rehabilitate "excess" campsites and sites that have never been heavily impacted. In heavily used wilderness areas, use limits will increase the likelihood that these efforts will succeed, because fewer campsites will be needed. In remote portions of wilderness, management needs to encourage campers to "leave no trace" (Hampton and Cole 1995) (see also article by Swain in this issue of *IJW*) and to use sites that have not been used before. Here as well, use limits may increase the likelihood of success, because individual sites will be less frequently used. Again, restoration of all sites in these places must be a key com-

ponent of the management program.

Crowding problems are also likely to intensify if use of wilderness continues to increase and visitors' tolerance of encounters remains stable. Because attempts to disperse use more widely—one of the proposed solutions to crowding (Hendee et al. 1990)—aggravate impact proliferation problems, the alternative of use limitation may be implemented in more wilderness areas in the future.

Two shortcomings of wilderness management are highlighted in the results of these studies. First is the lack of good baseline and monitoring data. Reliable use data, the most fundamental piece of information needed by managers, is only collected in a small proportion of wilderness areas. The slow and steady growth in use reported by most wilderness areas may simply reflect the fact that most managers are guessing how much use their areas receive. Even fewer areas have reliable data on visitor characteristics and resource impacts.

Second, wilderness managers have been too reluctant to attack problems directly, with use restrictions if necessary. Two oft-cited wilderness management principles, that indirect management

techniques are best and that use limits should be a last resort, have become so entrenched in the wilderness community that they have paralyzed many management programs (Cole 1995). Once unacceptable management problems are identified, they should be attacked using techniques capable of succeeding in the short term, before the situation gets any worse.

Wilderness recreation problems are pronounced; they have increased over the past three decades and are likely to intensify, so wilderness managers must become more proactive in the future. More resources need to be expended on collection of baseline and monitoring data. Managers need to be more willing to enact restrictive management programs if unacceptable conditions are widespread. And finally, to avoid the proliferation of problems, management strategies need to be developed at the scale of entire wilderness areas (or larger) so that attempts to solve one problem in one place do not cause other problems in other places. **IJW**

DAVID N. COLE is a research biologist with the Aldo Leopold Wilderness Research Institute, P.O. Box 8089, Missoula, MT 59807, USA. Telephone: (406) 542-4199; e-mail: d.cole@bigsky.net.

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[*Editor's Note:* This issue of the *IJW* celebrates the U.S. National Wilderness Preservation System. Four federal agencies have responsibility for stewardship of wilderness areas designated by Congress within their broader jurisdiction: the Forest Service for wilderness in the National Forests; the Park Service for wilderness in the National Parks; the Fish and Wildlife Service for wilderness in National Wildlife Refuges; and the Bureau of Land Management for wilderness on public lands under their jurisdiction. The following four articles summarize the "Status and Prospects for Wilderness" in each of these federal agency jurisdictions, by the national program leader for wilderness in each agency. —John C. Hendee]

IN THE U.S. NATIONAL PARK SERVICE

BY WES HENRY

THE NATIONAL PARK SYSTEM HAS 44 UNITS with designated wilderness. The 43,149,825 acres designated as such make up 51.56% of the National Park Service (NPS) land base. Although The 1964 Wilderness Act largely originated out of a national concern over trends affecting roadless areas in national forests, it also applied to lands in the National Park System arising from concerns about the erosion of roadless areas. Twenty-five units (2,977,614 acres) entered the National Wilderness Preservation System (NWPS) in the 1970s as a result of passage of The Wilderness Act. The Alaska National Interest Lands Conservation Act brought eight new units and 32,979,370 acres into the wilderness system. Additional units added in the 1980s included Rocky Mountain National Park, Fire Island National Seashore, Cumberland Island National Seashore, Sequoia-Kings Canyon National Parks, and Yosemite National Park. The Washington wilderness bill added 1,739,771 in Mount Rainier, North Cascades, and Olympic National Parks. And finally, the 1994 California Desert Protection Act added 3,985,018 acres of wilderness in Death Valley National Park, Joshua Tree National Park, and Mojave National Preserve.

It should, however, be noted that the idea of establishing parks to maintain wilderness character far precedes passage of The Wilderness Act or individual park wilderness legislation. Due to competition with the U.S. Forest Service and anxieties of outdoor groups and dude ranchers, in the 1930s Interior Secretary Ickes worked to ensure that many new parks established then would be permanently managed, for the most part, as wilderness. Those new "wilderness" parks included Everglades, Kings Canyon, Olympic, and Isle Royale.

Wilderness Program Description

Wilderness management is an integral part of the management of the 44 units containing designated wilderness, not a separate program. This reflects the fact that superintendents, rangers, interpreters, natural and cultural resource specialists, trail crews, and many others need to be involved to make successful wilderness management a reality. However, the NPS does have a national wilderness steering committee

composed of superintendents and staff that work in conjunction with a national wilderness coordinator to address critical servicewide needs. The steering committee is currently focusing on how to improve wilderness leadership, form wilderness preservation partnerships, train NPS employees in wilderness management, and improve wilderness planning.



Harper's Corner view at Dinosaur National Park. (Photo courtesy U.S. National Park Service.)

Current Management Issues

Providing access to training and the development of wilderness and backcountry management guidelines are the current top two priorities being addressed by the steering committee. Additional issues to be addressed next year include those arising between wilderness and cultural resource management.

Current Allocation Issues

President Clinton's "Parks for Tomorrow" initiative has requested Congress to address wilderness designation in 17 national parks that cover over 5 million acres. Recommendations for their designation were made to Presidents Nixon,

Please see HENRY on page 47

IN THE U.S. FOREST SERVICE

BY JERRY STOKES



Article author Jerry Stokes.

THE U.S. FOREST SERVICE (USFS), MANAGES the approximately 190-million acre National Forest System for multiple uses including, where appropriate, timber harvest, grazing, mining, hunting, fishing, outdoor recreation, water production, and wilderness. Of the 190 million acres, about 35 million acres, or almost 18%, has been designated as components of the National Wilderness Preservation System (NWPS). The USFS manages 399 wilderness areas in 38 states. These wilderness areas comprise 34% of the entire NWPS and 63% of

the NWPS located in the lower 48 states and range in size from the 2.3 million-acre Frank Church—River of No Return Wilderness in Idaho to the 994-acre Leaf Wilderness in Mississippi.

by the public, and in 1964 The Wilderness Act was passed to give wilderness protection the security of Federal law. When The Wilderness Act passed, 54 National Forest areas totaling almost 10 million acres were designated as components of the NWPS.

In addition to designating “instant wilderness,” The Wilderness Act established general criteria for adding areas to the NWPS system, provided general guidelines for managing wilderness, and reserved to Congress the authority to classify new wilderness into the NWPS. Since the passage of The Wilderness Act, Congress has passed 72 additional legislative acts designating 345 more units of wilderness, including over 24 million acres of National Forest lands in the NWPS. There are approximately 54 million acres of undeveloped, roadless areas in the National Forest System subject to evaluation for wilderness. Of these undeveloped lands, 40 areas totaling over 4 million acres have been specifically identified by Congress to be studied (and protected in the interim) for their wilderness potential. Of those, 19 areas consisting of 2.5 million acres have been recommended by the USFS to Congress for wilderness designation. In addition, another 2.1 million acres have been recommended for wilderness designation by the USFS through its forest planning process.

Designation of Wilderness Areas

The Wilderness Act of 1964 established the NWPS to include “areas of undeveloped federal land retaining its primeval character and influence, without permanent or human habitation, which are to be protected and managed so as to preserve its natural conditions.” The USFS has a long history of involvement in the evolution of the wilderness idea and the establishment of wilderness areas. Throughout the first half of this century USFS employees Arthur Carhart, Aldo Leopold, and Bob Marshall championed the

Wilderness Politics

Designation of National Forest lands as wilderness is a highly political process in which, in most cases, prodevelopment interests are pitted against environmental interests seeking to protect these areas from development. The most controversial areas remaining in the United States to be “allocated” to either wilderness or other multiple uses are in the states of Idaho and Montana, where approximately 15 million acres are at stake. As wilderness allocations conclude in the next century, perhaps as many as another 10 to 12 million acres of National Forest System lands will be added to the NWPS.

Current Management Issues

1. Regional air pollution has adversely affected flora, fauna, water quality, and visibility in wilderness.
2. Fire suppression over the last several decades has altered natural fire regimes and inhibited fire as a natural process, thereby altering truly natural conditions in wilderness ecosystems.
3. Military and tourism overhead flights by fixed wing and helicopter aircraft have compromised the “outstanding opportunities for solitude and primitive and unconfined types of recreation” required by The Wilderness Act.



Limiting types of access will be a major key in preserving wilderness for the future. (Photo by Jerry Stokes.)

idea of setting aside wilderness areas, beginning with Leopold as early as 1913. In 1929, the USFS began administratively establishing “primitive areas” protected from development that would compromise their “wilderness character.” By 1939, 14 million acres had been designated as “primitive.” However, this administrative protection was not deemed sufficient

4. Recreation use impacts and conflicts have arisen between different types of users such as hikers and horse users.

5. Management of uses such as live-stock grazing, mining rights, and aerial access that existed prior to designation of some wilderness areas and for which Congress made exceptions in The Wilderness Act have become controversial.

6. Population growth and development on private lands near or adjacent to wilderness have created impacts from additional recreation, air pollution, fire, and have disrupted wildlife habitat and migration travel corridors.

7. Lack of any comprehensive system for monitoring social and biophysical change in the NWPS as a whole and in its individual units has been problematic.

8. It has become increasingly difficult to make and sustain management decisions to protect the various components of the wilderness resource, including wilderness experiences. As recreation use increases in popular locations, that use may exceed the limits of what is acceptable in terms of biophysical and social impacts. Increasingly, as decisions are made to assure that wilderness values are maintained, those who object seek reversal of management decisions through the USFS administrative ap-



Cattle mill along the banks of a once "wet" creek in a wilderness in the Southwest United States. (Photo by Jerry Stokes.)

peals process, suits filed in federal courts, and congressional intervention.

The Future

My vision for the future of wilderness managed by the USFS is positive. I see the enduring resource of wilderness protected, nurtured, and sustained by increasingly competent and commit-

ted managers, supported by expanded scientific knowledge and growing political support from a public that increasingly appreciates and understands wilderness. **IJW**

JERRY STOKES is national wilderness program leader for the USFS in Washington, D.C. He holds B.S. and M.S. degrees in forestry from the University of Georgia and a Ph.D. in recreation resources from Colorado State University.

Literature Review of Native Americans and Recreation: Cultural Beliefs and Outdoor Recreation Behavior

McDonald and McAvoy (1995) have reviewed 111 studies pertaining to outdoor recreation and Native Americans. They provide a useful introduction to relevant literature about Native American's participation, cultural conceptions, and attitudes and beliefs toward outdoor recreation.

McDonald and McAvoy found that leisure research has given little attention to Native American communities. Therefore, they use literature from the related concepts of cultural values; environmental attitudes and land ethics; indigenous land management; sacred sites and their continued use; parks, protected areas, and

native peoples; views of leisure; and the anthropological focus on play. The examination of literature is linked to proposed general traits shared by Native Americans. Those traits include a pervasive sacredness for all life, humans are inseparable from nature, a heightened sense of place or connection to a particular environment, belief in the cyclical nature of life, and the importance of verbal communication.

The authors also identify studies that give recommendations for conducting research on Native American people and their communities. In summary, research should meet an expressed community need and should be reviewed and approved by tribal leadership.

Establishing relationships is of paramount importance, and qualitative methodologies have had the most success because of their concordance with general shared traits. They recommend that additional outdoor recreation studies of Native Americans be conducted.

For more information see McDonald, D., & McAvoy, L.M. 1995. *A Literature Review of Native Americans and Recreation: Cultural Beliefs & Outdoor Recreation Behavior*. Minneapolis, MN: University of Minnesota Department of Kinesiology and Leisure Studies.

(This review was submitted by Greg Frieze.)

IN THE U.S. NATIONAL WILDLIFE REFUGE SYSTEM

BY PETER JEROME



Pete Jerome, U.S. Fish and Wildlife Service, National Wilderness Coordinator.

THE U.S. FISH AND WILDLIFE SERVICE (USFS) is responsible for management of 510 national wildlife refuges on over 92 million acres of lands and waters in all 50 states and 5 territories of the United States. Although other public lands provide fish and wildlife habitat, the National Wildlife Refuge System is the only federal col-

lection of lands and waters established principally for that purpose. Congressionally designated wilderness areas are a significant component of this land base.

The Refuge System has 75 designated wilderness areas on 63 refuges. They total over 20 million acres, with over 90% occurring in Alaska. With its vast and varied land and water resources, wilderness designation on refuge lands affords protection for the most biologically diverse collection of federal lands. These lands encompass habitats ranging from dwarf tundra vegetation in Alaska to subtropical mangrove keys in Florida.

Wilderness Program Description

Wilderness areas on refuge lands are managed to preserve the interaction of natural processes with the land using the minimum tools necessary to safely accomplish the Service's mission. Management activities are based on sound ecological principles and apply to Service lands where wilderness has been designated or recommended for inclusion in the National Wilderness Preservation System.

Wilderness coordination duties are integrated into refuge programs at the national, regional, and field levels with appropriate staff assigned to accomplish specific refuge management goals and objectives. Like the National Park Service, wilderness management is not a separate program on refuges but rather an integral component to accomplish specific refuge purposes. The Wilderness Act specifies that its purposes are held to be "within and supplemental to" the primary refuge purposes. Three refuges have been specifically established under the authority of the Wilderness Act: Chasshowitzka and Lake Woodruff refuges in Florida and Monomoy in Massachusetts. All other wilderness areas have been designated within existing refuges.

Management direction on refuges will focus on implementation of the Interagency Wilderness Strategic Plan prepared in 1995, which emphasizes the preservation of natural



Two adult male caribou, Arctic National Wildlife Refuge. (Photo courtesy Arthur Carhart National Wilderness Training Center.)

and biological values, the management of social values, the administrative policy and interagency coordination, and the training of agency personnel.

Current Management Issues

Because of the diversity of refuge wilderness areas, issues related to management are wide ranging. Because national wildlife refuges enjoy a high degree of protection, wilderness management has generally been compatible with long-term refuge goals and objectives. More recently, however, increasing pressures threaten not only wilderness values but also refuge resources as well.

Managing increasing public use in areas such as White Heron National Wildlife Refuge, determining the effects of proposed oil and gas development activities on wilderness values in Arctic National Wildlife Refuge, and restoring natural

Please see **JEROME** on page 47

IN THE U.S. BUREAU OF LAND MANAGEMENT

By JEFF JARVIS

THE BUREAU OF LAND MANAGEMENT (BLM) in the U.S. Department of Interior is responsible for more public land than any other agency—270 million acres. The BLM was excluded from The Wilderness Act of 1964, an omission caused in part because the issue of whether the BLM would be responsible for the long-term retention and management of public lands had not been resolved. In 1976 the issue of long-term retention and wilderness was resolved with passage of the Federal Land Policy and Management Act (FLPMA). In the FLPMA, the BLM's organic act, Section 103 directed that, in most cases, public lands would be retained in federal ownership. Section 603 of the FLPMA directed the BLM to review the public lands under their jurisdiction for wilderness characteristics and to make recommendations as to suitability or nonsuitability of wilderness designation for each area.

Program Description

In response to the passage of the FLPMA, the BLM completed an inventory of public lands and designated 27.5 million acres in 865 areas in the lower 48 states as Wilderness Study Areas (WSAs). Study of these areas was completed in 1991 and recommendations were made to the President and then to Congress for designation of certain areas as wilderness. As a result of these recommendations, Congress passed wilderness legislation for Arizona (1984 and 1990), southern California (1994), and numerous smaller bills that designated a small number of wilderness areas in other states. At this time, the BLM manages 136 wilderness areas totaling 5.2 million acres in 10 western states. Wyoming and Alaska are the only western states without BLM managed wilderness. Yet today 622 WSAs totaling 17 million acres in all the western states still await congressional action.

Current Management Issues

The BLM wilderness program's first priority is management of their 136 designated wilderness areas. Immediately after designation, priority is given to completing boundary maps and legal descriptions, locating and signing boundaries, notifying the many people directly affected by the designation, training employees to understand their new wilderness management responsibilities, and ongoing patrolling and monitoring. Over time, management emphasis shifts to developing long-term approaches to staffing, field patrols, monitoring, and compliance with use authorizations. Special projects include conducting validity examinations for potential mineral operations, reclaiming past disturbances, educating the public, completing land exchanges with state and private inholders, and responding to various proposed uses of wilderness areas.

The second priority for the wilderness program is management of WSAs that are pending legislative action by Congress. In Section 603 of FLPMA, the BLM is required

to manage WSAs "so as not to impair the suitability of such areas for preservation as wilderness . . ." This management, known as "interim management," is designed to insure that wilderness values remain intact until Congress determines if each specific area should be designated as wilderness or released for nonwilderness uses.

Current Allocation Issues

The 104th Congress actively considered wilderness designations in several states. Of these, Utah was most controversial with issues related to the amount of wilderness to be designated, special language that would allow unprecedented motorized access within wilderness, controversial exchange provisions, and hard release (no further consideration for wilderness for nondesignated areas). Other bills under consideration included (1) expansion and linkage of the Bisti and De-na-zin wildernesses in New Mexico; (2) designation of the Gunnison Gorge in Colorado; (3) designation of the King Range in California; and (4) designation of the Oregon Islands.

In addition to specific wilderness bills, the last Congress considered several bills that would affect the BLM's wilderness program, including public lands divestiture, Mining Law Reform, and amending the Alaska National Interest Lands Conservation Act. Only the Bisti/De-na-zin Bill and the Oregon Islands Bill passed.

Prospects for Wilderness

In this 50th anniversary year of the creation of the BLM, it is a full and equal partner to the other wilderness managing agencies. Congress is increasingly interested in BLM wilderness issues and will continue to designate wilderness areas under BLM jurisdiction. Depending on the future actions of Congress, the BLM could ultimately manage 20 million acres of wilderness in the lower 48 states.

Perhaps more important than the acreage managed as wilderness is the contributions these wilderness areas make to diversity in the National Wilderness Preservation System. These include (1) the opportunity to expand the diversity of ecosystems preserved as wilderness; (2) the linkages created between other agency wilderness and in some cases the opportunity to "complete" a mountain wilderness with the protection of the surrounding lower elevation lands; (3) the expansion of nontypical wilderness areas in some of the more arid lower elevations in all western states; and (4) the expansion of wilderness-dependent recreation opportunities with the long-term protection of numerous accessible areas throughout the West. **IJW**

Jeff Jarvis is the national wilderness program leader for the BLM. Jeff has worked in the BLM's wilderness program in Arizona, California, Idaho, and New Mexico. In addition, he has worked for the U.S. Fish and Wildlife Service and the National Park Service.

LEAVE NO TRACE (LNT)— *Outdoor Skills and Ethics Program*

BY RALPH SWAIN

"LNT is the most simple and honorable concept growing in the outdoor movement today. LNT is a program that everybody can be part of, take part in, and make a contribution to. Good for LNT, long may it live!"

—Royal Robbins, Owner, U.S. Outdoor Apparel Wholesaler



A "train the trainer" LNT workshop in action. (Photo by Bill Dunkelberger.)

LEAVE NO TRACE, INC. (LNT) IS AN OUTDOOR education program gaining national and international recognition. The program, developed by the U.S. Forest Service (USFS), is endorsed by several federal land management agencies including the U.S. Bureau of Land Management (BLM), U.S. National Park Service (NPS), and the U.S. Fish and Wildlife Service (USFWS). It is also embraced by a broad range of outdoor user groups including hikers, backpackers, boaters, and other recreationists. In addition, it is gaining support from the recreation industry (both retailers and manufacturers). Recently, LNT was formally organized as a nonprofit organization. The evolution of LNT reflects the contributions of many individuals and organizations.

History of LNT

LNT began in the 1970s when recreational use on public lands soared—specifically in designated wilderness. With increased use, it became apparent that outdoor education for users of the outdoors was imperative. Initially, federal land management agencies developed wilderness education programs to teach local backcountry users how to camp in particularly fragile areas like alpine lake basins and meadows.

For example, in the late 1970s one USFS educational effort that others emulated was the Eagle Cap Wilderness

(Oregon) low-impact education program developed by Jim Bradley and his staff. Called a "Human Approach," the program taught backcountry skills and ethics to wilderness visitors (Bradley 1979). During this same period, USFS managers in the Wasatch-Cache National Forest (Utah) developed a certification program for Boy Scouts to learn "Leave No Trace Wilderness Skills" and earn a wilderness skills certification card and patch. Other outdoor skills and ethics programs were developed by BLM and NPS managers to educate backcountry users about resource degradation risks unique to specific areas.

Simultaneously, outdoor education schools such as the National Outdoor Leadership School (NOLS), Outward Bound (OB), and the Wilderness Education Association (WEA) were teaching backcountry safety, orienteering, and minimum-impact skills to their students. All of these programs presented some form of low- or minimum-impact education, but consistent terminology, educational messages, and techniques had not yet evolved. Research was still lacking to guide managers and educators in dealing with the cumulative effects of concentrated use in popular backcountry areas. Most of the information offered in the 1970s and early 1980s was based on field observations and intuitive knowledge of how to reduce recreation resource degradation. Few of the educational programs were based on recreation impact studies or sound research.

In 1988, Bruce Hampton of NOLS joined with David Cole, wilderness scientist for the USFS to coauthor *Soft Paths* (1988, revised and updated 1995). This book addressed the low-impact or no-trace camping skills that reduce trampling, campsite soil compaction, campfire scars, litter, and other physical impacts. It also addressed the social impacts related to trail etiquette and consideration of other users seeking silence and solitude in a backcountry setting. *Soft Paths* became a primary reference book for recreational users, outdoor educators, and federal land managers searching for the latest state-of-the-art low-impact practices.

In 1990, the USFS and BLM expanded the program by partnering with NOLS to develop a backcountry training program (based on *Soft Paths*) to train federal land managers about techniques and skills of LNT. In the fall of 1991, 10 USFS and BLM managers pilot-tested the five-day LNT "Master" course. Upon graduation, the federal managers returned home as "LNT Masters" to share their LNT knowledge by conducting "Trainer" courses for other managers

and the general public. This “train-the-trainers” format has been very successful in expanding the cadre of knowledgeable LNT teachers throughout the United States.

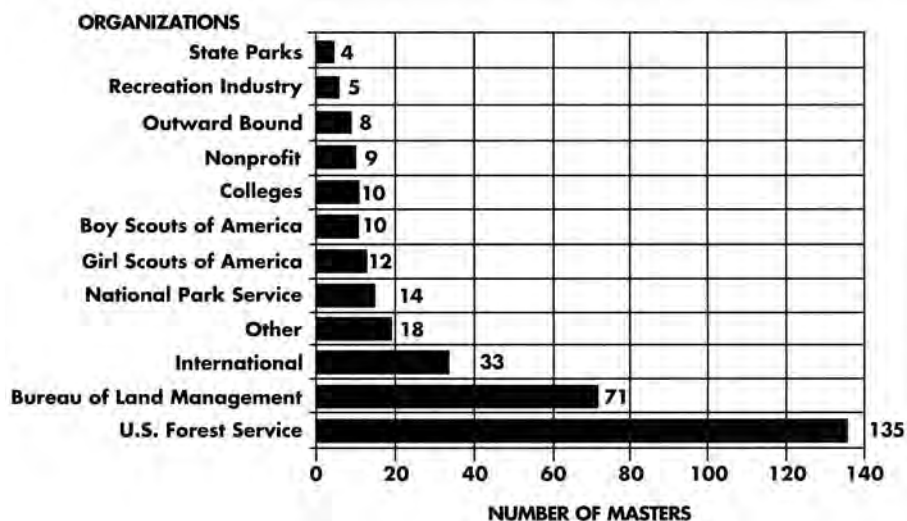
Beginning in 1991, LNT Master courses were taught in the Rocky Mountains, Southwest Desert, and Pacific Northwest. Other region-specific and user-specific courses (such as backcountry horse use) were added in 1993. As of March 1996, 300 people had graduated from LNT Master courses (see Figure 1). In 1997, 12 Master courses will be offered across the United States, addressing region-specific techniques appropriate for hiking and backpacking, canoe and rafting, sea kayaking, and backcountry horse use. The 1997 Master course dates are included in Table 1.

LNT, Inc.

The success of the Master course grew rapidly beyond the needs for training federal land managers and other outdoor educators. Clearly what was needed was a national organization and headquarters to lead expansion to the private sector and champion the combined efforts of all the partners working together to promote the LNT program. In 1994, an official Memorandum of Understanding was signed by the USFS, BLM, NPS, and the USFWS in conjunction with NOLS to develop an LNT nonprofit educational organization. In 1995, LNT, Inc., was formally established as a 501 (c)(3) nonprofit organization. LNT, Inc., collaborates its educational efforts with Tread Lightly, a nonprofit primarily targeting its educational messages to motorized users of public lands. Today, these two organizations combine their educational efforts to serve all motorized and nonmotorized user groups.

The LNT, Inc., nonprofit is based in Boulder, Colorado, and guided by a board of directors representing the outdoor recreation industry, conservation organizations, outdoor education schools, and the research community. The board of directors provides overall leadership to carry out the LNT mission in cooperation with the federal land management agencies.

Figure 1—LNT Masters* by Organization as of March 1996



*A master is a graduate of a five-day field training course.

Mission Statement

The LNT mission is to develop a nationally recognized minimum-impact education system to educate federal land managers and the general public through training, publications, video, and electronic webs. LNT addresses the physical and social impacts of non-motorized use on public lands. The educational campaign is preventive rather than restorative. Although the program is aimed at educating recreational users of public lands, the skills and ethics presented are also applicable to all: backcountry, front country, schoolyard, and backyard. The LNT challenge is to leave little or no evidence of human use or abuse and to instill a land stewardship ethic that recognizes individual responsibility.

LNT Principles

Six principles, listed in a logical order, comprise the LNT outdoor skills and ethics. These principles are not hard and fast rules, but guidelines to follow:

- plan ahead and prepare;
- camp and travel on durable surfaces;
- pack it in, pack it out;
- properly dispose of what you can't pack out;
- leave what you find; and
- minimize use and impact of fires.

Obviously, the manner in which these six principles are applied will vary from region to region depending on the unique environment and local considerations. For example, applying the appropriate skills to dispose of human waste is much different in a desert environment than in a tundra ecosystem. However, the principle—properly dispose of what you can't pack out—remains the same.

Target Regions

Applying the appropriate outdoor skills to a certain region dictated the need to develop LNT materials that would address regional environments and specific user groups. Fourteen target regions and/or user groups have been identified. As of 1996, 11 of the 14 have completed curricula and 3 are in progress.

Target Regions and User Groups with Completed Curricula:

1. North American
2. Rocky Mountains
3. Southeastern States
4. Temperate Coastal Zones
5. Western River Corridors
6. Desert and Canyon Country
7. Pacific Northwest
8. Backcountry Horse Use

Table 1: Leave No Trace 1997 Course Dates
(tentative dates)

Northeast Hiking, Bethel, ME: September 22–26
Northeast Canoe, Ely, MN: September 15–19
Tundra Hiking, Anchorage, AK: May 19–23
Western River Corridors Rafting, Vernal, UT: September 8–12
Backcountry Horse, Huson, MT: May 12–16; and TBA, CA: May 19–23
Western Hiking, Conway, WA: September 15–19
Southwest Hiking, Zion National Park, UT: April 21–25
Southeast Hiking, Shenandoah National Park, VA, May (TBA)
Rocky Mountain Hiking, Banff National Park, Alberta, Canada: June 9–13

9. Rock Climbing
10. Alaskan Tundra
11. Northeast Mountains and Forests
12. Snow Camping (in progress)
13. Caves (in progress)
14. Sea Kayaking (in progress)

LNT Educational Materials

An array of LNT educational publications complement the LNT Master courses and curricula listed above. A price list of all available LNT publications, posters, videos, t-shirts, and patches can be obtained by calling LNT, Inc., at (303) 442-8222; fax: (303) 444-3284; e-mail: <http://www.lnt.org>.

welcomed at all levels, from corporate sponsorship to individual membership. Many outdoor recreation retailers and manufacturers have joined the LNT program and are encouraging others in their industry to support the program. To recognize and support the sponsors, LNT, Inc., has established a national partnership annual award to a manufacturer and retailer. The first recipient was Trails Illustrated (manufacturer of outdoor maps) and was presented its award at the Winter Outdoor Retailers Show (January 1996) in Reno, Nevada. *Backpacker* magazine was awarded the national partnership

The LNT, Inc., nonprofit is ... guided by a board ... representing the outdoor recreation industry, conservation organizations, outdoor education schools, and the research community.

Sponsorship and Membership

LNT, Inc., is organized so corporations, organizations, and private citizens can actively participate in the national program. Membership is encouraged and

award for retailers at the Summer Outdoor Retailers Show (August 1996). Also, nonprofit environmental organizations are taking an active role in sponsoring and endorsing LNT. Through the combined effort of many partners, the LNT message is spreading.

International Efforts

The LNT program is also spreading internationally. During the past three years, an LNT Master course has been incorporated into a Belize study abroad program offered by Colorado State University in cooperation with the USFS. During the Belize LNT course, students from U.S. universities join with Belizean conservation officers and USFS/LNT Master instructors to learn how LNT principles are applied in the tropical forests of southern Belize. LNT has also been integrated into the NOLS outdoor educators courses in Mexico, Chile, and Kenya. Similarly, OB and WEA have integrated the six LNT principles into their U.S. and international courses.

Summary

What makes the LNT program so appealing was quoted at the outset: "LNT is a program that everybody can be a part of, take part in, and make a contribution to. Good for LNT, long may it live!" **IJW**

RALPH SWAIN has an M.S. degree in recreation resources (with an emphasis in wilderness management) from Colorado State University. He has been the USFS, LNT national coordinator since 1993. Ralph is presently a wilderness training specialist at the Arthur Carhart Wilderness Training Center in Huson, Montana. He is also the program manager for the interagency Wilderness Management Distance Education correspondence program. Contact him at Arthur Carhart National Wilderness Training Center, 20325 Remount Road, Huson, MT 59846, USA. Telephone: (406) 626-5208; fax: (406) 626-5395; e-mail: <http://www.nols.edu/LNT/LNTHome>.

To learn more about LNT, contact Dana Watts, LNT, Inc., P.O. Box 997, Boulder, CO 80306, USA. Telephone: (303) 442-8222; fax: (303) 444-3284; e-mail: dana.watts@nols.edu.

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WILDNESS AND WILDERNESS IN THE NORTHEASTERN UNITED STATES—

Challenge for the Coming Century

BY LLOYD C. IRLAND

[*Editor's Note:* Wilderness policymakers and environmentalists have struggled over wilderness designation in the East for several decades. While lands in the East generally have been impacted by settlement and development, many are in advanced stages of recovery on a path toward naturalness. Whether such lands ultimately could fit in the wilderness system, or could be better protected under some other designation, will be an important issue for debate.

In this article Lloyd Irland presents data on wilderness and natural area opportunities in the East with a proposal about how the protection of wilderness values might be extended. *IJW* looks forward to reader comments on his proposals about this timely issue. —John C. Hendee]

Abstract: In the northeast part of the United States (New England plus New York, New Jersey, and Pennsylvania), centuries of cutting, farming, and development have virtually eliminated virgin landscapes from the region. Of the region's 100 million acres, 15% of the rural land is being farmed. Only 12% of the forest land is publicly owned, so wider efforts to retain wildness and protect biodiversity face severe challenges. While there is little true wilderness, about five million acres (5% of the land) would fit in a more loosely defined "wild forest." I propose a long-term program of cooperative Landscape Management Areas (LMAs) that can retain important wildness and biodiversity values with lower cost and less political polarization than large acquisition programs. This program would augment a 50% increase in publicly owned wild forest, including some true wilderness. Managing motorized recreation poses a major social challenge to the region's wilderness community, because motorized uses are well established in most existing and potential wild forest units.



Article author Lloyd C. Irland.

SINCE THE DAYS OF THOREAU, NORTHEASTERNERS have appreciated wild forest landscapes. They pushed for state forests and parks as early as the 1880s with the citizen-led effort to create the Adirondack Park (Nash 1982; Graham 1978). Local citizens pressed for federal acquisition of land in the White Mountain National Forest. Maine contains a splendid example of a privately created wilderness: Baxter State Park. The few remaining scraps of virgin forest are mostly outside the region's large, formally designated wilderness areas (see Table 1). Supportive as they have been of public land systems, Northeasterners have not seen fit, outside of the Adirondacks, to allocate large areas of public land to wilderness preservation. This is partly because motorized river and trail uses are well established and vigorously defended almost everywhere. Today, about 12% of the region's forest land is publicly owned.

The forest has regrown so completely that few hikers realize that many a trail side vista was once farmed, abusively cut, or burned. Regionwide, 17 million acres of cleared land returned to forest from 1909 to 1992—an area equal to Maine's present forest area. Spreading forests and successful public programs have led to rebounding populations of eagle,

fish, bear, and other animals traditionally associated with wild country. Deer, once virtually eradicated in many parts of the Northeast, are now so abundant that they are suppressing natural regeneration and injuring habitat for other wildlife in some areas. The region currently rates low on lists of endangerment "hotspots" (Noss and Peters 1995).

The Wild Five Percent

The boundaries of the wild forest are difficult to define. The wild forest includes a range of forest lands in public and conservation ownership, whose primary objective is the maintenance of natural conditions. Defining the wild forest in strictly ecological terms as vestiges of truly undisturbed forest, important in its own right, does not define the wild forest (Crow 1990; Davis 1996). Large acreages of the wild forest are devoted to such uses as watershed protection. Perhaps a half-million acres of such lands are found in the region, and these lands may be available for limited timber cutting. But because they form large green blocks in the midst of cities and suburbs, they fill most of the functions of the wild forest. Likewise, the tiny parcels owned as green



A group of hikers in the Adirondack high country. (Photo by Gary Randorf, The Adirondack Council.)

space or preserves by towns and non-profit groups (USDA Econ. Res. Serv. 1995) are also part of the wild forest.

A listing of major wild forest units can be made, however (see Table 2). State parks and game lands are not included, though many would qualify. We could add more than a million back-country acres on the national forests, fish and game lands, state parks, and private nonprofit reservations that will

serve game, fish, and clean water supplies, or to conserve channel storage and prevent floodplain encroachment (see Table 3). Protecting water supplies was a major argument for federal acquisition of the White Mountain National Forest and for creating the Adirondack Park. Recreation, bird watching, tourism, and open-space values have been high on the list of objectives in virtually every instance. The

... I would attempt to increase the acreage in the publicly owned wild forest by 50% by the year 2020—from 5 to 7.5 million acres.

retain a generally unmanaged character. This total of, say, 5 million acres comes to about 5% of the region's land area. Of this, only a fraction is true designated wilderness. This is well below the Brundtland Commission's suggestion for 12% and compares to an estimate that true primary forest covers 0.4% of the Northeast (including Delaware, Maryland, and West Virginia) (Davis 1996).

Services and Values of the Wild Forest

Large portions of the wild forest were created for utilitarian purposes to pre-

serve game, fish, and clean water supplies, or to conserve channel storage and prevent floodplain encroachment (see Table 3). Protecting water supplies was a major argument for federal acquisition of the White Mountain National Forest and for creating the Adirondack Park. Recreation, bird watching, tourism, and open-space values have been high on the list of objectives in virtually every instance. The

Pioneering in Conservation Policy: Forever Wild in the Adirondacks

In 1827, Governor DeWitt Clinton told the New York legislature that future generations would regret the squandering of the forests. In 1864,

George Perkins Marsh advocated a major reserve.

It is desirable that some large and easily accessible region of American soil should remain, as far as possible, in its primitive condition, at once a museum for the instruction of the student, a garden for the recreation of the lover of nature, and an asylum where indigenous tree, and humble plant that loves the shade, and fish and fowl and four-footed beast, may dwell and perpetuate their kind ...

The collateral advantages of the preservation of these forests would be far greater. Nature threw up those mountains and clothed them with lofty woods, that they might serve as a reservoir to supply with perennial waters the thousand rivers and rills that are fed by the rains and snows of the Adirondacks ... (Marsh 1964)

As early as 1872, a state commission was set up to look into establishing a park. In 1880, remaining virgin growth in the Adirondacks covered about 1.6 million acres (Sargent 1884). In 1885, a forest commission was created to administer the park and acquire lands. The "Forever Wild" character of state-owned lands, and the "Blue Line" surrounding the entire park were made a part of the State Constitution by public referendum. Currently, the "Forever Wild" encompasses about 2.7 million acres of designated wilderness, and a larger area of forever wildlands.

Baxter State Park

A major wilderness is Baxter State Park in northern Maine, which protects Mount Katahdin, the northern terminus of the Appalachian Trail (see Figure 1). (A proposal to extend this trail to Quebec's Gaspé Peninsula is under development.) The park was purchased over a period of years by the late Governor Percival P. Baxter and donated to the state (Hakola 1981).

Governor Baxter specified that the park be managed in its natural state, as a "sanctuary for birds and beasts." He

modified this mandate in one corner where hunting was permitted, and in another where “scientific forestry” was to be practiced (Baxter Park Authority 1978). Baxter State Park remains New England’s largest dedicated wilderness. Adjacent to the park are several major state land units and the put-in-point for the Allagash Wilderness Waterway.

Federal Wilderness

The best-known elements of the region’s wild forest are the federal wilderness areas, which totaled about 200,000 acres in 1994. These owe their origin to the establishment of national forests and wildlife refuges earlier in this century, largely by purchase. In late 1994, only 183,000 of the 1.6 million acres of national forest land in the Northeast were dedicated wilderness, though road building and logging on much of the remaining area will be limited. Small wilderness patches exist on other federal lands.

State and Local Wild Areas

State and local governments manage thousands of acres of forest that would qualify for inclusion in the wild forest, as noted in Table 2. The largest example is the 2.7 million acre New York State Forest Preserve in the Adirondacks and the Catskills. Others range from the 14,000 acres of natural areas managed by Vermont’s Department of Forests and Parks to the 170,000 acres of designated wildlands on Pennsylvania’s state lands, and the preserve lands in New Jersey’s Pinelands. They could include Maine’s Bigelow Preserve, although timber will be harvested there. Future land use planning on state and municipal lands may result in more areas being formally designated for wilderness or wilderness.

Motors: Challenge to Wildness

Outside of the Adirondacks, restrictive categories of wilderness are relatively new to the Northeast. Much of the 5 million-acre wild forest is open to mo-

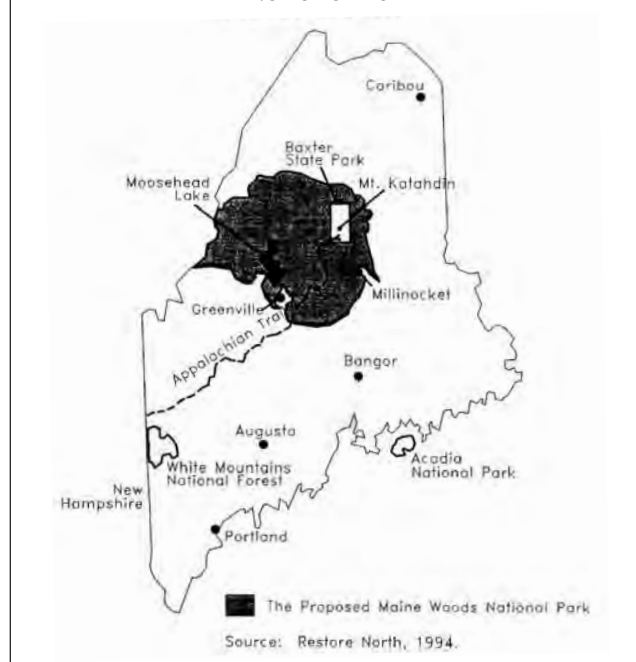
torized canoes, RVs, and snowmobiles. Wilderness lakes are reached by aircraft in summer and winter. As elsewhere, motorized woods users have enormous political clout; their organized opposition accounts in large part for the minimal acreage of public land designated as wilderness here. Considering the impacts of motors on visitor perceptions of wildness, true wilderness in the region will remain a chimera unless some way of managing the impacts of motorization is found. Whether this is even possible is uncertain. Additional designations of “wilderness” will not be able to provide visitors with solitude unless this issue can be confronted.

A Program for Wildness

I believe that a sensible conservation program for the region has two parts: land acquisition and cooperative landscape management on private land. First, I would attempt to increase the acreage in the publicly owned wild forest by 50% by the year 2020—from 5 to 7.5 million acres. A significant part of this increase should be allocated to wilderness. This would still be only 7.5% of the region’s land. The effort should focus on bolstering existing large and remote publicly owned areas, especially those with key wildlife values but would also involve private groups acquiring small, key parcels. An enlarged wild forest would be a prize bequest for this generation to pass to the future. While there are advocates of single large reserves, I think a case can be made for a more dispersed approach that would represent a greater diversity of ecosystems (see, for example, Maine Audubon Society 1996).

But public wildlands will not be enough. There are innovative ways to serve long-term land protection goals

Figure 1—Proposed Maine Woods National Park



that fit economic, social, and biological realities of this diverse region. I propose establishing designated LMAs within which targeted public support would be provided for private landowners voluntarily implementing long timber rotations, using related new forestry practices, expanding stream and trail protection, and giving up development rights. At the core of each LMA might be an area of true wilderness or some suitable public land unit. The design details do not concern us here. The idea builds on an earlier proposal by Foster (1992) for “legacy forests.” The goal is not merely to obtain development rights on narrow buffer zones adjacent to public land units. Rather, it is to secure habitat and wilderness values over naturally meaningful areas, perhaps quite large in size. Private lands in the LMAs are not included in my 7.5 million-acre proposed total for the wild forest.

Adding acres to the region’s public estate will not be the best solution in every area. Also, acquisition may not be cost-effective or politically feasible. For the 1990s at least, it is difficult to foresee any significant state or federal acquisition funding. States will be in the lead in this region, but the fiscal

Table 1: Acreages of True Virgin Forest, Selected Northeastern States

	Acres
Maine	36,000
Massachusetts*	300
New Hampshire	15,000
New York	262,000
Pennsylvania	27,000

*Berkshires only

Source: Davis, 1996, p. 21; P.W. Dunwiddie, Survey of old growth forest in Massachusetts, Nantucket: Mass. Aud. Soc., 1993, processed. See also, Maine State Planning Office, 1986, uncut timber stands and unique alpine areas on state lands, Augusta: Executive Dept.; D. J. Leopold, C. Reschke, and D. S. Smith, 1988, old growth forests of Adirondack Park, New York, *Nat. Areas J.*, 8(3): 166–187, 1988; and T. L. Smith, 1989, an overview of old growth forests in Pennsylvania, *Nat. Areas J.*, 9(1): 40–44. These earlier sources give data for particular land systems or portions of states. Just how pristine the presettlement forest actually was has been debated: Denevan, 1992. Natural area inventory efforts are well-developed in the region, e.g., McMahon 1993; Thorne 1995.

Table 2: Examples of Designated Wild Areas, Northeast, Early 1990s

Maine White Mountain NF*	12,000
Baxter Park	203,000
Allagash WW	100,600
Bureau of Parks and Lands	44,000
National Wildlife Refuge	7,392
New Hampshire White Mountain NF	102,932
Vermont Green Mountain NF	59,598
Massachusetts National Wildlife Refuge	2,420
New York Adirondack Preserve	2,310,000
Catskill Preserve	275,000

Other States:

Pennsylvania Delaware Water Gap NRA	70,000
State Forests, etc.	169,000
Allegheny NF	8,938
New Jersey National Wildlife Refuge	10,341
TOTAL	3,375,221

*On the National Forests, additional research natural areas are part of the wild forest.
Sources: Agency reports and documents of various vintage.

Table 3: Wilderness Values

1. Scientific
 - a. Preserving key ecosystems to ensure biotic diversity.
 - b. Conserving gene pools and potentially useful organisms.
 - c. Providing natural areas for research and monitoring ecosystems.
2. Economic
 - a. Providing backcountry recreation.
 - b. Conserving wildlife and fish.
 - c. Protecting watersheds and water quality.
 - d. Conserving scenic resources to benefit tourism.
 - e. Enhancing nearby real estate values.
 - f. Avoiding costs of development (services, pollution, congestion).
 - g. Promoting a balanced land use pattern.
3. Cultural
 - a. Conserving a cultural heritage.
 - b. Preserving aesthetic values.
 - c. Providing educational opportunities.
4. Ethical
 - a. Providing for biodiversity and preservation of natural processes (existence value).
 - b. Providing scope for individual freedom.
 - c. Providing for social value of exercising restraint.
 - d. Providing opportunities for bequeathing wilderness to the future.

and political climate do not appear favorable for large-scale land acquisition. In New York, a large bond proposal that included major acquisitions in the Adirondacks was voted down. Maine's governor has stated his opposition to Restore North's park proposal. Further, Maine's timber inventory situation leaves little, if any, room for trade-offs at present. It would seem wise to consider new approaches. A much richer and more wide-ranging program of policy design, public education, and advocacy will be needed on the part of the wilderness community.

Major proposals for expanding the region's wild forest include proposed additions of some 600,000 acres to the Adirondacks' Forever Wild Lands. Pro-

posals for a 3.2 million-acre Maine Woods National Park, and a 5 million-acre Thoreau National Reserve have also been offered (Kellett 1989; National Audubon Society 1994; McKibben 1995). Also, a coalition of groups has identified 10 major wildland areas regionwide for conservation efforts (National Audubon Society 1994).

Needed: A Longer View

Thoughtful scientists and citizens realize that the region's heritage of wilderness, its wildlife habitat and biodiversity values, and its traditions of public recreational uses cannot be preserved by designated public wilderness areas alone. For this reason, wilderness must be seen as an essential element in a broader effort designed to retain wilderness, biodiversity, and public access over larger landscapes. This process could be promoted through designated LMAs. More sensitive landscape management of large public forest units and industrial properties can provide many values of the wild forest over a much wider area (see, for example, Maine Council on Sustainable Forest Management 1996). We need to develop more innovative ways to secure the protection of wildlands for the future. This generation's bequest of wildness to the future is being shaped now.

A longer view is needed. The existing National Wilderness Preservation System wasn't built in a day. A long-term program focused on protecting wildness, instead of immediate designations of huge wilderness areas, will be unsatisfying to many wilderness activists. But the perfect can be the enemy of the good. I believe this proposal builds on regional traditions, recognizes financial and political realities, and would deliver major benefits. I think it deserves the support of the region's wilderness community. **IJW**

LLOYD C. IRLAND is president of The Irland Group, a Maine forestry consulting firm. He is author of *Wilderness Economics and Policy* (1979) and a work in progress, *The Northeast's Changing Forests*. Portions of this article are adapted from that work. His *Land, Timber, and Recreation in Maine's Northwoods* was recently published by the Maine Agricultural Experiment Station. Contact Lloyd at RR#2, Box 9200, Winthrop, ME 04364, USA. Telephone: (207) 395-2185; e-mail: Irland@aol.com.

Please see **IRLAND** on page 48

THE WILDERNESS SOCIETY—

Advocating for Wilderness in Changing Times

BY GREG APLET AND JERRY GREENBERG

"All we desire to save from invasion is that extremely minor fraction of outdoor America which yet remains free from mechanical sights and sounds and smells."

WHEN THE FOUNDERS OF THE WILDERNESS Society inked this phrase for the founding platform of their new organization in 1935, they could not have imagined what the wilderness movement would someday become. From an initial group of eight, The Wilderness Society has grown to an organization of over 300,000 members, and as the popularity of wilderness preservation has grown, so have other organizations pledged to protecting America's wild places. From humble beginnings early in the 20th century, the wilderness movement and The Wilderness Society have endured significant change and are now poised to convey the momentum of the past into the next millennium.

The Early Years

The story is now familiar to wilderness advocates around the world. In October 1934, on their way to a Civilian Conservation Corps camp in Tennessee, four men began arguing over Robert Marshall's handwritten draft of a constitution for a new conservation group. As the discussion heated up, they pulled off the road and gathered around Marshall, the chief of recreation and lands for the U.S. Forest Service (USFS), and went over Marshall's draft line by line. They ended the roadside session with a definite intent to form a new organization, whatever its name might be.

Three months later, in January 1935, the group met at the Cosmos Club in Washington, D.C. Participants included Robert Sterling Yard, publicist for the National Park Service (NPS) and former president of the National Parks Association (from which perch he criticized the NPS for not keeping the parks suitably primitive), and Benton MacKaye, a planner for the Tennessee Valley Authority and even then recognized as the "Father of the Appalachian Trail." After two days of rancorous debate, they adopted a platform. For a name, they settled on The Wilderness Society.

The group soon added four more carefully selected cosponsors including Aldo Leopold, a leading wilderness advocate and author of the classic work, *A Sand County Almanac*. "We want no straddlers," Marshall said. During the 1930s, the small but energetic Wilderness Society was busy. Robert Marshall continued to burrow from within the USFS, nudging the agency to expand upon its designation of primitive areas until his death in 1939 at the age of 38. So it was that The Wilderness Society joined in the effort with other conservation organizations to establish Kings Canyon and Olympic National Parks with the stipulation that each was to be



Wilderness in the Arctic National Wildlife Refuge. (Photo courtesy of Arthur Carhart Wilderness Training Center.)

managed as wilderness. Similar language was inserted into the management directives of Everglades National Park.

World War II and the infatuation with growth that characterized the boom years of the postwar period soon stalled the successful start. The USFS responded by dramatically increasing timber production from the national forests. The Bureau of Land Management accelerated grazing and mining programs throughout the 300 million acres of public lands under its control. Managers of units in the National Wildlife Refuge System were encouraged to allow farming, oil drilling, and other activities having nothing to do with the preservation of wildlife. Even the NPS became infatuated with growth, launching a program it called "Mission 66" and vowing to expand roads and tourist facilities in the parks to spectacular new levels by 1966. Almost no one in government was talking about wilderness. The movement foundered.

Then in 1950 the Bureau of Reclamation (BR) decided to build enormous dams on the Colorado-Utah border in Dinosaur National Monument. Like any national park unit, Dinosaur was by law to be kept inviolate, "unimpaired for the enjoyment of future generations." The BR turned to Congress for permission to violate the inviolable, and the conservation community, such as it was, found a cause around which it could organize.

And organize it did, led by Howard Zahniser, executive secretary of The Wilderness Society, and David Brower, the militant young head of the Sierra Club. Zahniser and Brower

joined with several other conservation leaders to form a coalition devoted exclusively to defeating the Dinosaur dams. When the smoke cleared from the congressional battlefield in 1956, the final legislation for completion of the Colorado River Project contained no dams in Dinosaur.

The Wilderness Act

Despite the victory, Zahniser realized “that all our lands are destined to be put to some human use. If any of it is to be preserved in its natural condition it must be as the result of a deliberate setting aside of it for human use of it in a natural condition.” With that conviction in mind, he produced a wilderness bill that in 1957 was introduced in Congress. The bill enabled Congress to set aside selected federal lands as areas to be kept permanently unchanged by human enterprise—no roads, no development for economic purposes, no structures, no vehicles, no significant impacts of any kind.

The Wilderness Act of 1964 states that, “A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.”

These wilderness areas would form the National Wilderness Preservation System (NWPS). Zahniser rewrote the Wilderness Bill 66 times and testified or had testimony presented before no fewer than 18 public hearings in 10 states as three separate Congresses took it up for consideration between 1956 and 1964. He testified for the last time on April 27, 1964. A week later he died, and only his memory was present in the Rose Garden of the White House on September 3, 1964, when President Lyndon B. Johnson took pen in fist and signed the final version of the long dream into law.

Protecting the Wilderness

Although truly a remarkable victory, passage of The Wilderness Act was only a beginning. At its inception, the act

designated some 9 million acres as wilderness. The hard work of identifying and designating additional wilderness still lay ahead. Through 30 years of slow, steady, state-by-state accumulation, punctuated by historic events like the Alaska National Interest Lands and Conservation Act of 1980, which designated 56 million acres of spectacular beauty, and the 8-million acre California Desert Protection Act of 1994, the NWPS has grown to 104 million acres.

At the same time that the nation was cultivating a wilderness preservation system, Congress was busy creating a framework of environmental laws governing management of all federal lands, wilderness and nonwilderness alike. Among the most important of these inspired laws was the National Forest Management Act of 1976 (NFMA). NFMA established a process for identifying the appropriate uses of the national forests through public participation in land management planning. Thus, a wholly new tool had been created for the protection of wildland: input from the growing number of Americans calling for more wilderness.

The battles over wilderness designation and forest planning defined The Wilderness Society through the 1970s and 1980s. The organization grew from a staff of 28 in 1980 to 134 in 1991, establishing offices in 15 states. State-wide wilderness bills were passed for all states containing suitable national forest wilderness except for Idaho and Montana. Forest plans were approved for most national forests, identifying over two-thirds of the land base as unsuitable for timber production. A number of forest plans were appealed and revised to protect wild places and wildlife. The Wilderness Society led the way in professionalizing the conservation movement, countering prodevelopment claims with credible, technical analyses of timber sale economics, regional economic trends, and old-growth forest inventories. Guides authored by Wilderness Society staff explained the intricacies of wilderness and national forest management to an army of dedicated forest activists who fought to protect special places from coast to coast.

By the early 1990s, the protectors of wilderness had chalked up an impressive record. To some, it looked like the work of The Wilderness Society was largely over. But even as Congress was busy protecting special places, profound change was overtaking the conservation movement.

The Next Era of Wilderness Protection

The handwriting had been on the wall for decades. The works of George Perkins Marsh, Aldo Leopold, Rachel Carson, and others had caught the attention of the public many times. But by the 1980s, the growing evidence of environmental degradation—rising carbon dioxide levels, tropical deforestation, an exploding endangered species list—forced the entire world to face the question: Can we go on living like this?

In 1987, the World Commission on Environment and Development issued its landmark report *Our Common Future*, offering an answer to that question. It recognized the relationship between healthy ecosystems and the ability to meet the needs of current and future societies and concluded that saving species and their ecosystems is “an indispensable prerequisite for sustainability.” In this context, land allocation decisions were no longer about aesthetic versus commercial preferences; they had long-lasting implications for the sustainability of our life-giving ecosystems. Wilderness protection suddenly took on new importance as a vital tool to sustain ecosystems for future generations. Protected natural areas could no longer be regarded as islands in a hostile sea; they had to be seen instead as the cornerstones of sustainable ecosystems.

Even as it continued in its traditional role of wilderness advocate, The Wilderness Society began to champion sustainability principles in public land management. From its advocacy of public lands as reservoirs of biological diversity to its role in defining sustainable forestry, The Wilderness Society began to call for management that would not simply protect wilderness, but sustain it as well. It began to focus on building a sustainable nationwide

network of wildlands. Its goals evolved from wilderness protection to creating the conditions necessary to sustain wilderness, including protecting land and changing the socially accepted norms such as laws, economic systems, and institutions that govern land management decisions.

It has become a cliché that sustainable management is ecologically sound, economically viable, and socially acceptable. Nevertheless, this notion serves as the foundation of The Wilderness Society's approach to wilderness protection for the future. Ecologically sound management sustains the complexity and dynamics of ecosystems while meeting human needs. It protects biological diversity and the productive potential of ecosystems, including soil productivity, air and water quality, and opportunities for spiritual renewal at multiple scales. It weaves protected areas, intensively developed areas, and lands managed for both natural values and other uses into an integrated, sustainable whole. Under this approach, wilderness is not apart from the managed landscape; it is a part of the managed landscape—managed for wildness. The Wilderness Society will continue to advocate for wilderness designation and management of enough land to sustain wildness, but it must also advocate management reforms across the landscape necessary to sustain a functional wildland ecosystem.

As important as ecological planning is, wildlands will not be sustained if they are at odds with economically rational allocation of resources. Historically, resource allocation has been determined by short-term market economics. Outputs for which there were markets (e.g., timber, forage, minerals, hunting, and fishing) were favored over nonmarket values such as aesthetics and backcountry access. However, this bias is breaking down as traditionally nonmarket values have been shown to contribute greatly to local economies. The beauty of natural settings and access to outdoor recreation are highly valued contributions to the quality of life in rural communities. They serve to draw new business into the community and to hold onto residents who might other-

wise be tempted to leave. A recent analysis by the USFS shows that national forest recreation contributes 30 times the commerce to the national economy as does national forest timber. The Wilderness Society has been at the leading edge of this unfolding story, contributing landmark studies of rural economies throughout the nation. At the same time, growth stimulated by natural beauty is creating new problems for rural towns, including loss of open space and a widening income gap—problems with difficult solutions. Nevertheless, recognition of wilderness as an economic asset instead of a liability means people are more likely to want it as part of their sustainable future.

Finally, ecologically sound, economically viable management can be stymied by social forces. A switch to sustainable management means change, and change does not always come easily. If we are to build a sustainable system of wildlands, it must be done with the support of people across the spectrum of interests. Conservationists must reach out to new constituencies and cultivate a love for wild places. In urban settings, this will require introducing people to the beauty and magic of the wilderness; for rural audiences, it will require cultivating an innate love of wild places into a powerful political force.

Around the country—in Alaska, in the magnificent forests of the Pacific Northwest, the Columbia River basin and northern Rockies, the Sierra Nevada, the Colorado Plateau, the southern Appalachians, and the northern forest of New England—The Wilderness Society has worked with land managers to allocate lands appropriately and to manage them well. Research has demonstrated the economic benefits of sustainable management, and The Wilderness Society has worked to develop new constituencies and to find the common ground with rural residents to ensure that our ecosystems will be sustained in the future. Indeed, at the close of the first century of U.S. conservation, the work of The Wilderness Society and other organizations has not waned, it has only increased in magnitude and importance.

Epilogue: Two Steps Forward, One Step Back

The events of the last two years demonstrate just how fragile progress can sometimes be. Soon after helping to lead the charge for the most important environmental victory of 1994, passage of the California Desert Protection Act, The Wilderness Society, like the entire conservation community, found itself confronting an extremely hostile Congress. Bills to sell off, give away, or privatize America's public lands began appearing like a bad flu epidemic. Legislation to open the Arctic National Wildlife Refuge to oil drilling, to gut the Endangered Species Act, and to transfer all 270 million acres managed by the Bureau of Land Management to the states are among the worst examples. Perhaps most disturbing have been the numerous attempts to undermine The Wilderness Act itself. Various attempts to pass precedent-setting legislation have been made, including bills that would allow motorized vehicles and industrial development in designated wilderness areas. Among the targets are southern Utah's red rock canyons and Minnesota's Boundary Waters Canoe Area Wilderness. Combining forces with other conservation groups, The Wilderness Society largely stymied the antiwilderness forces in the 104th Congress, though future assaults seem certain.

Ironically, the last two years may have laid the foundation for additional wilderness designation. The outrageous actions of the 104th Congress have shaken millions of U.S. citizens who had grown complacent about the future of the natural world. Just as the fight to save Dinosaur and the assaults of former Interior Secretary James Watt energized wilderness protection, so may the initiatives of the 104th Congress set the stage for renewed attention to the United States' dwindling wildland resource. **IJW**

GREG APLET is forest ecologist and **JERRY GREENBERG** is assistant director of communications for The Wilderness Society, 900 Seventeenth Street NW, Washington, D.C. 20006, USA.

WILDERNESS @ INTERNET

Web Page Sets the Standard

While the Boundary Water Canoe Area Wilderness (BWCAW) may be out of the way for most people, it is one of the most unique and heavily used units within the National Wilderness Preservation System. The BWCAW offers a metaphor for many wilderness issues, including the struggles between motorized and nonmotorized use, rationing, and allocation of recreational use, as well as the ability of a fragile ecosystem to sustain recreation and turbulent politics.

The BWCAW is now adding to the metaphor in another way: the internet. Through a cooperative effort between the Superior National Forest, the Minnesota Department of Natural Resources (MDNR), and the University of Minnesota (UM) an extensive BWCAW information resource has been developed for the internet (www.gis.umn.edu/bwcaw/). The information offered on this page stems from the integration of research results, fisheries surveys, Geographic Information Systems (GIS), personal essays, and managerial and visitor-oriented information.

The BWCAW internet page is developed around four topical areas. "Project Information" describes how the page was developed; "About the BWCAW" provides background information about the location and use of the area and a picture gallery and background information on some of the area's wildlife; "Trip Planning Resources" offers current news on forest fires and weather, information about the rules of BWCAW use, safety, fire, and an interactive mapping service. Links to a series of "Internet Resources" related to the BWCAW compose the fourth section.

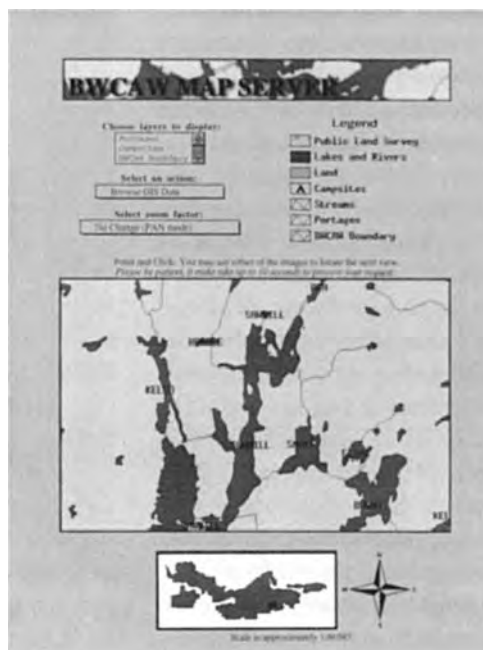
Pages are generally kept to one page, encouraging visitors to remain active and reducing user fatigue. There are high quality graphics (pictures, maps, drawings) throughout the pages. These are kept to a small enough size for easy downloading. Interactiveness is encouraged in several ways. The visitor is invited to offer information and suggestions to the "webmaster" (person who administers the page) from the footer of nearly each page. Discussions with the webmaster indicate that this tool is used, and that comments are received on a regular basis.

Site visitors also can provide easily compiled demographic and experience level information on a simple-to-use form. This form, however, is currently buried within the project information page and may not be noticed by many of the visitors. Finally, the mapping service allows each visitor to develop custom maps of the wilderness as large in scale as 1:10,000 (see Figure 1).

GIS Applications

The use of GIS demonstrates a form of the internet's real potential. Housed on a server at the UM College of Natural Resources, the presence of features such as portages, campsites, and access areas are available to people throughout the world. Site visitors are oriented to the map server capabilities and instructions for its use. The server works in two

Figure 1—BWCAW Interactive Mapping Service on the Internet



modes: browse or query. In browse mode, visitors can create views of any place in the wilderness they desire. Up to five layers of information, in addition to lakes and streams, can be included in each view. Users can zoom in or out on particular areas, with the level of information increasing with the scale of view. For example, when the scale moves below 1:55,000 the length of each portage will be displayed. A secondary map is produced for each view that illustrates the location within the wilderness it represents. Views can be printed or saved to disk as graphics files.

In query mode, detailed map coordinates or other information can be obtained for specific features within a view. For example, by clicking on Sawbill Lake in Figure 1, one can find out its ownership, description, size, depth, and clarity. This information is provided by an MDNR Section of Fisheries "Lake Information Report." Also on that report are the statistics of the number of fish by species per net in a 1993 survey, the number of fish stocked in the past five years, and a fisheries status report for the lake. Viewers are finally directed to resources for further information from the MDNR and maps.

While this page is admittedly a work in progress that will continue to improve in depth and functionality, it is currently setting the standard as an internet-based information resource for a specific area and is well worth a visit. The BWCAW internet page demonstrates the World Wide Web's (WWW) advantage in compiling a variety of public information sources into a central, easy-to-use resource. This page also demonstrates the use of emerging technology (e.g., forms and GIS) that will become pervasive in making the internet a truly interactive tool. Although most page developers will

not have access to the wealth of information available for the BWCAW, the format of this page has something to offer everyone. Interactiveness is stressed, graphics are purposeful and not overdone, the page provides a true network of interests and perspectives, and the depth and currency of the information will continue to provide value for repeat visitors to the site.

The Wilderness Information Resource Network

The expansion of wilderness information on the internet is quickly growing. My most recent Lycos internet search on the word "wilderness" returned 59,945,140 unique Uniform Resource Locators (URLs) and 16,239 documents containing the word "wilderness." Of course not all of these web sites consider wilderness in the way many *IJW* readers may, but these overwhelming figures represent the growth of the internet and its level of use by people with some type of wilderness interest.

We have all encountered frustration when the information we desired was sitting on our desks, but we still couldn't find it. The internet has the potential to broaden this frustration greatly. What do people do when they desire a specific piece of information from over 16,000 documents? When in a library, we can always ask for the help of a database expert or a clever reference librarian. The search engines being developed for the internet are filling those roles to the degree they can, but I often lack confidence that I found what I was looking for, either because my search engine didn't find it, or I missed a link somewhere.

In the May 1996 issue of *IJW* (Vol. 2, No. 1) Freimund and Queen proposed the development of a framework in which wilderness information on the Internet might become organized. We proposed that a structure could improve success in finding the information we wanted and encouraged the development of two-way communication and improved dialog. Examples of this type of organization are emerging on the internet (see <http://150.131.101.6:80/people/borrie/wil->

derness/). Additionally, a program has been developed to advance this organization of resources further.

The "Wilderness Net"

The University of Montana Wilderness Institute, the Aldo Leopold Wilderness Research Institute, the Arthur Carhart National Wilderness Training Center, and the U.S. Forest Service-Forests of Florida have entered into an agreement to conceptualize and develop a Wilderness Information Resource Network. The purpose of "Wilderness Net" is to provide access to state-of-the-art information about wilderness and promote and enhance a global dialog of wilderness issues. This network will generally follow the model proposed by Freimund and Queen in the May 1996 issue of *IJW*.

Recognizing that no facility will provide an exhaustive archive of wilderness information, early efforts will focus on identifying which types of information the wilderness community would most desire if they had access to it. The project will begin with the development of a needs assessment of people interested in the scientific, educational, or managerial products offered by the centers involved. Those documents then will be put onto a series of web pages for downloading to personal computers around the world. Work will also begin on the development of shared databases and GIS. It is anticipated that these resources will begin to come on-line in 1997.

Networking capability is among the true powers of the internet. A second function of Wilderness Net will be to develop and maintain a series of links to sites with critical wilderness information such as Bill Borrie's above-mentioned site. These sites may include philosophical, educational, legal, and managerial information or access the site-specific information that is already being posted for the visitors of many wilderness areas.

The third function of Wilderness Net relates to the improvement of dialog. A bulletin board will be developed in which wilderness issues can be discussed by people of broad interests and diverse geography. Much like *IJW*, this

Dear Editor:

I recently read an *IJW* article entitled "Wilderness @ Internet." It's about how the internet can be used to educate, inform, share research data and findings, management policies, etc. The internet is the biggest bang for our buck available for getting information out to the public. However, we walk a fine line between educating the public about their wilderness areas so that they will want to protect them, and the risk of contributing to overuse. One answer may be to highlight underutilized areas that could be controlled if overuse were to occur.

Information available for the public on registration and permits is valuable, and if an area is under quota, it may not be in danger of overuse. Internet users are a close match for wilderness users from a demographic standpoint, and this communication resource should be utilized. Any thoughts?

Marian Helling
Public Affairs Specialist
Siskiyou National Forest
P.O. Box 440
Grant's Pass, OR 97526, USA.

forum will entertain a discussion of wilderness that is broad in its ideas and geography.

To access the Wilderness Information Resource Network and participate in the needs assessment, visit www.wilderness.net. You will be asked to offer your opinions on which information would be most useful to you or your staff. If you are not currently on the WWW, please send your comments to Laurie Yung, The University of Montana, Wilderness Institute, Missoula, MT 59812, USA; call her at (406) 243-5184 or e-mail to lyung@forestry.umd.edu. Your thoughts will be appreciated. **IJW**

(These reviews were provided by **Wayne Freimund**, director, University of Montana Wilderness Institute; e-mail: waf@forestry.umd.edu.)

REGENERATING THE CALEDONIAN FOREST— *Restoring Ecological Wilderness in Scotland*

BY ALAN WATSON FEATHERSTONE



A lone Scots pine (*Pinus sylvestris*) stands in Glen Affric Caledonian Forest Reserve, Scotland (above). Article author Alan Watson Featherstone with a naturally regenerated birch in an area fenced in Glen Affric by Trees for Life in 1990. (Photo taken in 1995 after 5 years of protection from overgrazing by deer, left.) The logo of Trees for Life (below right). (Photos by A.W. Featherstone.)



rainforest ecosystem rich in ferns, mosses, and lichens. In total, forest is estimated to have covered 70 to 80% of the Scotland Highlands prior to its clearance by humans.

Scots pine is one of the most widely distributed conifers in the world, with a natural range stretching from Scotland and Spain through central Europe, from Russia to Siberia, and from north of the Arctic Circle to the Mediterranean (Steven and Carlisle 1959). Despite this vast distribution of the species, the pinewoods in Scotland are unique due to the absence of any other conifers, whereas elsewhere Scots pine is found in association with other trees such as Norway spruce (*Picea abies*) (Rodwell and Cooper 1995). The Scottish pinewoods, therefore, have significance on an international level as a distinctive component of the boreal forest

biome, now recognized by their designation as a priority habitat for conservation by the European Community in its Habitat Directive (European Community Council Directive 1992).

THE CALEDONIAN FOREST originally covered much of the Highlands of Scotland and takes its name from the Romans, who called Scotland “Caledonia,” meaning “wooded height.” This forest is mainly associated today with the country’s native Scots pine (*Pinus sylvestris*) and formed the westernmost outpost of the boreal forest ecosystem in Europe. These pinewoods are estimated to have originally covered 1.5 million hectares (see Figure 1) as a vast primeval wilderness of Scots pines, birch (*Betula* spp.), rowan (*Sorbus aucuparia*), aspen (*Populus tremula*), juniper (*Juniperus communis*), and other trees. However, in the lower-lying areas of the Highlands the Caledonian Forest was composed primarily of broad-leaved trees, such as oak (*Quercus* spp.), ash (*Fraxinus excelsior*), and hazel (*Corylus avellana*). On the west coast, oak and birch trees dominated a temperate



Figure 1—Original range of Native Pinewoods in Scotland

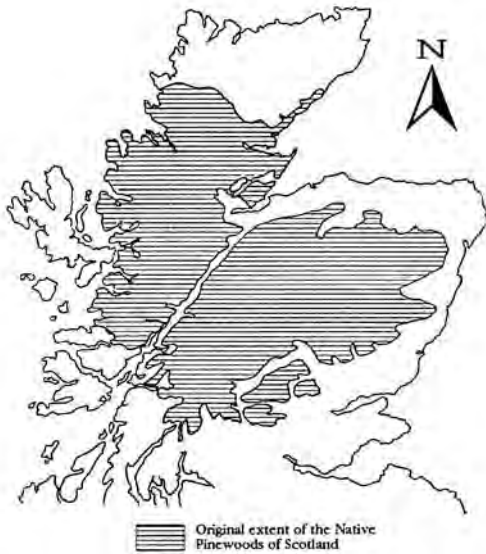


Figure 2—Existing remnants of Native Pinewoods in Scotland and the forest regeneration area envisioned by Trees for Life.



Many species of wildlife have flourished in the Caledonian Forest, including large mammals such as the beaver (*Castor fiber*), wild boar (*Sus scrofa*), lynx (*Felis lynx*), red deer (*Cervus elaphus*), moose (*Alces alces*), brown bear (*Ursus arctos*), and wolf (*Canis lupus*). In addition, several notable species of birds have lived here, including the capercaillie (*Tetrao urogallus*), the crested tit (*Parus cristatus*), and the endemic Scottish crossbill (*Loxia scotica*), which occurs only in the pinewoods.

Deforestation of Scotland

However, there has been a long history of deforestation in Scotland, with clearance of the land beginning in Neolithic times. Trees were cut for fuel and timber, boats and huts, and to convert the land to agriculture. Over centuries the forest shrank as the human population grew. It also suffered through deliberate destruction, such as when the Vikings attacked Scotland and set fire to villages, farms, and forests. Other areas were burned during campaigns to exterminate “vermin” such as the wolf, which was flushed out of the forest by the flames. Timber extraction in the 17th and 18th centuries, after the forests of England were exhausted, led to further deforestation in the Highlands, compounded by the

notorious Highland Clearances of the late 18th and early 19th centuries, when landowners evicted many of the smallscale peasant crofters from their holdings to make way for extensive sheep grazing. The subsequent rise of “sporting” estates in the Highlands—used by their owners for shooting trophy animals—led to a substantial increase in the red deer population and a resultant decline in natural regeneration of the forest. Finally, some of the best remaining areas of natural forest have been lost or seriously degraded in the 20th century by underplanting with commercial crops of exotic trees, such as North American sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta*).

Today, between 1 and 2% of the original forests survive, and the native pinewoods have been reduced to a few dozen isolated remnants, totaling 16,000 ha (Forestry Authority 1994). Gone with the trees are all the large mammals (with the exception of the red deer), the last to disappear being the wolf in the 17th century. Of the species that survive, most have been drastically reduced in numbers and range, such as the red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*), while the effect on plants, fungi, and invertebrates can only be assumed to be similar.



A red deer stag grazes beneath Scots pines in Glen Affrig. (Photo by A.W. Featherstone.)

A Wilderness Restoration Vision

It is therefore too late for wilderness protection in Scotland, as the terrestrial ecosystems (which are mainly forest) are so severely reduced in area and impoverished in diversity of constituent species. The fragments of forest that remain are now described as seminatural, reflecting their disturbed and degraded condition. The surviving remnants of

Volunteers planting Scots pines, Glen Affric, May 1994 (right). A heavily grazed pine seedling, Strathfarrar (below). A Trees for Life volunteer planting a Scots pine seedling in a deforested part of Glen Affric (below left). (Photos by A.W. Featherstone.)



the native pinewoods are links with the past; they are the last vestiges of Scotland's original forest as it was from after the last Ice Age until about 2,000 years ago. However, those remnants are running out of time, as most of them consist only of old trees. About 150 years ago the forest reached a critical point of no return, with too few trees and so many deer and sheep eating them that no young trees became es-



tablished. Although today the trees produce viable seed, and seedlings do germinate, intense grazing continuously eats them back to the level of the surrounding vegetation (mainly heathers—*Calluna vulgaris* and *Erica* spp.), and they stay at that height until they die. As a result of this human-created imbalance in the ecosystem, the remnants have become “geriatric” forests composed of old trees reaching the end of their lifespans with no young trees to take their place. Thus, the human generation alive today is the last one with the opportunity to save the Caledonian Forest and regenerate it for the future.

Meaningful conservation measures have been slow to be adopted in Scotland, and the country has the dubious distinction of being one of the very few in the world with no national parks. In England and Wales, national parks were established in the 1950s, but similar proposals for Scotland were blocked then and again in 1988 by landowning interests and political concerns. Similarly, the Cairngorms area, which contains some of the best remaining remnants of the native pinewoods, has been proposed for designation as a UNESCO World Heritage Site since at least 1983, but this has also been prevented by economic and political interests. Wilderness designation has not been given any serious consideration and would not be very meaningful at present, given the impoverished condition of the country's ecosystems.

The future of wilderness in Scotland therefore depends on ecological restoration, and in the last 30 years of work have begun to protect and regenerate some of the remnants of the Caledonian Forest. Organizations as diverse as Scottish Natural Heritage (the UK government's conservation agency in Scotland), Forest Enterprise (the state-owned body charged with timber production for the nation), the Royal Society for the Protection of Birds (RSPB—the largest conservation charity in Britain), and some private



landowners have initiated programs to regenerate the native pinewoods in particular. These efforts mainly have taken the form of erecting fences to keep deer and other grazing animals out of the remnants of the original forest so that they can regenerate successfully. However, these initiatives cover only a small part of the original forest area and have been largely uncoordinated.

To re-establish a true wilderness in the Highlands—and indeed a substantial forest—rather than just small pockets of woodland scattered in an otherwise denuded landscape, requires a larger vision. This is the need that the conservation charity Trees for Life (TFL) has responded to through its goal of linking up some of the isolated forest remnants and thereby restoring the natural tree cover to a large contiguous area of about 600 square miles in the north-west Highlands. This remote area (see Figure 2) provides one of the best opportunities for re-creating a true wilderness in Britain, as it has almost no people living in it, there are no through roads, very few economic activities take place there (except for deer stalking), and it contains three of the main remnants of the native pinewoods. The area is mountainous and contains several large lochs (lakes), while it is also large enough to contain small populations of the extirpated large mammals, which we aim to have reintroduced when there is suitable habitat for them. Despite its size, however, this area alone would not be adequate to support genetically sustainable populations of the largest of the missing mammals, as species such as wolves and bears require a large range in which to live. Thus, we envision linking the area outlined above to other sites of restored forest in the Highlands by creating corridors of natural habitat.

Ecological Restoration Strategy

We have a threefold strategy for the return of the forest. First is to facilitate the natural regeneration of the trees by fencing the deer out of areas on the periphery of the existing remnants, which will permit seedlings to grow



Scots pines (*Pinus sylvestris*) and silver birches (*Betula pendula*) in autumn, overlooking Loch Benevean, Glen Affric Caledonian Forest Reserve, Scotland. (Photo by A.W. Featherstone.)

naturally to maturity again without being overgrazed. This is the simplest and best method of regenerating the forest, as it involves the minimum of intervention and allows nature to do most of the work—one of the basic principles of ecological restoration (see Table 1). However, this approach only works in locations where there is an existing seed source nearby, which is not the case in the treeless expanses that make up most of the Highlands today. The second part of our strategy applies in these situations, to areas where there aren't nearby seed sources: native trees are planted in barren areas where the forest has disappeared completely. To do this, we collect seed from the nearest surviving trees to maintain the lo-

cal genetic variation in the forest. The resulting seedlings are then planted in a random pattern inside fenced enclosures, replicating the natural distribution of the trees. We work with all of the native trees from the forest, and pay particular attention to the pioneer species, such as birch, rowan, and aspen, as they have an important role to play in the succession of the forest as it gets re-established.

The third part of our strategy involves the felling of nonnative trees, which in some areas have been planted as a commercial crop amongst the old trees of the Caledonian Forest remnants, thereby preventing their regeneration. These felled exotics are not extracted but are left to decompose in situ so that



Propagation of aspen from root sections. (Photo by A.W. Featherstone.)

the nutrients they contain are retained within the forest ecosystem instead of being exported and not replaced.

With this threefold strategy, it is our intention is to reestablish “islands” of healthy young forest scattered throughout the barren, deforested glens. As these new trees reach seed-bearing age they will form the nuclei for expanded natural regeneration in the surrounding area. While the trees in these “islands” are growing, it will be important to reduce the numbers of deer so that the forest restoration process can become self-sustaining, without the need for further fences. At that stage, we expect that the existing fences can also be dismantled so that the human intrusion into the landscape can be minimized, enhancing the quality of the restored wilderness. As the trees grow, some of the other woodland species will return by themselves. Still other species will need to be physically reintroduced to the regenerating forest when the habitat can support them.

Practical Applications

Practical work on our project began in 1989 after several years of preparation, when TFL volunteers protected naturally occurring Scots pine seedlings with plastic tubes in two forest remnants in Glen Cannich. Safe from grazing deer, these seedlings grew until a larger area around them could be fenced, and this has been done since by the landowners of those areas. From that small beginning, our work ex-

panded in 1990 when we funded the fencing of an area of 50 hectares on the periphery of the forest remnants in Glen Affrig, where we operate in partnership with Forest Enterprise, which has its own program for regeneration of the Caledonian Forest.

The first area that we fenced was the subject of a scientific study by a student from Edinburgh University in 1990, just before the fence was erected. His data

showed that in the area enclosed by the fence there are approximately 100,000 pine seedlings, which are on average 9.9 years old (Blanchflower 1990). Some of the seedlings were up to 27 years old but only 8.5 centimeters (3.3 inches) high, demonstrating how serious the grazing damage has been! Ninety-five percent of the seedlings had sustained grazing damage, and of the remaining 5%, the majority were one-year-old seedlings that were too small to be seen by the deer amongst the surrounding heather (Blanchflower 1990). By excluding deer from that area, seedlings inside the fence are free to grow to maturity for the first time in over 150 years. In 1996 we are doing a follow-up study to evaluate the effects of six years' protection from grazing.

Since 1990, we have funded the fencing of an additional four areas in Glen Affrig, totaling 109 hectares, with another two scheduled for the spring of 1996. Some of these are purely for natural regeneration of the trees that are already there, while the others have combined natural regeneration with planting. To date our staff and volunteers have planted over 100,000 trees, mainly Scots pines, but also birch, aspen, hazel, and goat willow (*Salix caprea*).

Aspen is a species that we are paying particular attention to, as it now rarely reproduces by seed in Scotland. This is mainly due to the fact that its range has been drastically reduced, and it survives as isolated clumps of single-sexed clones, all grown from a single parent tree. For these clumps, often

many kilometers apart, sexual reproduction is virtually impossible, and the intense grazing pressure prevents the spread of aspen by ramets (root suckers). For several years now we have been mapping out the sites where aspen grows in Glen Affrig, and each spring since 1991 we have been collecting root sections from the trees in some of these sites. In a greenhouse we propagate new plants from these roots, and after a year we plant the resultant saplings inside fenced enclosures in the glen. Seeking to mimic nature as closely as possible, we choose planting sites for them where the conditions correspond to those of the mature aspens in the glen—drier south-facing areas, preferably amongst some exposed rocks.

We plant them out in mixed clumps of five or six trees, with each tree in the clump coming from a different parent stand of aspen. In doing this, we seek to ensure that there is at least one male and one female in each clump, so that sexual reproduction will become a possibility again when they reach maturity. We are also facilitating the regeneration of the other rare trees in the pinewoods of Glen Affrig, including oak (*Quercus robur*), juniper, hazel, holly, and willows (*Salix caprea*, *S. aurita*). The willows are being propagated from branch cuttings, while we've been protecting individual naturally regenerating oak seedlings with tubes to prevent them from being grazed by deer. We also have begun a mapping program for these species so that we can chart their distribution using Geographic Information Systems software on our computers.

A major element of our work is our volunteer program, in which individuals take part in week-long work camps out in the forest. These efforts provide the participants with a meaningful experience of working with others on positive action to help restore Scotland's forest heritage, thereby addressing the global problem of deforestation through the healing of Earth. Hundreds of people, ranging from teenagers to 70 year olds, have taken part in these week-long volunteer efforts since 1991, discovering that they can make a positive contribution, with many receiving

a powerful transformative experience.

In the 10 years since our work began, there has been a greatly increased awareness of Scotland's native pinewoods and an upsurge of initiatives to regenerate them. Our work both on the ground and in publicizing the plight of the forest remnants has contributed to this shift, but few of those projects are considering anything other than the trees, particularly the Scots pine. Our interest lies in the whole forest ecosystem and in the restoration of a wild forest, rather than one that will be used by humans for economic extraction, even on a sustainable basis. Thus we are now seeking to move the discussion in Scotland, and indeed the practical action on the ground, forward through our advocacy for the reintroduction of extirpated fauna. There are signs of progress here too, as Scottish Natural Heritage is currently carrying out a full-scale feasibility study, based on World Conservation Union guidelines, into the possible reintroduction of the beaver to Scotland. TFL is a partner in the Highland Wolf Fund, which is raising money to carry out a similar study into the possible return of the wolf, a subject that has gained considerable interest recently among students in conservation-related courses at British universities, and in the UK national media. For the first time, we are witnessing discussion about the possible return of true wilderness to Scotland.

Critical problems remain, however, not the least of which is Scotland's feudal-like system of landownership, which is one of the main reasons why the forest has continued to decline in this century. The Highlands are like a third-world country in that there has never been any type of land reform here, and a very small number of people own the vast majority of land in huge estates. Most of these owners live either in the south of England or abroad, and individual holdings of 10,000 acres are common. Many of the owners are

foreigners, including an Arab prince, Dutch and Danish businessmen, and a mysterious Malaysian or Indonesian tycoon whose identity is kept secret. These people often have no interest in or incentive to regenerate the forest and, as long as large tracts of land are in their hands, many parts of the Highlands will remain in a bleak, impoverished and treeless state. In early 1995 TFL placed a bid to purchase the 10,000-acre Wester Guisachan Estate in Glen Affrig, having received grant

serve by Forest Enterprise in 1994, and the area attracts increasing numbers of visitors each year because of its wild and scenic qualities. Visitor numbers bring their own set of problems, but these can be managed. The Highlands of Scotland, with their low human population density, offer one of the best opportunities in all of Europe to re-create a wild forest landscape covering a substantial area. Through the work of TFL and other organizations, I expect that in 250 years the present impoverished and degraded state of the Highlands, and the reduction of the Caledonian Forest to 1% of its former area, will soon be seen as a brief and misguided episode in the continuous evolution of wilderness in Scotland. Further, the ecological restoration efforts of TFL will be one of many worldwide seeking to heal Earth.

This global perspective forms the larger context within which our efforts take place. With deforestation and other forms of ecological degradation now worldwide phenomena, we believe that ecological restoration—the healing of Earth—will become an international priority in the next century. For wilderness to be a meaningful reality for future generations, it is not enough to just protect the shrinking areas of pristine nature that still survive on the planet. To provide a habitat for the millions of species with which we share the planet, we

also need to reverse the environmental destruction that already has taken place in ecosystems all over the world. To do this successfully in the decades to come, we need pilot projects right now in the various climate zones and ecosystem types on the planet, to elucidate and demonstrate the techniques by which ecological restoration can be effective. Thus, we see our work as relevant not only in Scotland and the United Kingdom (TFL was declared the UK Conservation Project of the Year in 1991)

Please see Featherstone on page 47

**Table 1: Principles of Ecological Restoration
Used by Trees for Life**

1. Mimic nature wherever possible.
2. Work outward from areas of strength, where the ecosystem is closest to its natural condition.
3. Pay particular attention to "keystone" species—those that are key components of the ecosystem, and on which many other species depend.
4. Utilize pioneer species and natural succession to facilitate the restoration process.
5. Re-create ecological niches where they've been lost.
6. Re-establish ecological linkages—reconnect the threads in the web of life.
7. Control and/or remove introduced species.
8. Remove or mitigate the limiting factors that prevent restoration from taking place naturally.
9. Let nature do most of the work.
10. Love nurtures the life force and spirit of all beings, and is a significant factor in helping to heal Earth.

offers to meet the asking price of £450,000. However, the estate was sold to a businessman from Holland who made a higher offer, and another piece of prime land for forest restoration in Scotland passed into foreign ownership. Though in this case it seems as though the new owners will carry out some forest regeneration work on the estate.

However, the importance and value of wilderness is being recognized by more and more people in Scotland and throughout the United Kingdom. For example, 9,000 hectares of Glen Affrig were declared a Caledonian Forest Re-

WILDERNESS PROGRESS IN NAMIBIA

BY LAUREL MUNSON-BOYERS



Waterberg Plateau Park (above). (Photo by Vance G. Martin.) Trygve Cooper, chief warden, Waterberg Plateau Park; Vance Martin, Executive Director WILD/ICEC; Ian Player, Wilderness Foundation, RSA; Ben Uulengha, Namibian Ambassador to the United Kingdom. (left to right)

IN JUNE 1996, A REMARKABLE SYMPOSIUM convened in the Republic of Namibia, in southwest Africa.

The symposium was historic, as it was the first professional gathering focused on wilderness designation and management on the African continent, outside of South Africa. Up to 100 participants, mostly Namibian but also including representatives from seven other countries, provided current perspectives and advice to Namibians on wilderness designation and management. The symposium occurred largely through the concerted and persistent efforts of Trygve Cooper, chief warden, Waterburg Plateau Park, the site of the symposium approximately 150 miles (250 km) north of the capital city of Windhoek. Financial support from USAID mission in Namibia, the Rossing Foundation, and 20 additional sponsors made the symposium possible.

In addition to being historic, the event was also remarkable in that it occurred in a developing country already struggling with 35 to 40% unemployment, 30 to 40% illiteracy, and a slowing economy overdependent on mining revenue. Therefore, the issues facing Namibian wilderness designa-

tion are complex. Principle among these are economic, political, and cultural issues. As always, the economic issue was paramount at the symposium. Kulani Mkhize (Natal Kwazulu Department of Conservation, South Africa) summarized the consensus succinctly by saying, "A depressed economy almost guarantees a degraded environment."

The symposium received good political attention. State President Dr. Sam Nujoma sent an encouraging message, as did U.S. Vice President Al Gore. Namibian's Deputy Minister of Housing (now ambassador to London), Ben Uulenga, attended the entire symposium as did the regional governor. While acknowledging the importance of designating and maintaining areas as wilderness, political figures present confirmed that politicians in general were too concerned with basic issues of education, economics, and water to give much priority to wilderness.

The cultural challenge is perhaps the greatest and came from two sectors. Wilderness designation and nature conservation are seen primarily as concepts of the white minority in a land that is 86% black. This is changing, with some notable projects of community-based nature conservation in several areas. The principle emphasis from Namibia and other Southern African countries is the importance of local people receiving sustainable economic benefits from tourism or wildlife utilization so that they can take the wilderness concept seriously. In addition, a cultural barrier exists to some degree within the ranks of professional conservationists, stemming from ingrained habits of four-wheel drive access to remote areas.

As a result of this symposium, a series of recommendations are being presented to the Ministry of Environment and Tourism as hopeful steps toward legal designation of wilderness. Areas in existing parks will be the priority, but park wardens will be asked to provide inventories of other suitable or potential areas outside of parks in coordination with local communities. Simultaneously, the Namibian Nature Foundation will follow several promising leads from private landowners who are interested in the concept. Finally, education and training for conservation professionals was deemed a high priority. Namibia's first wilderness management training seminar convened for five days immediately following the symposium. Paul Winegart (U.S. Forest Service, retired, and associate of The WILD Foundation) led the training with Drummond Densham of the Natal Parks Board (South Africa).

This symposium was a first and most important step to long-term protection for the spectacular and silent expanse of Namibian wildlands, for the benefit of all Namibians. **IJW**

LAUREL MUNSON-BOYERS represented Yosemite National Park (where she is wilderness unit manager) at the Namibian symposium.

ANNOUNCEMENTS AND WILDERNESS CALENDAR

- **HELICOPTER LANDINGS PROPOSED IN TONGASS NATIONAL FOREST WILDERNESS AREAS**
- **YELLOWSTONE CUTTHROAT IN PERIL**
- **WILDERNESS WATCH FORMS SEVEN LOCAL CHAPTERS**
- **WILDERNESS THERAPY**
- **RUSSIAN CONSERVATION NEWS BULLETIN NOW AVAILABLE**
- **ITALIAN WILDERNESS SOCIETY NEWS**
- **STUDENT ECOJOURNAL**
- **WILDERNESS WATCH FACILITATES PRIVATE MANAGEMENT**
- **BULLETIN BOARD EFFECTIVENESS ANALYZED**
- **MOLLIE BEATTIE WILDERNESS AREA ACT OF 1996**

Helicopter Landings Proposed in Tongass National Forest Wilderness Areas

The U.S. Forest Service (USFS) proposes to allow 1,265 helicopter landings per year in designated wilderness areas on the Tongass National Forest in Alaska, USA. This is an unprecedented assault on the integrity of the whole National Wilderness Preservation System, The Wilderness Act, the Alaska National Interest Lands Conservation Act (ANILCA), and the Tongass Timber Reform Act. In the Helicopter Landings in Wilderness, Draft Environmental Impact Statement (DEIS), the USFS has proposed a preferred alternative 3B that would allow up to 1,265 helicopter landings per year at 129 sites in 12 of the 19 designated wilderness areas on the Tongass National Forest.

Neither The Wilderness Act nor ANILCA allow such use of helicopters for private or commercial public tour landings in designated wilderness areas on the Tongass National Forest or anywhere else. This action would set a precedent that could open all wilderness to motorized access. The USFS's own DEIS shows that there will be significant negative impacts from helicopters on wilderness and its wildlife and cultural values. Helicopters are not "traditional" in wilderness! For more information contact The Wilderness Society at (907) 272-9453.

Yellowstone Cutthroat in Peril

The cutthroat trout is in serious danger from the illegal introduction of lake trout into Yellowstone Lake, USA. Lake trout are voracious predators of the cutthroat; their entry into Yellowstone Lake was prohibited for exactly that reason. Scientists have found the fish at various ages and locations, leading them to believe there are thousands breeding in the lake. Cutthroat are a source of food for the park's

grizzly bears, osprey, pelicans, and otters and support a multimillion dollar industry in sport fishery in and around the lake. The possibility of completely eliminating the lake trout seems slim; at best, scientists hope to keep numbers in check by establishing an intensive gill netting program and encouraging fishermen to seek and kill lake trout. (Excerpted from *Taproot*, a publication of The Coalition for Education in the Outdoors, 1996.)

Wilderness Watch Forms Seven Local Chapters

Wilderness Watch (WW), USA, recognized long ago that it would be virtually impossible for their small staff in Missoula, Montana, to adequately monitor every designated wilderness and Wild and Scenic River in the United States. They have, therefore, set a long-term goal to have local chapters watching over each and every wilderness and wild and scenic river.

According to Executive Director Janet Rose, "WW strongly believes that chapters are critical to the success of Wilderness Watch. They are our eyes and ears at the local level where most 'wilderness watching' must occur, and they provide a means for WW members to stay abreast of actions affecting wildernesses and wild rivers."

WW currently has seven local chapters working for wilderness and wild rivers around the United States. Some chapters monitor a single wilderness, while others cover a much larger geographic area. These chapters include (1) Central Sierra, Twain Harte, California (Emigrant, Carson-Iceberg Mokelumne, Hoover, N. Yosemite); (2) Eastern Sierra, Crowley Lake, California (Ansel Adams, John Muir, Sequoia-Kings Canyon, Golden Trout, South Sierra); (3) Cloud Peak, Sheridan, Wyoming (Cloud Peak); (4) Southern Wildlands and Rivers, Pasadena, Texas (Texas, Arkansas, Oklahoma, Louisiana, Mississippi); (5) North Cascades, Woodinville, Washington (Pasayten, Lake Chelan-Sawtooth, Boulder

River, Glacier Peak, Mt. Baker, Noisy-Diobsud, Alpine Lakes, Henry M. Jackson, Stephen Mather); (6) Hellgate, Missoula, Montana (Selway-Bitterroot, Anaconda-Pintler, Welcome Creek, Rattlesnake, Cabinet Mts., Bob Marshall Complex, Lee Metcalf, Gates of the Mountains, Absaroka-Beartooth, Red Rock Lakes); and (7) Friends of the Missions, Condon, Montana (Mission Mountains).

Affiliation with a local WW chapter is free. You'll receive timely alerts and notice of chapter events, workshops, field trips, and social gatherings as well as newsletters and other important information from our national headquarters. If you would like to become a member of one of these chapters, contact Wilderness Watch, Box 9175, Missoula, MT 59807, USA. Telephone: (406) 542-2048; e-mail: WILDWATCH@igc.apc.org.

Wilderness Therapy

Dr. Jennifer Davis-Berman and Dr. Dene S. Berman offer a thorough examination of the use of wilderness as a therapy tool in their book *Wilderness Therapy: Foundations, Theory and Research*. This text is unmatched in the field for providing a step-by-step outline for understanding the history, use, and development of wilderness therapy, including current research, methods for programming, and suggestions for interacting with schools, mental health organizations, and the courts. Offered by the American Camping Association, 5000 State Road 67 North, Martinsville, IN 46151-7902, USA. Telephone: (317) 342-8456. (Excerpted from *Taproot*, a publication of The Coalition for Education in the Outdoors, 1996.)

Russian Conservation News Bulletin Now Available

Russian Conservation News is a quarterly informational bulletin featuring current articles by leading conservation biologists, policy makers, and environ-

mentalists from the former Soviet Union. Each issue (16 to 30 pages) is packed with maps, diagrams, photographs, and news about protected areas, parks, and nature reserves; conservation legislation and management; urgent issues facing the environment in the former Soviet Union and general problems and organizations working to solve them; conservation finance, funding priorities, and achievements; and endangered species and ecosystems.

One year subscription prices (U.S.\$): Student \$20, Individual \$25, Organization \$35. To subscribe write, Russian Conservation News, PEEC/RCN, R.R. 2 Box 1010, Dingmans Ferry, PA 18328, USA.

Italian Wilderness Society News

The Italian Wilderness Society has a new center. Please note the new address: Via Augusto Bonetti n°42 - 17010 Murialdo (SV), Italy. Telephone/Fax: 0863-949322.

Student Ecojournal

Students at the Paul Revere Middle School in Houston are going nationwide with the production and distribution of their environmental science journal *Earth Focus*. Submissions are encouraged and the journal will pay for those reports and articles it is able to publish. Subscriptions are \$9 for two issues/year from: Earth Focus, Paul Revere Middle School, 10502 Briar Forest, Houston, TX 77402, USA. (Excerpted from *Taproot*, a publication of The Coalition for Education in the Outdoors, 1996.)

Wilderness Watch Facilitates Private Management

Wilderness Watch (WW), a national nonprofit citizen organization headquartered in Missoula, Montana, planned a cost-share agreement with the U.S. Forest Service (FS) to help keep two rangers in the Mission

Mountains Wilderness throughout the 1996 season.

According to Janet Rose, executive director of WW, "Friends of the Mission Wilderness Watch Chapter raised \$12,000 to match FS funding to continue patrols, trail maintenance, and other management in the Mission Mountains Wilderness."

IJW applauds this help by WW in times of downsizing and cutbacks that are severely impacting wilderness management.

Bulletin Board Effectiveness Analyzed

David Cole at the Aldo Leopold Wilderness Research Institute, USA, reports results from experimenting with means of increasing the effectiveness of bulletin boards as a low-impact communication medium in the Selway-Bitterroot Wilderness. Findings include: (1) hikers' knowledge of recommended practices was increased by posting messages; (2) horse users seldom gave any attention to messages on bulletin boards; (3) two messages were about all that hikers could absorb; and (4) including a banner that said "please take the time to read these messages" doubled the amount of time visitors spent looking at the messages. For more information contact e-mail: d.cole@bigsky.net.

Mollie Beattie Wilderness Area Act of 1996

On June 27, 1996, Mollie Beattie, director of the U.S. Fish and Wildlife Service, died after a year-long battle with brain cancer. As a deserving tribute to Mollie, President Clinton signed into law S.1899, the Mollie Beattie Wilderness Area Act on July 26. Under this legislation, Mollie Beattie's name will be forever associated with one of the most wild and beautiful places on this planet—the Brooks Range of Alaska's Arctic National Wildlife Refuge. Mollie was an advocate and ardent supporter of our nation's wilderness heritage.

BOOK REVIEWS

BY JAMES R. FAZIO, BOOK REVIEW EDITOR

Wilderness Ethics—Preserving the Spirit of Wilderness by Laura and Guy Waterman. 1993. The Countryman Press, Woodstock, Vermont. 239 pp., \$14.00 (paperback).

[*Editor's Note:* We violate *IJW* policy in this review by including a book not published within the past two years. We make the exception because this is a book that is so central to the wilderness theme that we believe all our readers should know about it. —J.R.F.]

Wilderness Ethics is not a book about low-impact camping techniques. That topic was covered in an earlier book, *Backwoods Ethics* (1979), by the same husband and wife authors. *Wilderness Ethics* goes far beyond techniques, instead penetrating to the very soul of wilderness. This book revolves around three key questions. What are we trying to preserve? What are the threats to the wildness in wilderness? What can we do about it? The Watermans offer answers to these compelling questions, but more importantly is that they place the questions before us and put them into perspective with well-chosen case studies.

The authors are not academics or scientists. Rather, they draw on a lifetime of hiking, climbing, and observing wilderness in all seasons of the year. Their land is primarily the high, wind-battered mountains of New England. In one way, this is the book's only weakness, as it results in the omission of important western issues such as fixed wing aircraft, horse use, and hunting methods, and international issues such as the dilemma of ecotourism. But most of the concepts discussed in *Wilderness Ethics* can easily be applied to any wild area in the world.

To the Watermans, the soul of wilderness is not place as much as it is experience. Their thesis is that both personal behavior and management in wilderness should be geared to protecting the freedom to discover; to risk; to experience mystery, confusion, and difficulty of access; and to be free of the machines and electronic devices of other places. The authors implore us to clearly define wilderness values, then to use these to guide decisions that range from the use of radios and telephones to the easy availability of rescue.

Be warned. You are likely to find your sacred cow in this book. For example, researchers are called to task for putting wilderness "users" (the authors' quote marks) under the microscope of social science. Nor do they see the zeal for science as an excuse for shattering the solitude of wilderness with the roar of helicopters, or decorating remote forests

with plastic ribbons, driving steel pegs in tundra areas, or even pursuing and dragging free-roaming bears.

Researchers and managers are seen as "the new exploiters" of wilderness when they fail to base their actions on the true spirit of wilderness. Social "do-gooders" are branded with the same iron. The authors cite examples ranging from "supervised gangs from the inner city" to "military elite units," then conclude: "the point is not so much whether there is value in these programs as whether, on the scale they are currently on

and the scale to which they appear to be headed, the backcountry can endure their presence without jeopardy to other values." In even more daring questioning, the Watermans build an argument that "the rights of the physically hardy should be defended just as vigorously as the rights of the physically limited."

Wilderness Ethics is an outstanding piece of literature, as artistically crafted as it is thought-provoking and practical. Points are presented not with the citation of dull scientific data or obfuscated philosophy. Instead, concepts are clearly presented, logically argued, and illustrated with personal experience, much of it in the vein of high drama. This rare combination results in a book that could supplement texts in formal courses on wilderness management as easily as it might serve as an excellent gift for any outdoor enthusiast. In fact, if *IJW* were to recommend a basic library for anyone interested in wilderness, *Wilderness Ethics* would be my candidate for the list.



Book review editor James R. Fazio.

Landscape Approaches in Mammalian Ecology edited by William Z. Lidicker Jr. 1995. University of Minnesota Press, Minneapolis. 215 pp., \$35.00 (hardcover).*

A wilderness may be considered a landscape, a series of ecological systems containing more than one community. Landscapes incorporate both terrestrial and aquatic components in spite of the name, and might more easily be defined and identified than the more nebulous ecosystem. At the very least, we are beginning to discuss units of land in an ecological context at levels beyond the plant community, and this broader-scale level is important as we seek to understand the values of wilderness and other wild areas.

This book stems from a symposium at the Sixth International Theriological Congress of 1993 in Sydney, Australia. Seventeen authors provide discussions on the context, field approaches, and "experimental model systems" related to landscape ecological situations dealing with mammals. The chapters generally have conservation applications, and three present views of the evolution of the landscape concept, which might be of most interest to those reading this for wilderness-related informa-

tion. There is a valuable representation of literature from across the continents, which adds value and depth to the discussions. A number of subjects, including corridors between habitat patches, patch sizes, and configuration are discussed throughout the book. The field approaches deal with the Australian tropical rainforest, agricultural and urban landscapes, ecology of martens, and Norway's predator-prey relationships. The model systems include discussions on use of experimental and simulated landscapes in ecology, and old-field habitats.

This book deals primarily with the smaller mammals and concepts applicable to their ecology at different levels up to the landscape level. It is not a comprehensive review of literature that is applicable to understanding landscape-level ecology of mammals. For instance, the extensive literature on caribou movements and habitat use could be reviewed for what retention of landscape-level integrity is needed for this far-ranging species. The griz-

zly bear, a habitat generalist with large home-range size that typically includes many plant communities, must be managed at the landscape level and has special needs relative to security from humans that are important.

In the wilderness context, this book provides information useful in assessing the suitability of areas to support populations of different species and sizes, how populations may respond to different levels of habitats, and for assessing their suitability for retention or re-establishment of intact systems. Many of the concepts and theoretical considerations have definite implications for wilderness management, and thus the book serves those interested in wilderness by providing ecological insights. Although this collection of papers is primarily intended for the mammalian ecologist, it can definitely make a contribution beyond that niche of science by enhancing our understanding of wilderness values. **IJW**

*Reviewed by James M. Peek, professor of wildlife resources at the University of Idaho, Moscow, Idaho.

New National Monument Created in the United States

U.S. President Clinton used his authority under the Antiquities Act of 1906 last September to create the Grand Staircase-Escalante National Monument in Utah. The area includes 1.7 million acres of federal public land in southern Utah. It is the first national monument administered by the U.S. Bureau of Land Management.

The Grand Staircase-Escalante is a high, rugged, and remote region that was the last place in the continental United States to be mapped. It is a valuable geologic area for scientific study and includes the wild canyon country of the upper Paria Canyon system, major components of the White and Vermillion Cliffs, the spectacular Circle Cliffs, and remaining unprotected parts of the Waterpocket Fold.

The monument includes world-class paleontological sites, such as the Circle Cliffs, which contain remarkable specimens of large, unbroken petrified logs exceeding 30 feet in length. It is a haven for archeologists studying ancient Native American cultures, and it contains hundreds of recorded archeological treasures, including art panels, occupation sites, campsites, and granaries. Scientists say that there are many more undocumented sites in the area still to be studied.

The monument spans five life zones from low desert to coniferous forest and harbors numerous wild species that live in those habitats. Significant populations of mountain lion and desert bighorn sheep share the area with more than 200 species of birds, including bald eagles and peregrine falcons. Lots of wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.

National monument status will not affect recreational use of the area but will prevent coal mining, which is a threat to some of the antiquities.

(Excerpted from *Outdoor News Bulletin*, Vol. 50, No. 9, September 1996.)

HENRY *continued from page 19*

Ford, and Carter and have never been acted upon. They include such well-known places as Yellowstone, Glacier, Grand Teton, Great Smoky Mountains, Zion, Bryce Canyon, and Canyonlands National Parks, among others. Current NPS policy is to "take no action that would diminish the wilderness suitability of an area recommended for wilderness study or for wilderness designation until the legislative process has been completed. Until that process has been completed, management decisions pertaining to recommended wil-

derness and wilderness study areas will be made in expectation of eventual wilderness designation."

Prospects for Wilderness

Wilderness is the highest form of stewardship the NPS can offer. Wilderness designation represents a national affirmation of the importance of the wilderness values of these lands—that they are the very best of the very best. The NPS will work to be a leader in the NWPS. The agency is in many ways already oriented in this direction. Wilderness evokes connections with a large

and powerful literature that can excite the imagination of users. This positive association between parks and wilderness can be used to build stronger ties with groups that support the National Park System. And seeing wilderness in parks as partner of a larger wilderness system should encourage cooperation with other land management agencies administering adjacent wilderness areas. **IJW**

WES HENRY, the national wilderness coordinator for the NPS, works in the Ranger Activities Division in NPS Headquarters. In addition to his wilderness expertise, he is an authority on overflight and noise issues as well as on tourism management in East African wildlife parks.

JEROME *continued from page 22*

ecosystems in support of endangered species' recovery efforts all represent significant challenges for wilderness managers.

Current Allocation Issues

Two million acres on 24 refuges in the lower 48 states and 8.6 million acres on Alaskan refuges have been recommended for wilderness designation by the USFS. Consistent with USFS policy, these areas will be managed to protect their wilderness values until such time as Congress takes action. Additional lands that may be suitable for wilderness designation will be reviewed in conjunction with the preparation of comprehensive management plans.

Prospects for Wilderness

The long-term preservation of wilderness values can only be accomplished in the context of an ecosystem approach with participation from all affected agencies and public interests. Protection of watersheds and maintenance of natural processes that extend beyond wilderness boundaries but affect wilderness resources will require innovative strategies and a spirit of cooperation. **IJW**

PETER JEROME is the national wilderness coordinator for the Fish and Wildlife Service and has worked on national wildlife refuge issues in the field, region, and Washington, D.C., offices.

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Shorebirds on tidal flat at Monomy Island National Wildlife Refuge Wilderness. (Photo courtesy Arthur Carhart National Wilderness Training Center.)

FEATHERSTONE *continued from page 41*

but also internationally. Therefore, we are documenting and publicizing what we are learning. Table 1 shows our main principles of ecological restoration for the pinewoods in Scotland, not a definitive statement for ecological restoration, but a "work in progress" through which we and others involved in this work are learning as we proceed. Nature still has much to teach us. **IJW**

ALAN WATSON FEATHERSTONE is the executive director of Trees for Life and publishes the Trees for Life Calendar and Engagement Diary each year. He lives with his wife and young son at the Findhorn Foundation in northern Scotland. For further information about Trees for Life, please write to: Trees for Life, The Park, Findhorn Bay, Forres IV36 OTZ, Scotland.

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6TH WORLD WILDERNESS CONGRESS

**Bangalore, India
October 1997**

The World Wilderness Congress will convene in Asia for the first time, in the beautiful city of Bangalore, in southern India, in October 1997. In the tradition of the WWC, the 6th Congress is a public forum in which key politicians, scientists, businessmen, religious leaders, indigenous people, artists and entertainers, educators, and many others act upon issues critical to the Asian environment and wildlands in a global context.

FOR INFORMATION AND REGISTRATION

North and South America

The WILD Foundation
International Center for Earth Concerns
2162 Baldwin Road
Ojai, CA 93023 USA
Fax: (805) 649-1757

Europe, Asia, Africa, Pacific

"Hamsini"
12th Cross
Rajmahal
Bangalore 560 080 India
Fax: 91/080-334-1674

