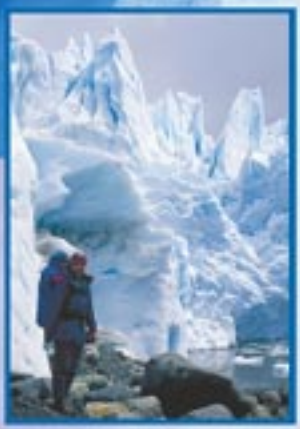
INTERNATIONAL

Journal of Wilderness

In This Issue

- Land Inholdings Within Wilderness
- Debate on Fixed Climbing Anchors in Wilderness
- Spiritual Benefits of Wilderness
- Poland, Indonesia



DECEMBER 2002 VOLUME 8, NUMBER 3

INTERNATIONAL

Journal of Wilderness

DECEMBER 2002 VOLUME 8, NUMBER 3

FEATURES

3 EDITORIAL PERSPECTIVES
Wilderness Benchmarks
BY CHAD P. DAWSON

4 SOUL OF THE WILDERNESS
Sierra Club Reaches "Beyond the Borders"
BY STEPHEN MILLS

STEWARDSHIP

9 *Inholdings within Wilderness*
Legal Foundations, Problems, and Solutions
BY RANDY TANNER

15 *Toward a Resolution of the Fixed Anchors in Wilderness Debate*
BY CHRISTOPHER D. JONES and STEVEN J. HOLLENHORST

21 *State-Designated Wilderness Programs in the United States*
BY CHAD P. DAWSON and PAULINE THORNDIKE

SCIENCE AND RESEARCH

27 PERSPECTIVES FROM THE ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE
International Science Activities
BY DAVID J. PARSONS

EDUCATION AND COMMUNICATION

28 *On the Spiritual Benefits of Wilderness*
BY BAYLOR JOHNSON

INTERNATIONAL PERSPECTIVES

33 *Białowieża Primeval Forest*
The Largest Area of Natural Deciduous Lowland Forest in Europe
BY ANDRZEJ BOBIEC

38 *Livelihood Security and Protected Area Management*
BY STEPHEN F. SIEBERT and JILL M. BELSKY

WILDERNESS DIGEST

43 *Announcements and Wilderness Calendar*

47 *Book Reviews*
Return of the Wild: The Future of Our Natural Lands
Edited by Ted Kerasote
REVIEW BY JOHN SHULTIS

47 ***At the Ends of the Earth: A History of the Polar Regions***
By Kieran Mulvaney
REVIEW BY PATRICK MAHER

48 *Guidelines for Contributors*

The front COVER PHOTO peers straight into an ice cave on the Perlito Moreno Glacier in Los Glaciares National Park, Santa Cruz, Argentina. PHOTO INSET is of the Perlito Moreno Glacier with Cornelia and Kevin Featherstone in the the foreground. Both photos © 2001 courtesy of Alan Watson/Forest Light.

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.

International Journal of Wilderness (IJW) publishes three issues per year (April, August, and December). *IJW* is a not-for-profit publication.

Manuscripts to: Chad P. Dawson, SUNY-ESF, 211 Marshall Hall, One Forestry Drive, Syracuse, N.Y. 13210-2787, USA. Telephone: (315) 470-6567. Fax: (315) 470-6956. E-mail: cpdawson@esf.edu.

Business Management and Subscriptions: WILD Foundation, P.O. Box 1380, Ojai, CA 93024, USA. Fax: (805) 640-0230. E-mail: info@wild.org.

Subscription rates (per volume calendar year): Subscription costs are in U.S. dollars only—$35 for individuals and $55 for organizations/libraries. Subscriptions from Canada and Mexico, add $10; outside North America, add $20. Back issues are available for $15.

ISSN # 1086-5519.

Submissions: Contributions pertinent to wilderness worldwide are solicited, including articles on wilderness planning, management, and allocation strategies; wilderness education, including descriptions of key programs using wilderness for personal growth, therapy, and environmental education; wilderness-related science and research from all disciplines addressing physical, biological, and social aspects of wilderness; and international perspectives describing wilderness worldwide. Articles, commentaries, letters to the editor, photos, book reviews, announcements, and information for the wilderness digest are encouraged. A complete list of manuscript submission guidelines is available from the managing editor.

Artwork: Submission of artwork and photographs with captions are encouraged. Photo credits will appear in a byline; artwork may be signed by the author.

World Wide Website: www.ijw.org.

Printed on recycled paper.

SPONSORING ORGANIZATIONS

• Aldo Leopold Wilderness Research Institute • Indiana University, Department of Recreation and Park Administration • National Outdoor Leadership School (NOLS) • Outward Bound™ • SUNY College of Environmental Science and Forestry • The WILD® Foundation • The Wilderness Society • University of Idaho Wilderness Research Center • University of Montana, School of Forestry and Wilderness Institute • USDA Forest Service • USDI Bureau of Land Management • USDI Fish and Wildlife Service • USDI National Park Service • Wilderness Foundation (South Africa) • Wilderness Inquiry • Wilderness Leadership School (South Africa)

EDITORIAL PERSPECTIVES

Wilderness Benchmarks

BY CHAD P. DAWSON

"I am glad I shall never be young without wild country to be young in.
Of what avail are forty freedoms without a blank spot on the map?"
—**Aldo Leopold**, ***A Sand County Almanac***

At the start of the fall semester, Beloit College in Wisconsin distributes a reminder to college faculty about the mindset of the incoming freshmen, based on the year these new students were born (www.beloit.edu). The concept is that these 18 year olds see the world differently from those of us who have the benefit of having lived through the history they will only read about. The 2002 listing notes that freshman born in 1984 would have grown up with the view that genetic testing and DNA screening have always been available, that cyberspace has always existed, and that scientists have always recognized the impact of acid rain.

What about the mindset of new generations of young adults all over the world and their benchmark, or reference point, for wilderness? Some have grown up with a concept of wild areas, wild country, and wilderness formed from what they see on TV, in movies, or what they hear in sound bites on the evening news. For better or worse, youth will see wilderness in the cultural context in which they were raised. Some urban youth in the United States probably think of wilderness as a sport utility vehicle due to mass marketing and advertisements for vehicles with such names. Some youth who wear today's fashions have no idea that some of their clothes or accessories (e.g., carabiners, daypacks) were based on innovations in recreation equipment, especially for the needs of travelers in backcountry and wilderness environments. Rural youth in communities around the world may view wilderness as their "backyard," or the place where they hunt or collect vegetation for food, shelter, and to sell. Hopefully, many will have heard about wilderness in a positive way and believe that it has always been valued and protected by societies around the world.

In this issue, Stephen Mills reports on expanding international programs by the Sierra Club to educate, and involve South African and Mexican communities in environmental protection. Involving local communities is one way to create a long-term impact on how they value and sustain wildlife populations, protected areas, and wilderness. Often, nongovernmental organizations, such as the Sierra Club and its partners, can more directly address the connection between cultures and the environment than can governmental agencies. One of the Sierra Club's strengths is in helping to create grassroots organizations and assist social innovators who want to make their own communities sustainable in their environmental setting.

Article author Chad P. Dawson.

Two articles, each about very different places in the world, explore the challenges and opportunities that face communities as they struggle with sustaining both community and the environmental quality of protected areas. Stephen F. Siebert and Jill M. Belsky report on their longitudinal study of an Indonesian village, and the villagers' varied attempts at securing a livelihood from the land during a changing relationship with an area designated as a National Park. Andrzej Bobiec outlines the historical and current context of sustainable use and preservation within one of the last remaining lowland forest areas in Europe.

This issue of *IJW* includes several articles about stewardship of wilderness conditions and user experiences in the United States. Randy Tanner outlines the legal situation regarding parcels of private and state-owned land within

Continued on page 8

SOUL OF THE WILDERNESS

Sierra Club Reaches "Beyond the Borders"

BY STEPHEN MILLS

"When we try to pick out anything by itself, we find it hitched to everything else in the Universe."
—**John Muir,** ***My First Summer in the Sierra***

In keeping with the spirit of founding father John Muir, the Sierra Club recently announced an extraordinary expansion of the 110-year-old organization's international program. Not content with ongoing international programs that are educating Sierra Club members about trade policy, population growth, and the links between human rights and the environment, the nation's largest grassroots environmental organization—which now has more than 750,000 members throughout the United States—can now proudly boast that it is also helping to support wildlife and wilderness protection across southern Africa. This new grant-making program, called Beyond the Borders, also supports environmental organizing efforts in Mexico.

A long-held Sierra Club tenet is that the environment can never truly be protected unless local communities are involved in the process of building public support and holding governments—and these days, businesses—accountable. Over the years, the Sierra Club has encouraged such involvement by defending, supporting, engaging, and inspiring communities to take action. Beyond the Borders aims to spread this philosophy to regions that are fairly new territory for the organization.

Article author Stephen Mills, is the director of the Sierra Club's International Program, based in Washington, D.C.

Southern Africa

In South Africa, Namibia, Mozambique, and Angola, the Sierra Club's Beyond the Borders' African Wildlife Protection Grants Program, a collaborative effort with The WILD Foundation, will help communities protect wildlife and wildlife habitat. Healthy wildlife populations can mean more tourism in an area, and this in turn creates jobs for local workers. A more sustainable workforce, program organizers expect, will improve working conditions, help ease poverty in the region, and help educate local people and decision makers about the importance of their wildlands and wildlife.

To implement its grant-making program in Africa, the Sierra Club chose to work with The WILD Foundation. As regular readers of the *IJW* are aware, WILD works to protect and sustain critical wild areas, wilderness values, and endangered wildlife throughout the world, with a special emphasis in southern Africa, by initiating or facilitating practical field projects, environmental education, and experiential programs. The Sierra Club chose The WILD Foundation because it has a solid reputation for working effectively with local communities and because of its commitment to southern Africa. WILD already had an extensive regional network of professional associates and contacts and had worked on or actively supported projects in each of the 10 countries in the region. In keeping with the Sierra Club's tradition of involving local communities with environmental protection, WILD's hands-on projects help create long-term solutions that protect and sustain wilderness and wildlife while meeting the needs of indigenous cultures.

In 2002, the Sierra Club Foundation distributed $150,000 to The WILD Foundation for

- specialized training of a group of African park wardens and rangers;
- citizen advocacy and nongovernmental organization (NGO) training;
- work with the Kissama Foundation in Angola for the reintroduction of elephants, training local game guards, and capacity building;
- work with the Cheetah Conservation Fund in Namibia for cheetah conservation, particularly integrated with scientific research, conservation biology, and rural education; and
- a small grants fund to foster NGO capacity and responsiveness.

African and international training group at the 7th World Wilderness Congress wilderness managers training course in Port Elizabeth, South Africa. Photo by Vance Martin.

While one of the core purposes of the Beyond The Borders Southern African program with the WILD Foundation centers on the protection of endangered wildlife (e.g., work in Angola with translocating elephants; cheetah conservation in Namibia), the Sierra Club clearly understands that this goal is most effectively achieved by a broad-based program that focuses on the needs of human communities in relationship to the endangered wildlife. For example, a significant part of the program in South Africa has been conducted through WILD's sister organization, the Wilderness Foundation (South Africa), and deals specifically with developing a network of citizen advocacy and involvement with each of the major wilderness areas in the country. While this effort is already working in each of the 10 wilderness areas, the particular focus is on the Baviaanskloof (Baboon's Ridge) wilderness area in the Eastern Cape.

The Cape province contains five of the world's seven floristic kingdoms, and the Baviaanskloof area in particular supplies 90% of the water for the entire Eastern Cape region. The area is a matrix of interests, including government land, private farms, and indigenous communities that are often at odds with each other. Sierra Club's efforts there with WILD and the Wilderness Foundation are helping to facilitate a long-term resolution between these conflicting interests, and the eventual full and final designation of the Baviaanskloof as the newest and largest wilderness area in South Africa.

Another project in South Africa was visited by the Sierra Club's Michelle Perault (vice president, International) and Stephen Mills (director, International Programs) to better understand how WILD is working with other organizations in very rural Kwazulu Natal on the concept of a "community conservation area." Such a protected area may eventually be proclaimed on tribal land, amongst adjacent tribal districts, creating ecotourism and other local benefits. A great deal of effort is needed at these early stages of a project, such as facilitating communication between conflicting tribal interests, clarifying local perceptions, providing education and training, and long-term planning. The entire process takes a lot of time.

Finally, the hard work of conservation NGOs, who are at the forefront of local and regional wildlife and wildland issues, are greatly enhanced by grants that address small but critical equipment needs, additional skilled people, and minimal travel funds to meet with other groups. The Sierra Club and WILD are addressing these needs in a wide variety of ways, including supplying digital cameras, a sail–powered patrol boat for a coastal national park in Mozambique, and administrative assistance for the Bateleurs, a group of private pilots who loan their skills on behalf of conservation causes and issues.

The Mexico Project

It was February of 2001 when the Sierra Club's board of directors met in Brownsville, Texas—located on the U.S. border with Mexico—and Matamoros,

Beyond the Borders coordinator Alejandro Queral, on the U.S.–Mexico border, at work with local communities. Photo courtesy of the Sierra Club.

Tamaulipas located on the Mexican border with the United States—and volunteer leaders first had the opportunity to learn directly about the environmental and health problems associated with the rapid industrialization of the border region. Seeing the problems firsthand and talking with local residents and activists gave the board a sense of the complexity of the problems and the need to collaborate with community groups and grassroots organizations already working on these issues. It effectively put a human face on globalization.

In fact, it was this meeting that spurred the creation of the multiyear project to support Mexican grassroots environmental and community organizations in their fight for environmental justice. The Mexico Project supports grassroots groups in Mexico financially through grants and organizationally through the efforts of a "border organizer," whose goal is to focus on the needs of communities on both sides of the border. Considering the years of pollution resulting from unregulated expansion of the maquiladora (foreign-owned assembly plants in Mexico) industry coupled with extraordinary population growth, it's no small job.

The Border representative is currently coordinating the gathering of relevant scientific and legal information and maintaining a database of resources available to partner groups. For example, Sierra Club volunteers are developing a database with doctors, scientists, lawyers, and other experts that should enable them to share their knowledge to interpret data and legislation or give general advice to NGOs and communities.

A Sierra Club/Sierra Club Foundation partnership, the Mexico Project is designed not only to support and strengthen grassroots environmental and community groups, it also aims to educate Sierra Club members about Mexican environment and environmental justice issues, and to involve Sierra Club volunteers in supporting Mexican environmental activism. Outreach efforts will include a mix of organizing support and training, and will be matched by a grant-making program for small community groups that have often been overlooked by other large foundations. In order to support these efforts, the Sierra Club set up a parallel program to make small grants to both Mexican community organizations as well as to Sierra Club groups with collaborative projects along the border.

The Mexico Project is the Sierra Club's first truly binational program designed to provide organizational (e.g., capacity building, campaign planning, etc.) and financial support to grassroots environmental organizations in Mexico, while at the same time promoting increased cooperation among groups in Mexico and in the United States fighting for a clean and healthy environment. The potential for success is great, although there are many challenges of astounding proportions, such as the more than 2,000-mile-long border between the United States and Mexico, the lack of education and understanding about the current model of economic growth, and the geopolitical boundary—a reminder of the significant cultural, political, and economic differences between the two countries. For example, the Sierra Club's border representative, Alejandro Queral, has identified more than 20 grassroots groups in Mexico that have requested some form of support—whether organizational or financial—in order to work on specific campaigns or projects.

The Sierra Club's improved understanding that the communities and groups representing them can define their needs and determine the solutions has paved the way for new relationships. This understanding sometimes means that the organizer engages in a lengthy process of identifying problems and then works with community leaders to identify potential solutions. Partly in response to this experience, Queral is currently working with grassroots organizers in Mexico to adapt the Sierra Club's campaign planning matrix and its *Grassroots Organizing Manual,* and to make them politically and culturally relevant to activists in Mexico.

A long-held Sierra Club tenet is that the environment can never truly be protected unless local communities are involved … .

Ashoka: Innovators for the Public

In addition to funding community groups in Africa and Mexico, the Sierra Club's Beyond the Borders program has contributed to fellowships through

Ashoka: Innovators for the Public, which supports social entrepreneurs who work to help communities become more sustainable. Around the world, Ashoka has launched over 250 social entrepreneurs working to improve the economic, social, and environmental outcomes for the communities in which they work. This cluster of environmental Ashoka Fellows is developing a diverse array of innovative yet practical solutions. Maintaining a regional focus, the Sierra Club has chosen to support Ashoka Fellowships in southern Africa and Mexico.

Ashoka Fellow Allan Schwar in Mozambique and South Africa

In a region that suffers from both dire poverty and extensive forest loss, Allan is conserving forests by investing in, developing, and managing the resources in a sustainable way for the benefit of all the forest inhabitants. He uses a business model that focuses on creating alternative forest-friendly income-generating activities. Allan works with the people who live on forestland to take inventory of the resources and create a forest management plan that balances timber harvesting with replanting. He employs workers and trains them in sustainable, on-site, value-added production activities that generate income while contributing to forest conservation.

Allan's project produces commercially viable honey, beeswax, timber, furniture, jewelry boxes, and other wood products. Local and international businesses and organizations commission, buy, and market many of these products. For example, the project produces jewelry and jewelry boxes for Earth Africa, a South African company, and has recently provided chairs for a local restaurant. The organization Aid to Artisans also markets some of the goods in the United States. In addition, Allan's company is the first local contractor to be awarded a contract to produce doors and windows for a new rural clinic. Allan has proved to buyers that local cooperatives can produce quality goods on time. The income of the cooperative's artisans has increased from an average of $14 a month to $92 a month in the two years that Allan has been working with them. Although the forest communities still mainly supply raw material to the urban cooperative that produces the consumer goods, Allan intends to eventually have the forest communities producing consumer-ready products on-site.

Allan achieves these advances in economic opportunity while preserving forests and developing environmentally sustainable forest communities. In addition to ensuring that trees are replanted and forest resources managed effectively within the communities where he works, Allan's company has been contracted to build tree nurseries, train timber company staff, and advise various aid organizations and local NGOs on community-based resource management and environmental impact analysis. Two years ago, Mozambique had only two indigenous species nurseries, both operated by Allan's company. Due to Allan's negotiating and advising, there are now six of these nurseries. To date, Allan's nurseries alone have germinated over 100,000 indigenous trees.

Allan has had a significant impact on environmental policy in Mozambique's Sofala province. Through his advising and lobbying, the provincial government has placed a moratorium on the export of logs. Only timber to which value has been added can be exported. Because of this restriction, buyer countries must purchase products processed locally, allowing lower impact technologies and lighter taxation of infrastructure and thus ensuring that a reasonable share of the commodity price remains in the community.

Zululand hills of rural KwaZulu Natal, South Africa. One of the numerous areas in which the Sierra Club and the WILD Foundation are collaborating. Photo by Vance Martin.

Ashoka Fellow Heladio Reyes in Mexico

Heladio's organization, *Ecosta Yutu Cuii*, or Green Trees from State to Coast, provides training and implementation strategies on a wide range of agricultural issues, including crop management, forestry, organic production, wildlife preservation, and biological pest control. In addition, Heladio has expanded his work to reflect the vital social issues of financial management, natural medicine, and nutrition.

Heladio's program has been implemented throughout the Río Verde de Tutuepec region in Oaxaca, Mexico. The program involves more than 15 communities and 150 poor landowners. It combines different traditional and alternative techniques for the preservation of endangered species and agricultural programs that enable indigenous populations to grow food for themselves.

Traditional woman in rural KwaZulu Natal. Photo by Vance Martin.

The Sierra Club's improved understanding that the communities and groups representing them can define their needs and determine the solutions has paved the way for new relationships.

Heladio has developed natural pesticides derived from local plants and has also established a laboratory to harvest insects for pest control purposes.

The *Ecosta Yutu Cuii* initiative encourages members of poor communities around Mexico to actively work toward the preservation of 15,000 acres (6,000 ha.) of land. The training programs include forest fire prevention and reduction of the domestic use of wood resources. Heladio's idea differs from existing programs in that it involves underserved indigenous community members in social programs, agricultural technology, forest preservation strategy, and natural resource conservation.

Heladio organized and conducted last year's Environmental Festival in Oaxaca, Mexico, which drew about 700 participants from around the country. Themes of the event included fauna conservation, natural foods, herbal remedies, forestation, and agricultural products. As a result of the Environmental Festival and other activities over the past year, Heladio established formal relationships with numerous organizations, such as the Kellogg Foundation, the Mexican Natural Conservation Fund, the Autonomous University of Chapingo, and the National Agro-Ichthyological Technology Center of Pinotepa. With continued support, *Ecosta Yutu Cuii* will continue to develop its new credit and savings project, which currently includes 180 members and a $200,000 endowment, to support education, care for the infirm, housing, and travel.

STEPHEN MILLS is director of the International Program for the Sierra Club in Washington, D.C. E-mail: stephen.mills@sierraclub.org.

From EDITORIAL PERSPECTIVES on page 3

wilderness boundaries. Christopher Jones and Steven J. Hollenhorst present chronologically the controversy over climbers using fixed-anchors in wilderness. Pauline Thorndike and I summarize what is known about state designated wilderness within the United States. Six spiritual benefits of wilderness experiences are presented by Baylor Johnson, who suggests in his essay how we are psychologically nurtured from this experience.

The benchmark and the connection with wilderness we leave for the next generation around the world include both the protected land areas called wilderness and our attitude and ethic about the value of wildness in the environment and within ourselves.

CHAD P. DAWSON is managing editor of *IJW*. E-mail: cpdawson@esf.edu.

From ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE on page 27

- Membership in the International Union for the Conservation of Nature and Natural Resources (IUCN's) World Commission on Protected Areas; efforts to include wilderness in the agenda of the 2003 World Protected Areas Conference.

Exposure to the variety of approaches and attitudes toward the understanding and management of wilderness, parks, and similarly protected wildlands that has come with our increased international activity has provided ALWRI scientists with new insights into ways to approach and apply science to the many challenges facing wilderness managers, both in the United States and in other countries. Collaboration with scientists and managers across the world has become an increasingly valued tool in the institute's toolbox. It is clear that international collaboration is now critical to the effective stewardship of natural areas across the globe.

DAVID J. PARSONS is Director of the Aldo Leopold Wilderness Research Institute, P.O. Box 8089, Missoula, MT 59807 USA. E-mail: djparsons@fs.fed.us.

Inholdings within Wilderness

Legal Foundations, Problems, and Solutions

BY RANDY TANNER

For many people, the wilderness ideal is a vast and contiguous tract of unspoiled wild land. However, unknown to many is the fact that well over one million acres (404,700 ha.) and thousands of parcels of private or state-owned lands may be contained within U.S. designated wildernesses. These lands, termed *wilderness inholdings*, present challenges to wilderness advocates that require creative solutions and deliberate action due to serious concern about motorized access to inholdings, land speculation and threatened development, use of inholdings that are incompatible with wilderness, legal ambiguities of ownership rights, and multiple legal guidelines for wilderness managers.

In the western United States, land inholdings in wilderness are largely a result of five legislative acts: The 1872 Mining Law (17 Stat. 91), the 1862 Homestead Act (12 Stat. 392), the 1864 and 1870 Land Grant Acts (12 Stat. 503 and 26 Stat. 417), and the Alaska Native Claims and Settlement Act (ANCSA) (P.L. 92-203). Under the first four Acts, public lands were distributed to the private sector and states to advance westward expansion and development of the land; ANCSA distributed public lands to Alaskan Natives as a land settlement. Many inholdings in wilderness areas are quite large. Under the 1872 Mining Law, parcels were claimed in units of 20 acres (8 ha.), and 160 acres (64 ha.) were turned over to individuals under the Homestead Act. While these four acts distributed land to private individuals, the Land Grant Acts distributed land to States in 640-acre (259 ha.) parcels. ANCSA awarded a total land grant of 44 million acres (18 million ha.) to Alaskan Natives for renouncing all claims to the rest of the state (Zaslowsky 1986). The result on the landscape was a patchwork of private and state-owned land scattered across public lands.

In contrast with the western United States much of the land in the eastern part of the country was privately owned before public lands were established by the U.S. government. When the federal government decided to establish public lands in the eastern United States, it was difficult to do so without some private or state-owned lands being contained within them.

Article author Randy Tanner.

Thus, wildernesses throughout the United States were often established containing inholdings: it would have severely limited the National Wilderness Preservation System (NWPS) to have excluded such areas. Table 1 lists the acres of private and state land inholdings contained within designated wildernesses administered by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and National Park Service (NPS). Data on the acreage of inholdings within U.S. Fish and Wildlife Service (USFWS) wilderness areas is not available.

Problems Associated with Wilderness Inholdings

Inholdings present wilderness advocates and federal agencies with a number of problems, and these can be summarized into five main categories: motorized access across wilderness to inholdings, land speculation and threatened development of inholdings, use of inholdings that are incompatible with wilderness, legal ambiguities related to the property rights of inholding landowners, and multiple legal guidelines for wilderness managers.

Table 1—Acres of Privately Owned and State-Owned Land Inholdings in Wilderness Areas Managed by Federal Agencies.

Federal Agency	Privately Owned Acreage	State-Owned Acreage
U.S. Forest Service	132,603 (53,667 ha.)	305,453 (123,616 ha.)
Bureau of Land Management	311,554 (126,086 ha.)	267,653 (108,319 ha.)
National Park Service	2,462 (996 ha.)	15,208 (6,155 ha.)
U.S. Fish and Wildlife Service	not available	not available

Source: Information provided by federal agencies to Wilderness Watch under Freedom of Information Act requests.

Motorized Access to Inholdings

The use of motor vehicles on wildlands was a serious concern in the early wilderness movement and is one activity The Wilderness Act (TWA) (P.L. 88-577) tried to guard against. Increasingly, agencies are granting motorized access through wilderness to inholdings based more on landowner convenience rather than the adequacy of nonmotorized access for the inholder. Thus, there is an increasing amount of motor vehicle traffic within the NWPS lands. In some cases, motorized access through wilderness has been allowed when travel by foot or horse would be adequate for reasonable use of the property by the inholder. In addition to impacts upon the biophysical characteristics of wilderness, motorized intrusions are damaging to the wilderness experiences of users. For example, an inholder in Oregon's Kalmiopsis Wilderness has requested motorized access to log, mine, and develop his inholding. During the process of evaluating the developmental potential of his land, the inholder, accompanied by surveyors and appraisers, repeatedly drove his jeep across the Kalmiopsis Wilderness to access his property (see Figure 1). Not only did he inflict severe damage to the land and the character of the wilderness, but it is also possible that he spread (via the mud tracked in on his tires) a fungus, found along 70% of the access route, that preys on Port Orford cedar (*Siskiyou Regional Education Project and Wilderness Watch* v. *U.S. Forest Service,* suit filed in 1998). While the USFS has not yet granted motorized access, should it be granted, severe damage to the land, native species, and wilderness character would occur.

Figure 1—A hiker walks along a road used to access an inholding in the Kalmiopsis Wilderness, Oregon. Photo courtesy of *High Country News.*

Land Speculation and Threatened Development of Inholdings

Land speculation and *development* are not words typically associated with wilderness, but some inholders have recently begun to employ such practices to make a large profit off of their land by threatening to develop or sell its property. For example, an inholder in the West Elk Wilderness of Colorado transported materials via helicopter to his inholding and then began construction of a 3,450-square-foot house in the heart of the wilderness (Figure 2). He threatened further development on his inholding unless the USFS either paid a large sum of money for the property or offered a lucrative land exchange. To prevent incompatible development within the West Elk Wilderness, the USFS exchanged a 105-acre (42-ha.) plot near Telluride, Colorado, worth $4.2 million for the 240-acre (97-ha.) inholding worth an estimated $240,000 (Clifford 2000). Unfortunately, this is not an isolated case; more "opportunistic" individuals have and are attempting the same extortive actions.

Incompatible Use of Inholdings

Designated wildernesses are the most protected public lands in the United States. Incompatible use of inholdings can impact the ecological health, the aesthetic value, and the character of the adjoining wilderness. Incompatible uses can include major building construction, airfield use, mining, and introduction of exotic species (e.g., fish stocking). For example, in 1999 an inholder in Montana's Absorka-Beartooth Wilderness, who acquired his inholding through a patented mining claim, stated that if the USFS did not buy the mining rights to his inholding, he would take advantage of the mineral deposits and mine it himself. After the USFS refused to purchase the mining rights, the inholder then requested an 8.6-mile road be built through the wilderness to his inholding, which would enable him to transport the minerals from his property. The USFS's decision to deny such a proposal was upheld in federal

district court. However, the inholder has recently proposed to make several low-flight helicopter trips to transport the minerals from his property—an obviously disturbing impact to the quality of the Absorka-Beartooth Wilderness.

Legal Ambiguities Related to the Property Rights of Inholding Landowners

Access to wilderness inholdings is subject to the restrictions imposed by TWA and the legislation that designated that particular wilderness. In the absence of any other legislation relevant to a particular wilderness, section 5(a) of TWA serves as the legal basis regarding land inholdings contained within a wilderness. TWA directs agencies to offer adequate access or an exchange of lands. Subsequent wilderness legislation relevant to inholdings sometimes only included provisions to grant adequate access (not necessarily motorized) if it is requested, but the legislation does not preclude the agencies from offering a land exchange. In addition to TWA, the most important pieces of wilderness legislation relevant to land inholdings are the Eastern Wilderness Act (EWA) (P.L. 93-622), Alaska National Interest Lands Conservation Act (ANILCA) (P.L. 96-487), and California Desert Protection Act (CDPA) (P.L. 104-433), which are listed in Table 2, along with key legal provisions related to inholdings.

While all four federal agencies managing wilderness under the NWPS are bound by TWA and other relevant legislation, agencies promulgate their own regulations or policies that serve as the agencies' interpretation of those laws. While both regulations and policies serve as the foundation for the agencies' management of wilderness, regulations are legally binding, whereas policies are only administrative guidelines. However, should a legal issue be brought before the courts and there is found to be a conflict between the legislation and agency regulations or policies, the legislation has precedence over the regulations or policies of the agencies. Table 3 lists the federal agency regulations and policies concerning wilderness inholdings.

Wilderness legislation, regarding inholdings, contains inconsistent language that has led to multiple interpretations by federal agencies. These varied interpretations have caused difficulties both in determining the type of access to be permitted to inholdings and the intended scope of some legislation. Two

Figure 2—Workers construct an inholder's cabin, which is visible for several miles throughout the West Elk Wilderness, Colorado. Photo courtesy of The Wilderness Land Trust.

Table 2—U.S. Legislation Concerning Privately Owned and State-Owned Land Inholdings in NWPS Wilderness Areas.

Legislation (Public Law and Section Number)	Statutory Language
The Wilderness Act (P.L. 88-577 § 5[a])	" In any case where State-owned or privately owned land is completely surrounded by national forest lands within areas designated by this Act as Wilderness such State or private owner shall be given such rights as may be necessary to assure adequate access to such State-owned or privately owned land by such State or private owner and their successors in interest, or the State or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value…"
The Eastern Wilderness Act (P.L. 93-622 § 6 [b] [3])	"The Secretary of Agriculture may acquire such land or interest without consent of the owner or owners whenever he finds such use to be incompatible with the management of such area as wilderness and the owner or owners manifest unwillingness, and subsequently fail, to promptly discontinue such incompatible use."
The Alaska National Interest Lands Conservation Act (P.L. 96-487 § 1110 [b])	"The State or private owner shall be given by the Secretary … adequate and feasible access for economic and other purposes … subject to reasonable regulations issued by the Secretary to protect the natural and other values of such lands."
The Alaska National Interest Lands Conservation Act (P.L. 96-487 § 1323)	(a) "… the Secretary of Agriculture … shall grant access to non-federally owned land within the boundaries of the National Forest System as the Secretary deems adequate to secure to the owner the reasonable use and enjoyment thereof…" (b) "…the Secretary of the Interior … shall provide such access to non-federally owned lands surrounded by public lands managed by the Secretary under the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701-82) as the Secretary deems adequate to secure to the owner the reasonable use and enjoyment thereof …"
The California Desert Protection Act (P.L. 104-433 § 708)	"the Secretary shall provide adequate access … which will provide the owner of such land or interest the reasonable use and enjoyment thereof."

pieces of legislation at the center of this controversy are TWA and ANILCA.

Section 5(a) of TWA directs agencies to provide adequate access or offer a land exchange for the inholding. This section of the legislation has been interpreted a couple of different ways. Some have implied that the appropriate federal agency must, if an exchange offer is not acceptable to the property owner, make adequate access available. Conversely, if the property owner does not see the granted access as adequate, then an offer for exchange must be made. However, a 1980 U.S. attorney general opinion interpreted the section to mean that the appropriate federal agency has the option of choosing either an exchange or granting access to the inholding, and once one of the two offers has been made, the agency has satisfied its responsibility (Civiletti 1980). Also, as section 5(a) states, regardless of which option is chosen, the action is subject to the preservation of wilderness character

Table 3—Agency Regulations and Policies Concerning Privately Owned and State-Owned Land Inholdings in Wilderness Areas.

Federal Agency Regulation or Policy	Regulation or Policy Language
Bureau of Land Management (43 CFR 6305.10)	"If you own land completely surrounded by wilderness, BLM will only approve that combination of routes and modes of travel to your land that—(1) BLM finds existed on the date Congress designated the area surrounding the inholding as wilderness, and (2) BLM determines will serve the reasonable purposes for which the non-Federal lands are held or used and cause the least impact on wilderness character."
U.S. Fish and Wildlife Service (50 CFR 35.13)	"Rights of States or persons and their successors in interest, whose land is surrounded by a wilderness unit, will be recognized to assure adequate access to that land. Adequate access is defined as the combination of modes and routes of travel which will best preserve the wilderness character of the landscape. Mode of travel designated shall be reasonable and consistent with accepted, conventional, contemporary modes of travel in said vicinity. Use will be consistent with reasonable purposes for which such land is held."
U.S. Forest Service (36 CFR 251.110 [c])	"… as appropriate, landowners shall be authorized such access as the authorized officer deems to be adequate to secure them the reasonable use and enjoyment of their land."
National Park Service (Director's Order #53 §10.4)	"Except as specifically provided by law, there will be no permanent road, structure or installation within any study, proposed, recommended, or designated wilderness area. This includes the installation of utilities. (See the Wilderness Act *16 USC 23*). The NPS will not issue any new right-of-way permits or widen or lengthen any existing rights-of-way in study, proposed, recommended, or designated wilderness areas." (At present, NPS policies target only right-of-ways to wilderness inholdings.)
Department of Interior (USFWS, NPS, & BLM) Regulations for Wilderness inholdings in Alaska (43 CFR 36.10)	(a) This section sets forth the procedures to provide adequate and feasible access to inholdings within areas in accordance with section 1110(b) of ANILCA. As used in this section, the term: (1) Adequate and feasible access means a route and method of access that is shown to be reasonably necessary and economically practicable but not necessarily the least costly alternative for achieving the use and development by the applicant on the applicant's nonfederal land or occupancy interest.

ANILCA is one of the most important pieces of wilderness legislation since TWA of 1964. After a decade of legislative debate, more than 104 million acres (42 million ha.) of federal lands in Alaska were preserved as national parks, wildlife refuges, and conservation areas, and 56.5 million acres (22.9 million ha.) of those lands were designated as wilderness (The Wilderness Society 2001). Just as important as the designation of protected areas, the ANILCA specified management directives for all 224 million acres (91 million ha.) of federal land in Alaska.

Two sections of ANILCA are particularly relevant to wilderness inholdings—Section 1110 and Section 1323. Subsection 1110(b) specifically addresses access to wilderness inholdings in Alaska, regardless of the managing federal agency and declares that "adequate and feasible access for economic and other purposes" shall be provided "subject to reasonable regulations issued by the Secretary to protect the natural and other values of such lands." Since approximately half of our nation's designated wilderness is in Alaska, including the majority of National Park and Wildlife Refuge Wilderness, 1110(b) is an exceptionally important subsection of law.

Section 1323(a) directs the secretary of agriculture to provide adequate access to land inholdings located within the national forest system that will secure the owner the reasonable use and enjoyment of the inholding. The USFS has interpreted Section 1323(a) to apply to wilderness nationwide, including Alaska, and consequently, they have adopted it as their policy governing access to wilderness inholdings. However, Subsection 1110(b) applies to all designated wildernesses in Alaska, including national forest wilderness; therefore, current USFS policies regarding access to wilderness inholdings should be in accordance with Subsection 1110(b) in Alaska.

There is a parallel controversy with Subsection 1323(b) that directs the secretary of the interior to provide access to "public lands managed by the Secretary under the Federal Land Policy and Management Act of 1976" (FLPMA) (P.L. 94-579) that will secure to the owner the reasonable use and enjoyment of the inholding. FLPMA dealt exclusively with management direction for all BLM lands in the United States, and the BLM has determined that Subsection 1323(b) has nationwide scope. However, ANILCA clearly states that when the phrase "public lands" is used within ANILCA, it is defined as public lands in Alaska and suggests that Subsection 1323(b) should be applied to inholdings in BLM managed lands in Alaska. While some BLM lands are being reviewed for wilderness designation, there are currently no BLM-administered wildernesses within Alaska. For a detailed discussion of the controversies surrounding Section 1323, see *Montana Wilderness Association* v. *USFS, 1981* and Interior Board of Land Appeal, 83-356, 1984.

Not only is clarification needed for the application of ANILCA to wilderness inholdings, but definitions are also needed for the type of access to be allowed. Under ANILCA, inholders will be granted "… adequate and feasible access for economic and other purposes …" of the inholding. Similar language can also be found within TWA and CDPA. Such descriptive language becomes a legal problem since *adequate, feasible,* and *economic purposes* are not defined. Disparate interpretations of *adequate, feasible,* and *economic* exist among wilderness managers, and that can lead to inconsistent management of wildernesses. For example, in a BLM-administered wilderness, motorized access may be deemed adequate, whereas in a similar situation in a USFS-administered wilderness, only horseback or foot travel may be allowed.

Figure 3—Tent frames and leftover trash found on an inholding in the Arctic National Wildlife Refuge, Alaska. Photo courtesy of U.S. Fish and Wildlife Service

Multiple Guidelines for Wilderness Managers

The variety of legislation relevant to wilderness inholdings has created some confusion as to which is applicable for a particular wilderness. Since there are numerous pieces of wilderness legislation, and some legislation regarding access to wilderness inholdings may not be applicable to all agencies managing wilderness, access is often regulated differently depending on which agency administers a particular wilderness. Different directives for access to wilderness inholdings are found not only interagency, but also intraagency. For a particular agency, the permitted access to wilderness inholdings in Alaska under ANILCA may be substantially different from wilderness inholdings in the lower 48 states, where a wilderness is managed by the same agency.

Solutions to Problems with Wilderness Inholdings

Some possible solutions include clarifying and strengthening wilderness legislation and agency regulations regarding wilderness inholdings, supporting land trusts, and, in extreme cases, allowing condemnation of lands. Combining creative solutions with public support ideally will result in a resolution of the dilemmas encountered when wildernesses contain public and state land inholdings.

"… over one million acres and thousands of parcels of private or state-owned lands may be contained within U.S. designated wildernesses."

"... with a significant number of wildernesses containing inholdings, timely and effective solutions to the problems surrounding wilderness inholdings are needed."

Adherence to Wilderness Legislation and Legal Clarification

While, in most cases, agencies managing designated wilderness are required to grant access (not necessarily motorized access) to inholdings, the access granted is conditional and depends upon the wilderness designation legislation and TWA. Thus, agencies have an opportunity to practice wise stewardship by denying any access that is contrary to fundamental wilderness principles (Figure 3). For example, an inholder in the Absorka-Beartooth Wilderness recently requested that the USFS construct an 8.6-mile road to his inholding and grant motorized access. The USFS denied the request based on the concern for the preservation of the wilderness character. The USFS decision was upheld in a federal district court. We recommend that managers prioritize wilderness protection over the convenience of inholders, and existing legislation will enable them to preserve wilderness character in most cases.

Land Trusts

Ultimately, it may be advantageous for agencies managing wilderness to purchase all private and state land inholdings in order to preserve wilderness character in the designated area. However, such an approach is expensive, and, consequently, agencies are unable to afford to purchase all wilderness inholdings. In the event that an agency is unable to purchase an inholding from a willing seller, land trusts—organizations devoted to acquiring lands for conservation—can purchase the land and hold it in the spirit of wilderness stewardship, or sell the land to the agency when more public funding for land purchases is available. Land trusts have traditionally been an effective tool in combating problems with wilderness inholdings. For example, since its origination in 1992, The Wilderness Land Trust (2002) has acquired 180 private inholdings in 35 designated wildernesses.

Condemnation of Wilderness Inholdings

The Fifth Amendment of the U.S. Constitution allows federal agencies to condemn lands if the lands are for public use. TWA does permit condemnation of lands, but does not grant this authority to federal agencies. Instead, it is stipulated in Section 5(c) of the act that authorization by the U.S. Congress is necessary to condemn lands within wilderness boundaries. With the passage of the EWA, 16 national forest wildernesses were established east of the 100th meridian, and the USFS was authorized to condemn inholdings in these particular wildernesses if its use was found to be incompatible with the protection of the wilderness and the owners were unwilling to discontinue the incompatible use. No inholdings have been condemned under the EWA. While condemnation as a way for managers to solve a problem is a last resort, it may be necessary for the preservation of the wilderness character.

Conclusion

The management of designated wildernesses in the NWPS has often been an arduous and delicate task. As outlined in this article, the five types of problems stemming from wilderness inholdings certainly raise concerns among wilderness managers. For many wildernesses, there is potential for a few inholdings to shape the character of the entire wilderness. Thus, with a significant number of wildernesses containing inholdings, timely and effective solutions to the problems surrounding wilderness inholdings are needed.

REFERENCES

Civiletti, Benjamin R. 1980. Opinion of the Attorney General of the United States. Rights-of-Way Across National Forests. June 23, 1980.

Clifford, Hal. 2000. Bulldozer backmail. *Ski Magazine* (February): 117–121.

Interior Board of Land Appeals. 1984. United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals. IBLA 83-356. March 30, 1984.

Montana Wilderness Association v. *United States Forest Service.* United States Court of Appeals, Ninth Circuit. 1981. No. 80-3374. August 19, 1981.

The Wilderness Land Trust. 2000. Retrieved July 9, 2002, from http://www.wildernesslandtrust.org.

The Wilderness Society. 2001. *Alaska National Interest Lands Conservation Act—A Citizens Guide.* Palmer, Alaska: The Wilderness Society.

Zaslowsky, Dyan. 1986. *These American Lands: Parks, Wilderness, and Public Lands.* Washington D.C.: Island Press.

RANDY TANNER wrote this article in conjunction with research done at Wilderness Watch. Randy is currently a graduate student at the University of Montana. E-mail: rtanner@backpacker.com.

Toward a Resolution of the Fixed Anchors in Wilderness Debate

BY CHRISTOPHER D. JONES and STEVEN J. HOLLENHORST

Introduction

Federal land managers in the United States have been challenged with preserving the character of wilderness according to the guidelines stated within The 1964 Wilderness Act (TWA) (P.L. 88-577). However, competing interpretations of the act, which prescribe how to manage the character of wilderness, have often sparked conflict between wilderness interests. Most recently, the use of fixed climbing anchors in designated wilderness managed by the U.S. Forest Service (USFS) has triggered a national debate surrounding the interpretation of Sections 2(c) and 4(c) of TWA. These sections mandate that characteristics of wilderness should include no "permanent improvements" and "installations" to ensure "the future use and enjoyment as wilderness."

Citing these sections of the act and a stated concern for the visual impacts of fixed- anchors, the USFS has imposed an increasing number of bans and restrictions on their use. The USFS has been supported by proponents of fixed-anchor regulations (e.g., Wilderness Watch and Wild Wilderness), who argue that along with violating TWA, the proliferation of fixed anchors erodes the wildness and uncertainty inherent to wilderness climbing (Nickas 1998). Opponents claim that such policies deny climbers, and possibly other visitor groups, with a historical precedence of wilderness visitation, the "future use and enjoyment as wilderness" so mandated by the act.

The purpose of this article is to provide a chronology of the controversy surrounding fixed-anchor use in wilderness, particularly in national forest wilderness, and to discuss the implications for managers, policy makers, and nonprofit organizations in resolving this controversial issue.

What Are Fixed-Anchors and How Are They Used?

The USFS has defined fixed anchors to be any temporary or permanent hardware or nylon slings remaining on cliff or cave environments (Deyerberg 2000). Anchor types include pitons, 3/8-inch expansion bolts, bolt hangers, nylon webbing, chains, and fixed-chocks (see Figure1). The most controversial fixed anchor is the placement of expansion bolts, which requires a 3/8-by-3-inch bolt to be placed within a drilled hole in the rock. In designated wilderness, the only legal method of placing expansion bolts has been with a hand drill (propelled by manually swinging a hammer and turning a small bit clockwise). The placement of these expansion bolts most often requires the climber to hang from a steel hook while lead climbing from the ground to

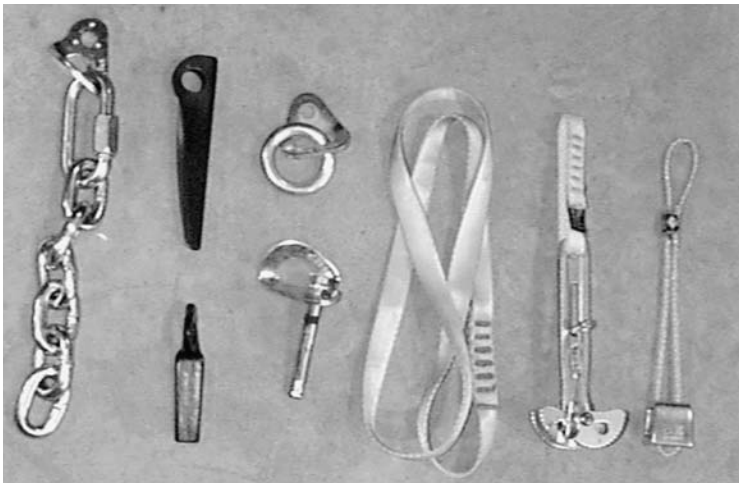


Figure 1—Anchor types from left to right: chain for rappelling, pitons, rappel ring, hanger with expansion bolt, nylon sling, and two types of removable climbing protection (cam and nut). Photo courtesy of Christopher Jones.

In 1988, the first ban of fixed anchors in wilderness occurred in the Superstition Wilderness in Arizona.

the top of the climb. Although battery-powered hammer drills are more efficient in placing bolts (e.g., 5 v. 30 minutes), wilderness managers and climber advocacy groups have both agreed that power drills are not consistent with definitions of wilderness. Fines, arrest, and confiscation have occasionally been necessary for such violations.

Fixed anchors have been used in areas now designated as wilderness for nearly 127 years. Fixed anchors were introduced to U.S. wilderness in 1875 during a first ascent of Half Dome in Yosemite by George Anderson, who drilled holes to place bolts in order to create footholds on the steep granite slab (Leonard and Brower 1940). In 1920, Albert Ellingwood and Barton Hoag placed metal pitons into the high peaks of the Colorado Rocky Mountains to protect their ascent of Lizard Head, now currently within the Lizard Head Wilderness (Middendorf 1999). In 1927, the first extensive application of multiple fixed anchors (pitons) was placed by Joe and Paul Stettner in what would become wilderness on Long's Peak in Colorado (Middendorf 1999).

In the 1930s, fixed anchors were used throughout soon-to-be designated wilderness areas in the Rocky, Cascade, and Sierra Mountains (Wilts 1962). A famous conservationist, former leader of the Sierra Club, and key advocate for passing TWA, David Brower, placed some of the first bolts at New Mexico's Shiprock in 1939. In 1947, John Salathé placed the first expansion bolts on the Lost Arrow Spire in Yosemite, which were similar to today's bolts (Wilts 1949). In 1957 and 1958, using fixed anchors, Royal Robbins, Warren Harding, and others made the first ascents of the vertical faces of the 3,000-foot El Capitan and 2,000-foot Half Dome, both of which lie within the Yosemite Wilderness boundaries. Robbins recognized a "leave-no-trace" ethic from the beginning and advocated minimizing the use of fixed anchors, as can be seen from many of his bold first ascents in Yosemite and elsewhere. This ethic began the roots of traditional climbing, which defined the use of anchors as being placed only when no removable protection (e.g., passive steel chocks and camming units) was available on very difficult or blank sections of stone (Athearn and Hill in press). This ethic was enforced by the climbing community throughout the 1960s and 1970s, with local resident climbers using crowbars to remove excessive bolts that were often seen as a detraction from the boldness and natural beauty of the climb.

With the evolution of sport climbing in the early to mid-1980s came a change of the traditional ethics of fixed-anchor placement. Many Europeans were already establishing climbs that were entirely protected by expansion bolts rather than traditional climbing protection, which was fixed much less often. Webster (1990) states that in 1986, a Frenchman, J. B. Tribout, began the practice of rappel bolting from the top down with the use of a power drill. Later, U.S. climbers began using battery-powered drills to place fixed anchors on rappel at popular crags in Oregon and Colorado state parks. "Old school" traditional rock climbers scoffed at this ethic and often exercised chopping (bolt removal) crusades in defense of their own climbing ethic. Despite the traditionalists' efforts, by the mid-1990s, sport climbers, who lead climb only with the use of fixed anchors rather than traditional protection, made up approximately 58% of the climbing population in the United States. (Kennedy 1996). Not only did the mainstream acceptance of fixed anchors change the boldness of rock climbing, the sport climbing ethic allowed the activity of climbing to become much safer and convenient for the general public, precipitating a dramatic increase in the number of climbers nationwide. In 1995, the number of climbers in the United States was estimated to be over eight million, resulting in dramatic growth in the number of climber visitor-days on public land (Cordell et al. 1997).

The Fixed-Anchor Controversy

This change in ethical standards dramatically increased the number of climbers, and the resulting proliferation of fixed anchors has resulted in an increasing number of fixed-anchor restriction policies within designated USFS wilderness. In 1988, the first ban of fixed anchors in wilderness occurred in the Superstition Wilderness in Arizona. The USFS organized a National Task Group on fixed anchors in wilderness, resulting in a number of further bans of fixed anchors and strict regulations in other wilderness areas. Ironically, in 1990 and 1991, following the formation of this task group, the USFS issued reports stating that fixed anchors have a "historical and legitimate use in wilderness climbing" (American Alpine Club 2002a, p. 1).

In 1996, Steve Wolper, an Idaho Conservation League board member and the only climber appointed to a USFS task force to examine a plan for the Sawtooth Wilderness, supported the argument that fixed anchors are visual impacts and illegal installations that violate TWA and U.S. Department of Agriculture regulations (Wolper 1998; Achey 1998). Later, fixed anchors were banned within the Sawtooth Wilderness after an appeal by Wilderness Watch.

After considering this appeal, Bill Levere, forest supervisor of the Sawtooth Wilderness, determined that the placement of additional fixed anchors would not be permitted. In response to the ban, Access Fund policy analyst Sam Davidson submitted a counterappeal, which resulted in the following statement, in the code of Federal Regulations, by the reviewing officer of the chief, Darrel Kenops, and set the stage for the current debate:

> The Wilderness Act prohibits the use of installations except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act. … It is our opinion that fixed-anchors qualify as installations and are not necessary to meet minimum requirements for the administration of the area for the purpose of the Act. Consequently, we believe that the use of fixed-anchors is prohibited within wilderness areas [36CFR 217.17 (f)].

Following the prohibition of anchors in the Sawtooth Wilderness, a ban was placed on fixed anchors in the Granite Mountain Wilderness, and, in 1998, USFS Chief Dombeck issued a prohibition on fixed anchors nationwide. The USFS reported that nearly 40 of its 412 designated wilderness areas contain substantial opportunities for rock climbing, each of which would be affected by the fixed-anchor decision (Salazar 1998). The prohibition of fixed anchors precipitated a heated national wilderness debate. Evidence of the magnitude of the controversy was reported by Jerry Stokes, USFS assistant director for wilderness, who stated that more phone calls and advocacy letters were sent in protest of the ban than for any other wilderness controversy that he had dealt with in the nation's capital (Baker 1999).

… both opponents and proponents of the ban raise important questions regarding the use and protection of wilderness.

During the 1998 campaign, the Access Fund remained the primary voice of climbers who opposed the ban, claiming that public stakeholders were not involved in the decision to ban fixed anchors (Davidson 2002). Powerful corporate interests such as Recreational Equipment Incorporated (REI) supported the Access Fund. At the urging of REI, which is headquartered in Washington State, Senator Slade Gorton of Washington added a rider (S.2237) to the USFS budget that reversed the fixed-anchor ban.

Facing the pressure of legislation that could possibly rewrite TWA, Undersecretary for Natural Resources and the Environment Jim Lyons lifted the ban and ordered the USFS to begin a negotiated rulemaking process to develop a fixed-anchor policy (Harter 2000). Lyons saw the negotiated rulemaking process as a way "to ensure that the public has the opportunity to be involved in the decision making process … and to avoid unnecessary lawsuits and inadvertent actions by Congress that would weaken the existing Wilderness Act" (USFS 2002). The decision allowed anchors to be placed in all national forest wilderness, with the exception of the Sawtooth and Granite Mountain Wilderness where earlier regional decisions still stood, until a final rule was issued. However, Lyons stated that any final rule should not interfere with the placement of removable anchors (e.g., slings, cams, nuts, and other temporary devices), which he argued had a minimal impact.

The Negotiated Rulemaking Process

Under direction from Lyons, the Negotiated Rulemaking Act of 1990 (P.L. 101-648), TWA of 1964, and the Federal Advisory Committee Act (P.L. 92-463) set the guidelines for stakeholder participation in the resolution of the fixed-anchor controversy. Reported to be an effective means of developing agreements in heated debates (Harter 2000), the process required decisions be made by unanimous agreement among a committee of stakeholders. Thus, each interest has a veto over the decision. If consensus is reached, the act requires the USFS to use the decision as the foundation for proposing a final rule, which may then only be modified by the agency after further public comments (Harter 2000).

Twenty-three representative stakeholders that would be substantially affected by the ruling were included

on the committee. In addition, the author of the Negotiated Rulemaking Act, Philip Harter, was selected as a neutral mediator of the process.

Issues and Outcomes of the Process

The central topics during the negotiated rulemaking were the interpretations of Sections 2(c) and 4(c) of TWA. Section 2(c) defines wilderness as being "without permanent improvements," while Section 4(c) states that "there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area." Harter (2000, p. 2) states that the confusion in interpreting the term *installations* stems from the fact that "the language of the Act is unmistakably of the Sixties, as indeed is its vision … it is the only natural resource law with a soul."

Opponents of the ban argued that the anchors left by climbers are comparable to materials left by many other visitor groups (see Figure 2). They stated that hunters leave behind thousands of bullets, cartridges, and shotgun shells, while anglers lose hooks, lures, flies, and sinkers. Contending that the authors of TWA never intended for climbing anchors to be equated with motorized vehicles and equipment, powerboats, and aircraft, opponents argued that to define these devices as installations unfairly targeted climbers and would eliminate the activity altogether. For example, opponents pointed out that outfitters in the Frank Church-River of No Return Wilderness were permitted to install permanent structures to support their operations (*see Wilderness Watch* v. *Robertson,* 92-0740, 1993). However, proponents countered that in *Wilderness Watch* v. *Robertson,* the court had ruled that permanent structures, including water systems and tent frames, were in direct conflict with the minimum requirements established within TWA (Nickas 1998).

Opponents also argued that despite the specific reference to the term installation, in "six thousand pages of testimony, nowhere was climbing ever alluded to in other than wholly permissible terms" (American Alpine Club 2002b, p. 1). Furthermore, wilderness climbing was cited in several federally commissioned reports and in congressional testimony as an appropriate wilderness activity consistent with the values of wilderness (Athearn and Hill in press; Keyser 1949). Wilderness Watch responded by stating that, although climbing may be an appropriate use of wilderness, climbers should be forced to ascend mountains as if they were the first climbers to attempt them (Nickas 1998).

Beyond the interpretation of TWA, several other issues surfaced during the rulemaking process. USFS representatives argued that they are opposed not to climbing, but to the biophysical and visual impacts of anchors that could weather cliff faces (Baker 1999). Yet, there is a lack of scientific evidence to support these claims. Proponents of the ban stated that, historically, bolts were placed relatively infrequently and are not justifiable at the level practiced by modern sport climbers. Opponents responded by presenting archival evidence that fixed anchors and climbing were a historical and symbolic use of wilderness.

The topic of economic impacts was discussed as a double-edged sword. Opponents to the ban argued that a fixed-anchor ban would displace far too many climbers, creating substantial economic impacts on local economies and corporations benefiting from wilderness. Several studies conducted in Red Rocks, Nevada, were submitted in support of this argument (Espey et al. 1998; Vossler et al. 1997). Cavlovic et al. (2000) found that economic losses to climbers in national forest wilderness

Figure 2—The Lone Peak Wilderness, where fixed anchors have been used for decades to ascend the 700-foot face. Photo courstesy of Christopher Jones.

exceeds $100 million annually, and, thus, the USFS proposal to ban anchors is indicative of a "major regulatory change" requiring a full benefit-cost analysis. However, proponents argued that since REI promoted the proposed rider language in the appropriations bill, big business was controlling wilderness policy. Proponents of the ban also claimed that the composition of the committee contained a majority that promoted the business of climbing.

The committee decided that the best way to arrive at consensus was to focus on the specific issue of how fixed anchors would be regulated. Five alternatives were developed by the committee: (1) allow the placement of three bolts for a descent with permit, (2) allow up to eight bolts to be placed on routes that would not accept removable protection and two bolts per route where removable protection was available (both excluding rappel/belay stations, which require two anchors), (3) require that new anchors cannot be placed, but allow anchors to be replaced on existing routes with the agency left to decide whether to remove an existing route, (4) allow additional anchors under strict regulations and a select number of existing anchors would be removed, and (5) prohibit a "net gain" of anchors in order to encourage dispersal and traditional climbing (Deyerberg 2000).

Although consensus could not be reached on the above alternatives, eventually, a possible compromise began to emerge: (1) there will be no new anchors unless climbers can demonstrate that they are in some way needed, (2) a higher burden of proof for areas that have not historically been used for climbing will be needed to justify permits to place anchors, (3) there should be a distinction in regulations between anchors used to go up and rappel down, (4) anchors should be allowed to be placed in emergencies without a permit, and (5) guidelines would be implemented on a wilderness-by-wilderness basis but not seek to control all placements in a single, national prescription (Deyerberg 2000).

After a year of meetings, and despite a strong effort to gain acceptance of the above, a consensus could not be reached. Three of the 23 stakeholders would not agree with the compromise. Discussion notes during the negotiated rulemaking stated that the groups who refused consensus might be looking toward the opportunity to hear their case in Congress—an opportunity that would be negated if consensus were reached. Two of the holdout stakeholders did not move from the position that the law prohibits all fixed anchors (Deyerberg 2000).

At this stage of the debate, according to the Negotiated Rulemaking Act, the final rulemaking falls back upon USFS authority. The original systemwide rule remains revoked, but bans are sustained in the Sawtooth and Granite Mountain Wilderness Areas. The USFS stated that the agency will rewrite the systemwide rule and went as far as developing a draft rule.

Implications for Managers and Policy Makers

Several implications can be drawn from the failure of the negotiated rulemaking. The process was revealed to be a less than effective means of resolving national-level issues in which the interpretation of TWA is at stake. This lack of resolution may continue to be the outcome of future debates because the act itself sets the stage for conflict between managing wilderness in a pristine condition and visitor behavior, which often leaves wilderness in conditions below the standards of TWA (Athearn and Hill in press).

We suggest that the agencies try again, and all four federal wilderness managing agencies should be involved. The rulemaking process should be modified so as to be more porous to historical and scientific (biological and social) evidence, and to public input. The use of evidence should be accompanied by the use of a neutral fact finder to rule on the facts. Such questions of fact might relate to the historical precedent of fixed anchors, congressional intent, and the extent of visual and ecological impacts. Without consideration of such evidence and a legal ruling on the facts, to demand that consensus be reached in a highly ideological and subjective case is unrealistic. The requirement of consensus will be extremely difficult to achieve, but may be more tractable by connecting the process to public input and the neutral fact finder.

In conclusion, both opponents and proponents of the ban raise important questions regarding the use and protection of wilderness. A total ban of all fixed anchors would clearly have a major impact on the majority of wilderness climbers, a visitor group that has traditionally supported wilderness values and has been a strong voice in the wilderness movement. Yet, allowing unchecked fixed-anchor installation represents a step backward in the century-old effort to protect wilderness values. The final decision will be somewhere in between. Time will tell whether that middle point is determined by courts, Congress, or the groups with a direct interest in the outcome.

REFERENCES

Achey, J. 1998. *From the Supes to the Sawtooths: The Fixed-anchor Trail.* Unpublished manuscript. Retrieved August 12, 2002, from http://www.paintedwall.com/pages/jeffspages/anchors.html.

American Alpine Club. 2002a. Fixed anchor ban chronology. Retrieved August 12, 2002, from http://www.americanalpineclub.org/policy/fixedanchorsusfschronology.htm.

American Alpine Club. 2002b. Congressional intent regarding wilderness climbing. Retrieved August 12, 2002, from http://www.americanalpineclub.org/policy/fixedanchorscongressionalintent.htm.

Athearn and Hill. (In press). Don't know much about history: How lack of historical emphasis doomed the Fixed Anchor Negotiated Rulemaking. Res Communes, *Vermont Journal of Environmental Law.*

Baker, B. 1999. Controversy over use of rock-climbing anchors may be missing the mark. *Bioscience* 49 (7): 529.

Cavlovic, T. A., R. P. Berrens, A. Bohara, P. Jakus, and W. D. Shaw. 2000. Valuing the loss of rock climbing access in wilderness areas: A national level random utility model. Unpublished manuscript. Albuquerque: University of New Mexico, Department of Economics.

Cordell, K., J. Teasley, and G. Super. 1997. *Results from the National Survey on Recreation and the Environment—All Forest Service Regions.* USDA Forest Service Final Report. Unpublished manuscript. Athens, Ga.: USDA Forest Service and the University of Georgia, Department of Agriculture and Applied Economics.

Davidson, S. 2002. Personal communications. June 21, 2002.

Deyerberg, R. 2000. Fixed Anchors in the Wilderness Negotiated Rulemaking Advisory Committee. Meeting summary notes—June 27–28, 2000. Unpublished manuscript. Retrieved August 12, 2002, from http://www.wilderness.net/issues/fs/fixed-anchor/mtgsum_4.htm.

Espey, J., J. Longhurst, J. Lopez, and W. D. Shaw. 1998. Rock climbing access and the Red Rock Canyon National Conservation Area. Cooperative Extension Fact Sheet 98–50. Las Vegas: University of Nevada, Cooperative Extension.

Harter, P. J. 2000. *The Potential for a Negotiated Rulemaking on Fixed Anchors for Climbing in Wilderness Areas Administered by the Forest Service.* Washington, D.C.: USDA Forest Service Covening Report.

Kennedy, M. 1996. Constant Feedback: Reader input helps shape the magazine, *Climbing Magazine* (159): 10.

Keyser, C. F. 1949. The Preservation of wilderness areas: An analysis on the problem. Washington, D.C.: Library of Congress, Legislative Reference Service.

Leonard, R. M. and D. R. Brower. 1940. A climbers guide to the High Sierra. *Sierra Club Bulletin* 25 (1): 48.

Middendorf, J. 1999 The mechanical advantage: Tools for the wild vertical. In A. Steck, S. Roper and D. Harris (eds.). *Ascent: The Climbing Experience in Word and Image.* Golden, Colo.: American Alpine Club Press.

Nickas, G. 1998. Permanent anchors don't belong in wilderness. Retrieved May 12, 2002, from http://www.wildwilderness.org/wi/nickas-g.htm.

Salazar, R. 1998. Fixed-anchor rule gains comment period. Retrieved May 12, 2002, from http://www.enn.com/news/enn-stories/1998/08/081998/anchors19_23094.asp.

U.S. Forest Service. 2002. Forest Service fixed anchor policy under review. Retrieved August 12, 2002, from http://www.fs.fed.us/news/today/2Sept98Text.htm

Vossler, C., W. D. Shaw, J. Hilger, M. Peterson, and G. Mitchell. (1997). The economic and recreational importance of rock climbing and recreation at the Red Rock Canyon National Conservation Area: Preliminary study results. Cooperative Extension Fact Sheet 97-12. Las Vegas: University of Nevada, Cooperative Extension.

Webster, E. 1990. To bolt or not to bolt? *Sierra* 75(6): 30.

Wilderness Watch v. *Robertson,* no. 92–0740, April 16, 1993, D.D.C.

Wilts, C. 1962. *Climbers guide to Tahquitz and Suicide Rocks, 3rd ed.* Glendale, Calif: La Siesta Press.

Wilts, C. 1949. Expansion anchors in climbing. *Sierra Club Bulletin* 34(6): 123.

Wolper, S. 1998. Recreation industry threat to conservationists. Retrieved May 12, 2002, from http://www.wildwilderness.org/wi/wolper.htm.

CHRISTOPHER D. JONES, assistant professor and program coordinator of recreation, Department of Physical Education and Recreation, Utah Valley State College, 800 W. University Parkway, Orem, UT 85058-5999, USA. E-mail: jonescd@uvsc.edu.

STEVEN J. HOLLENHORST, chair, Department of Resource Recreation and Tourism, University of Idaho and *IJW* Digest Editor. E-mail: stevenh@uidaho.edu.

2002 Excellence In Wilderness Stewardship Research Award

Co-sponsored by the USDA Forest Service and IJW

Professional stewardship of wilderness is dependent on a foundation of solid research. This award from the Chief of the USDA Forest Service recognizes excellent research conducted either by an individual or a team. Employees of the Federal and State governments, other private or public organizations, and private individuals are eligible.

Criteria for selection: (1) ability to identify management implications of the research; (2) creativity and innovation in scientific method; (3) effectiveness of research accomplishments in addressing wilderness stewardship issues of critical importance; (4) effectiveness in communicating research results to management; and (5) where appropriate, an interdisciplinary design of the research project occurred recognizing the interactions between the physical, biological, and social components of the wilderness resource.

Nomination submission: Request a nomination form and guidelines by e-mail from Don Fisher, USDA Forest Service National Wilderness Program Manager (dfisher@fs.fed.us).

Deadline for nominations: February 7, 2003.

State-Designated Wilderness Programs in the United States

BY CHAD P. DAWSON and PAULINE THORNDIKE

Introduction

While the 1964 Wilderness Act (TWA) in the United States pertains only to lands in federal ownership, many states have taken legal action to preserve state-owned lands with wilderness qualities (Cutler 1971; Trumbly and Gray 1984). State-designated wilderness areas add to the geographic and ecological diversity of areas given wilderness protection in the United States. In particular, Midwestern and Eastern states with limited federal lands can extend wilderness protection and stewardship to state lands and offer primitive recreation opportunities that might otherwise not be available.

A national survey in 1983 examined the establishment of state-level wilderness programs (Stankey 1984) and used five criteria to determine if a state had a state designated wilderness program: (l) statutory or administrative recognition of the program, (2) provision for preserving natural qualities and for offering primitive recreational opportunities, (3) prohibition of resource development activities, (4) establishment of area size, either as specific acreage or qualitative description, and (5) recognition of other values, such as features of historic or scientific interest, considered consistent with management as wilderness. Nine states were found to have wilderness preservation programs meeting these criteria in 1983 (Stankey 1984). In addition, three states had designated areas for wilderness protection and purposes, but did not meet all the criteria. Most states reportedly modeled their wilderness designation process on TWA of 1964. However, some important differences exist, such as in Alaska, where wilderness is either designated by the legislature or by the park administration that uses a zoning designation in units of the state park system. In California, the state legislature can designate wilderness, or proposals can be brought before the California Park and Recreation Commission (see Figure 1).

Article coauthors Chad Dawson (left) and Pauline Thorndike (right).

Most states reported a definition of wilderness similar to the 1964 U.S. federal definition. The most common variation was related to the minimum size of a wilderness area and reflects the typically smaller areas found in state ownership, such as the minimum of 1,000 acres (405 ha.) in Missouri. California requires 5,000 acres (2,024 ha.), the same as TWA; and New York recommends a larger minimum area of 10,000 acres (4,049 ha.). In 1983, there were reportedly 48 areas and 1.7 million acres (688,259 ha.) designated in the nine state programs (Stankey 1984).

The states typically accepted more evidence of previous human impacts in candidate wilderness areas compared to TWA (Stankey 1984). In Minnesota, for example,

Figure 1—The Anza-Borrego Desert State Park in Southern California has 386,000 acres (156,275 ha.) of designated state wilderness ($^2/_3$ of the park) in 12 subunits. Shown above is a Palm Oasis in wilderness in the Borrego Palm Canyon wilderness unit of the park. Photo by Marilyn Riley.

state wilderness must appear to have been primarily affected by the forces of nature, with the evidence of humans being substantially unnoticeable or where the evidence of humans could be eliminated by restoration. Similarly, in Alaska, resource modification within a wilderness zone of a state park was permitted to restore the area to a natural condition. The California legislation provides for the admission of areas where previous impacts had been already remedied or substantially restored to a near natural appearance.

California

The California legislature established the California Wilderness Preservation System (CWPS) in 1974. Three basic criteria govern admission to the system: (l) the land must be state owned; (2) the area must remain in, or have been returned to, or have substantially reestablished its principal, natural character, and influence; and (3) the area must be of sufficient size to make its preservation practicable. The 1974 legislation created two wilderness areas: the Santa Rosa Mountains Wilderness Area of about 87,000 acres (35,223 ha.) and the l0,000-acre (4,049 ha.) Mount San Jacinto Wilderness Area abutting the federally designated San Jacinto Wilderness. The CWPS is small compared to the federal wilderness acreage in the state, with 466,320 acres (188,794 ha.) in state ownership by 2002 as compared to 14 million acres (5.7 million ha.) administered by federal agencies in 2000. The types of wilderness areas in the California state system are an important complement to those in the National Wilderness Preservation System. Much of the land in the state system is in the Anza-Borrego Desert State Park; other areas are along the coastline and in mountain ranges along the coast. The CWPS adds to the broad diversity of ecosystems under wilderness protection.

By 1994 eight of the nine state wilderness programs studied by Stankey in 1983 were still operating (Peterson 1996). Florida had its wilderness legislation repealed when it came up for reauthorization in 1989, and the 10 wilderness areas there were transferred to other state land management programs. In 1994, 58 areas and 3.1 million acres (1.3 million ha.) were established in the eight remaining state programs.

State Survey on Wilderness Programs in 2002

We contacted the nine states identified by Stankey (1984) as having a state-designated wilderness system. Through a combination of telephone interviews and mail surveys during 2002, we documented changes in number of areas and acreages, and asked about the types of techniques used to manage visitor use and perceived threats to wilderness resources and values. Additionally, we contacted land management agencies in the other states to determine if recent legislation had created new state wilderness systems or designated individual wilderness areas.

In 2002, there were seven state wilderness programs still operating from the original nine studied by Stankey in 1983 (see Table 1). As noted previously, Florida no longer had a wilderness program and Minnesota was no longer listed in 2002 because there were no state-designated wilderness areas. Although previous studies reported that Minnesota state-owned land located within the federal Boundary Waters Canoe Area was a state wilderness, recent interviews and contacts with authorities in Minnesota indicated that it was never so designated by the state legislature.

The number of states with wilderness programs had declined since 1983, but

the total number of areas had increased from 48 to 74 areas and the total acreage from 1.7 million (688,259 ha.) to 2.7 million acres (1.1 million ha.) (see Table 1). Peterson had reported in 1994 that there were 3.1 million acres (1.3 million ha.) in eight state wilderness systems; however, reconciling the discrepancies between the number of areas and acreage in each state system between the 1983, 1994, and 2002 studies was not possible since numerous administrative and statutory adjustments and corrections had been made to the number and size of areas during that 19-year period. The most important observation was that the seven remaining state wilderness programs had made important progress from 1983 through 2002.

Most state designated wilderness areas are small in size with one-half the areas less than 5,000 acres (2,024 ha.) (see Table 2). About 96% of the total acreage in 2002 was in the states of Alaska, California, and New York; these three states reported the largest size areas and averaged over 86,000 acres (34,818 ha.) per area. The other four states included mostly the smaller size wilderness areas, and these averaged just over 2,700 acres (1,093 ha.) per area.

Managers were asked about the types of visitor management regulations used in their state wilderness areas in 2002. The three most commonly used restrictions were designating campsites, limiting group size, and limiting the number of people in a management area (see Table 3). State responses indicate that these restrictions are used, but not necessarily across all areas within any state. These results are nearly identical to those found by Peterson (1996) in his 1994 study.

Managers were asked to rate the severity in 2002 of 17 potential threats to state wilderness resources and values, as outlined by Hendee and Dawson (2001). All seven states reported that four potential threats were a slight to severe problem in their state: fragmentation and isolation of wilderness as ecological islands, increasing commercial and public recreation visits (see Figure 2), motorized and mechanical equipment trespass and legal use, and aircraft noise (see Table 4). Another

Table 1—The Characteristics of State Wilderness Programs in 2002, Based on Nine States Identified in 1983 (Stankey 1984) As Having a Wilderness Program.

State	Year Established	Wilderness Programs in 2002		
		Number of Areas	Total Acreage (hectares)	Level of Protection
Alaska	1970	3	922,700 (373,563)	administrative
California	1974	10	466,320 (188,794)	administrative and statutory
Florida	1970 (removed in 1989)	0	0	statutory
Maryland	1971	27	39,412 (15,956)	statutory
Michigan	1972	1	40,808 (16,521)	statutory
Minnesota	1975	0	0	statutory
Missouri	1977	11	22,993 (9,309)	administrative
New York	1972	21	1,170,312 (473,811)	administrative
Wisconsin	1973	1	6,358 (2,574)	administrative
TOTAL		**74**	**2,668,903 (1,080,528)**	

Table 2—Size of Wilderness Areas in the Seven States Identified As Having Wilderness Programs in 2002.

Wilderness Size in Acres	Number of Areas
Less than 1,000	11
1,000—1,999	16
2,000—4,999	10
5,000—9,999	8
10,000—99,999	20
100,000—1,000,000	9
TOTAL	**74**

Figure 2—The High Peaks Wilderness in New York's Adirondack Mountains is the largest area in this state system at 226,435 acres (91,674 ha.), and has the greatest recreation use per year with 140,000 visits. Photo by Chad Dawson.

eight potential threats were listed by four to six of the seven states as a slight to severe problem. Since management of most state wilderness areas is decentralized, many state-level managers do not get involved in day-to-day operations of each area. Thus, their responses were based on their general perceptions of statewide threats to wilderness and they reported a wide variety of severity ratings. Overall, the state-level managers expressed concerned about numerous threats to wilderness (see Table 4) that are similar to what Peterson (1996) reported in his assessment of 16 wilderness problems in 1994.

Individual State Wilderness and Wild Areas

Of the several states we contacted that did not have a wilderness program, some did have isolated wilderness areas. While some of these areas include the word *wilderness* in their name, they were established and operated more like natural areas (e.g., protecting a very specific natural location and related species) for interpretation and recreation opportunities, rather than as wilderness areas (e.g., providing solitude and primitive recreation opportunities). Examples include the Bridgestone/Firestone Centennial Wilderness in Tennessee, which was established in 1998 and is managed by the Tennessee Wildlife Resources Agency as a 10,000 acre (4,049 ha) preserve under protective restrictions against development and motorized vehicles and allows "low impact" recreation. The Nature Conservancy's Disney Wilderness Preserve was established in 1992 as a 12,000-acre (4,858 ha.) preserve managed for environmental education, interpretation of native flora, and fauna protection and restoration in wetland and upland areas of Florida. The Alakai Wilderness Area on the Island of Kauai in Hawaii is an approximately 9,000-acre (3,644 ha.) natural area to protect a rain forest wetland and is managed by the Division of Forestry and Wildlife. The 10,000 acre (4,049 ha.) Mountain Bridge Wilderness is managed within South Carolina's state park system.

Some of the best-known examples of state areas managed more like state and federal wilderness program areas are in Maine. Baxter State Park is a 202,064-acre (81,807 ha.) area managed by the Baxter State Park Authority to ensure that the Park "shall forever be kept and remain in the natural wild state" and to provide recreational opportunities to the public. The 92-mile long Allagash Wilderness Waterway in Maine was established in 1966 and then designated in 1970 as a state-administered river under the federal Wild and Scenic Rivers program. The Waterway includes

Table 3—Visitor Management Regulations Employed in Some Areas of the Seven States Identified As Having Wilderness Programs in 2002.

Visitor Regulations	Number of States Using (n=7)
Designated campsites	6
Group size limits	5
Limit number of people in the area	3
Length of stay limits	2
Require camping reservations	2
Trailhead quotas on use	1
Require travel permits that specify destination for each day	1

a "working forest" area allowing continued forest management and agricultural use.

Other areas managed for wilderness characteristics are included in state forestry programs. Examples include the "wild" forest designations used in Pennsylvania and New York to manage lands that have numerous wilderness characteristics, but that may allow such human intrusion as roads and motorized vehicle access.

We were unable to define and categorize all the different natural and wild area programs identified in our survey of the 50 states because of the great variety of program goals, protection approaches, and scale of operation, from comprehensive programs to individual and isolated protection efforts. We were able to locate one secondary data source that systematically documented one important and structured program—state natural areas programs within state park systems. However, there are many natural area programs that are not located in state parks, such as Minnesota's Scientific and Natural Areas Program that was created by the 1969 Minnesota Legislature. Its over 130 natural areas are administered by the Minnesota Department of Natural Resources. Similarly, there are private organizations such as The Nature Conservancy that own and manage natural areas in many states.

McLean et al. (2000), in a report on state park systems, noted that State Natural Areas (SNAs) increased 50% in acreage from 803,133 acres (325,155 ha.) in 1990 to 1,235,312 acres (500,126 ha.) in 1999. Thirty-one states reported SNAs in 1999, and the total acreage grew at a faster rate than any other type of park-administered area during that time period. SNAs include natural areas, protected areas, preserves, wild areas, and some wilderness areas. These SNAs are created to

Table 4—Wilderness Threats Reported As a Slight to Severe Problem by Each of the Seven States with Wilderness Management Programs in 2002.

Wilderness Threats	Number of States Reporting (n = 7)
Fragmentation and isolation of wilderness as ecological islands	7
Increasing commercial and public recreation visits	7
Motorized and mechanical equipment trespass and legal use	7
Aircraft noise	7
Exotic and nonnative species	6
Adjacent land management and use	6
Inholdings of private or public lands	6
Wildland fire suppression	6
Urbanization and encroaching development	6
Polluted air	5
Lack of political and financial support for protection and management	5
Loss of threatened and endangered species	4
Excessive administrative access, facilities, and intrusive management	3
Water storage facilities and related dams and reservoirs in wilderness	2
Advanced technology	2
Mining and extraction from established claims	2
Livestock grazing	0

Figure 3—The Siamese Ponds Wilderness in New York's Adirondack Mountains adjoins the cabin community where Howard Zahniser spent time writing and revising what became The Wilderness Act of 1964. Photo by Chad Dawson.

New York

The wilderness preservation movement in New York State began in 1885 with legislation to create the Forest Preserve lands. The citizens of the state then passed a referendum in 1894 to add constitutional protection to the Forest Preserve lands set aside within the Adirondack and Catskill Mountains. The most often quoted portion of the legislation is Article XIV, which, in part, states: "The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed." The state-owned Forest Preserve lands within the Adirondack and Catskill forests, in combination with extensive private land holdings, were established as the Adirondack and Catskill Parks. The specific designation of some of the Adirondack Forest Preserve lands as "wilderness" was first proposed by the state legislature in 1960 and finally adopted in 1972. The New York State definition of wilderness is nearly identical to the federal wilderness definition, except New York State requires a minimum size of 10,000 acres (4,049 ha.). Today, there are 17 wilderness management units in the Adirondack Forest Preserve, totaling more than one million acres (433,811 ha.). The latest addition was the 20,500-acre (8,300 ha.) Whitney Wilderness area in 1999. In 1985, four wilderness units in the Catskill Forest Preserve, totaling more than 100,000 acres (40,486 ha.), were created by state agency action. Overall, there were 1,170,312 acres (473,811 ha.) of wilderness in state ownership by 2002, as compared to the one 1,363 acre (522 ha.) federal wilderness in the state administered by the National Park Service.

protect significant natural resources and features. SNAs are most often fairly small areas of up to several hundred acres. Of the 478 SNAs in 2002, the majority were located in 10 states: Illinois (94), Colorado (71), Connecticut (43), Vermont (33), Oregon (29), Washington (23), Florida (22), California (16), Maine (16), and Maryland (16) (McLean 2002).

Conclusion

Wilderness preservation through state programs represents an important complementary activity to federal efforts in the National Wilderness Preservation System. The states have adopted and modified federal legislation to define wilderness and set management guidelines that apply to their own situations (see Figure 3). The total number of state wilderness areas increased 54% from 48 to 74 areas and increased 57% from 1.7 million (688,259 ha.) to 2.7 million acres (1.3 million ha.) from 1983 to 2002, even though the number of states with wilderness programs declined from nine to seven. In addition, many states are actively engaged in other types of programs, designed to protect the quality of the natural resources. The management of many state-level wilderness and natural area preservation programs is decentralized, and specific information about the areas and their management is difficult to collect. Given the tremendous diversity of program purposes, definitions, names, sizes, management approaches, and administration, there is a need for additional research on state-level wilderness and natural area preservation to better understand more specifically what problems and threats the areas and programs are facing. Most importantly, additional research could provide information about successful management approaches to mitigate and manage these numerous problems and threats.

REFERENCES

Cutler, M. R. 1971. Preserving wilderness through state legislation. In E. R. Gillette, ed., *Action for Wilderness.* Twelfth Biennial Sierra Club Wilderness Conference, September 25, 1971. Washington, D.C.: Sierra Club: pp. 104–112.

Hendee, J. C., and Chad P. Dawson. 2001. Stewardship to address the threats to wilderness resources and values. *IJW* 7(3): 4–9.

McLean, Daniel D. March 2002. Annual Information Report to the National Association of State Park Directors (vol. 24), Tucson, Ariz.

McLean, Daniel D., D. Chavez. and A. Hurd. February 2000. State parks: A diverse system. Paper presented at the 2000 Symposium on Social Aspects of Recreation Research, Tempe, Ariz.

Peterson, M. R. 1996. Wilderness by state mandate: A survey of state-designated wilderness areas. *Natural Areas Journal* 16(3): 192–197.

Stankey, George H. 1984. Wilderness preservation activity at the state level: A national review. *Natural Areas Journal* 4(4): 20-28.

Trumbly, James M., and Kenneth L. Gray. 1984. The California Wilderness Preservation System. *Natural Areas Journal* 4(4): 29–35.

CHAD DAWSON is managing editor of *IJW* and a professor at the State University of New York College of Environmental Science and Forestry in Syracuse. E-mail: cpdawson@esf.edu.

PAULINE THORNDIKE is a graduate student in dual Master's degree programs in Forest and Natural Resources Management at SUNY–ESF and in Environmental Policy and Administration in the Maxwell School at Syracuse University.

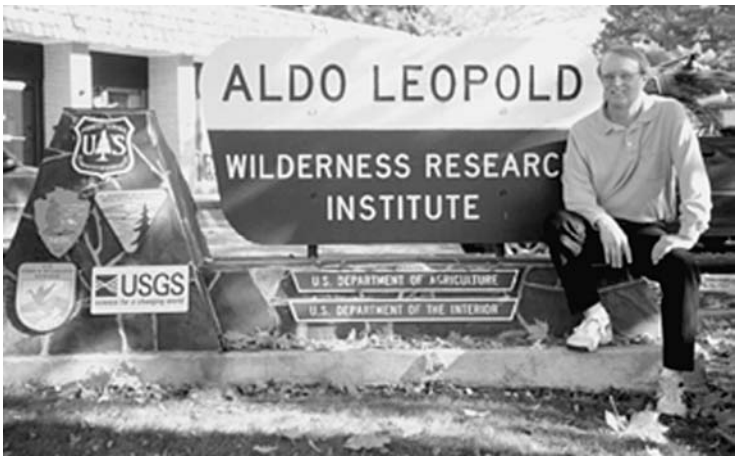
PERSPECTIVES FROM THE
ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

International Science Activities

BY DAVID J. PARSONS

The 1993 charter establishing the Aldo Leopold Wilderness Research Institute (ALWRI) recognized "the special roles that wilderness resources serve in the ecology, economy, and social fabric of the U.S.'s and the global environment." The Leopold Institute and its supporting agencies (U.S. Forest Service, Bureau of Land Management, Fish and Wildlife Service, National Park Service, and U.S. Geological Survey) recognize the importance of looking beyond national boundaries if we are to fulfill our vision as leaders in wilderness science. Not only is there much that can be learned from the management and science experiences related to wilderness issues around the world, but interest from other countries in the products and expertise provided by the institute and our cooperators has increased dramatically as our programs and expertise have become better known (see http://leopold.wilderness.net). In response to this challenge, the ALWRI has become increasingly involved in a wide range of international activities. Some of the more significant of these activities over the past several years include:

- Founding member that contributes financial support, executive and associate editorships, and frequent scholarly scientific and applied articles to *IJW.*
- Active leadership in the organization, and as presenters and facilitators of the scientific sessions at the 6th (India, 1998) and 7th (South Africa, 2001) World Wilderness Congresses. Publishing the proceedings of both those sessions.
- ALWRI scientist Alan Watson's 1999 Fulbright Scholar award in Finland led directly to active collaboration (including a conference in 2001) on wilderness-related issues of common interest to countries in the circumpolar north, including Canada, Finland, Norway, Iceland, Greenland, Russia, and the United States.



David J. Parsons, director of the Aldo Leopold Wilderness Research Institute.

- Organization of a workshop on simulation modeling of recreation use at a conference in Austria on visitor flows in recreational and protected areas.
- Provision of on-site expertise and consultation to wilderness, park, and other protected area managers and planners in Australia, Canada, and South Africa.
- Invited presentations by ALWRI staff members at international conferences and workshops in Scotland, England, Canada, Austria, Australia, Finland, New Zealand, Norway, Mexico, and South Africa.
- Support and participation in the International Seminar on Protected Areas (Montana) and the International Wilderness Management Workshop (South Africa).
- Recently hosting of visiting scientists from such diverse locations as Australia, Canada, Denmark, Iceland, Finland, New Zealand, Norway, Spain, Russia, South Africa, and Tunisia.

Continued on page 8

On the Spiritual Benefits of Wilderness

BY BAYLOR JOHNSON

Introduction

The term spiritual benefits, as used in this paper, means first "nourishing the spirit"—that is, providing positive psychological benefits, and second having some relation to established religious or spiritual traditions. I hope the experiences I describe will seem familiar to my readers, but it is clear that not everyone has them. Why some people respond spiritually to wilderness and others do not is a vitally important question for wilderness advocates, but not one I address in this article.

Here, I identify six benefits, the wilderness experiences that engender them, and a relation to a spiritual tradition. I refer to the six spiritual benefits as "the enduring," "the sublime," "beauty," "competence," "experience of peace," and "self-forgetting." In each case, I look for a psychological understanding of why these experiences are perceived as beneficial.

The Enduring

At least some of the yearnings underlying our spiritual experiences of wilderness seem universal. According to the teachings of the Buddha, for example, at the heart of human existence lies *duhkha*. Though often translated as "suffering," a better rendering might be "unsatisfactoriness" (Hagen 1997). *Duhkha* is a multifaceted concept, but a core element is the fact of change. Nothing abides. We ourselves, everyone we love, every institution and cause to which we devote our care exists for an instant in the great scheme of things. As a result, all our mundane hopes are doomed to failure, for if everything changes, nothing can be accomplished—not, anyway, as a permanent achievement.

This, to put it mildly, is not a happy thought. It should be equally obvious that the Christian idea of an eternal God conferring eternal life reveals a Western response to the same fear of impermanence. The solutions are different.

Article author Baylor Johnson.

Buddhism says that change and impermanence are ineluctable, and counsels us on how to live in peace with them. Christianity says that they are illusions, and that the deepest reality is eternal and unchanging. But though the solutions are different, the stimulus, the disquiet we feel before the threat of impermanence, is the same.

The eternal God of Christianity and Western monotheism cannot be experienced directly, so when He appeared to Moses He assumed the form of a burning bush; when He came to Job He was a mighty whirlwind. Like Job and Moses, if we are to experience God we must find Him in finite, or perhaps better, in analogous form. God is neither a whirlwind nor a burning bush, but each is godlike in a way—in power and mystery perhaps. So too, wilderness is godlike in answering our craving for something that endures in the midst of change. Rocks and rivers, if not eternal, are at least very old, and if each season is new and quickly fades, still the cycle of the seasons goes on, by comparison with our short lives, forever. I live and die in a few decades, but the giant sequoias stand for millennia. Whether because the Buddhists are right and nothing is truly unchanging,

or else because the theologians are right and eternity, though real, cannot be given to the senses, we can never experience the full eternity that monotheism attributes to ultimate reality. In wild nature, though, we encounter things and processes that are, from the perspective of puny human life, ancient enough to serve as stand-ins.

Whether one sees wilderness as God's creation or as a substitute for God, one can find comfort in identification with its enduring nature. This, which I shall call "the experience of the enduring," is the first spiritual benefit of nature.

Robinson Jeffers's poem "Their Beauty Has More Meaning" captures both this experience and the comfort it brought to him:

> Yesterday morning enormous the moon hung low on the ocean,
> Round and yellow-rose in the glow of dawn;
> The night-herons flapping home wore dawn on their wings. Today
> Black is the ocean, black and sulphur the sky,
> And white seas leap. I honestly do not know which is more beautiful.
> I know that tomorrow or next year or in twenty years
> I shall not see these things—and it does not matter, it does not hurt;
> They will be here. And when the whole human race has been like me rubbed out, they will still be here: storms, moon and ocean,
> Dawn and the birds.
>
> (1963, p. 77)

The power of this benefit results from encountering the enduring through direct experience of wilderness, not as a mere idea. Without the idea, our experience would be—as Immanuel Kant (1929) famously said—blind. ("Thoughts without content are empty, intuitions without concepts are blind," p. 93.) But we can have the idea anywhere and anytime. In wilderness we *encounter* the enduring because we come face to face with ancient things and timeless cycles, and it is this direct encounter that makes our sojourn in wilderness a moving spiritual experience.

Rock spires in the Bisti/De-na-zin Wilderness Area of New Mexico designated in 1984 and now with a total area of 44,365 acres. Photo courtesy of Bureau of Land Management.

The Sublime

Wilderness often provides images of immensity and power. The immensity of the mountains, the power of rivers, glaciers, the sea, are known directly when we travel in the wild. In their power, and their capacity to incite awe, they are almost God-like. We seem to have a natural craving to experience them. And in a strange sense we crave even the knowledge that all of them are indifferent to the human realm—stern and unrelenting like the God of the Old Testament.

These—the awesome power of wild nature and its indifference to human concerns—aesthetic theorists have called the sublime, and "experience of the sublime" is a second spiritual benefit of wilderness. Thoreau, after climbing Mt. Katahdin, described this experience vividly:

> Vast, Titanic, inhuman nature has got [the beholder] at disadvantage, caught him alone, and pilfers him of some of his divine faculty. She does not smile on him as in the plains. She seems to say sternly, why came ye here before your time? … Shouldst thou freeze or starve, or shudder thy life away, here is no shrine, nor altar, nor any access to my ear (1972, p. 64).

These impressions are powerful to a person in the wilderness. It can be a dangerous and scary place. Storms, the great predators, the huge forces of flood and avalanche, and even the very immensity of space, all demand respect that edges easily into fear. Beyond that, they all remind us in a visceral way of

Pearl Lake in the Selway-Bitterroot Wilderness of Idaho. Photo courtesy of U.S. Forest Service.

our comparative weakness and vulnerability. As wilderness advocate Howard Zahniser said, "To know wilderness is to know a profound humility" (Nash 1973, p. 214).

But what is it in us that responds to this humbling? Why do we want to encounter forces and powers that belittle us?

The explanation, I think, is that wild nature humbles not just us as individuals, but humankind and all of its ambitions. To be insignificant in a human crowd is often painful, for it reminds us that we have not achieved the fame and fortune that others have. To be insignificant in wild nature, by contrast, can be comforting, for wilderness dwarfs not only ourselves, but fame and fortune too. As Jeffers (1963) put it in "Calm and Full the Ocean"

> It is only that man, his griefs
> and rages, are not what they
> seem to man, not great and
> shattering, but really
> Too small to produce any
> disturbance. This is good.
> This is the sanity, the mercy…
> (1963, p. 84).

By the humbling of human aspirations and foibles, experiences of the sublime can lighten our spirits so that we enjoy the immediate and simple pleasures found in wilderness. The abundance of these joys, despite the simplicity and even danger and deprivation that wilderness travel can involve, points us toward further spiritual benefits of wilderness. There is, however, a mystery to be solved here that is similar to the mystery of how we can be comforted by encounters with the sublime. Why should the deprivation, exhaustion, challenge, and even the danger we find in wilderness bring us spiritual joy and peace, a feeling of being fully alive?

Surely many different things interact to produce the answer. What I have said above may form a background. In wilderness, we may already feel the comfort of identification with places and processes much grander and more enduring than our individual egos (the enduring), and feel too that the defeats and frustrations of our everyday lives are much less important than they seem from an office cubicle (the sublime).

Beauty

The beauty of wild nature helps to engender the spiritual peace and comfort we find there. Indeed, "experience of beauty" might be listed as a third spiritual benefit from wilderness experience. For the lover of wilderness, its beauty is not known by eye alone. We enter wilderness with all our senses and all our being: feeling the rain or breeze; smelling its pine and sage; hearing the water, the crack of lightning; seeing the world anew with each shift of light or perspective; not least, we know in our elemental core how our journey has entwined us—our comfort and our fate—with this landscape. This subject is, however, much too large to take on here, and I shall do no more than note the experience and its likely contribution to our embrace of wilderness experience despite its challenges and discomforts.

Competence

Two additional elements are involved in explaining why the trials and challenges of wilderness are often experienced as positive. The first I shall refer to as "the experience of competence" (Ewert 1983, 1985; Gass 1987; Kaplan and Kaplan 1983; McDonald 1983; Schlein, et al. 1990; Young and Crandall 1984; Zook 1986). When met successfully, challenges are likely to be perceived as empowering and as proof of our capability and worth, and these feelings contribute in turn to the calm, quiet spirit often experienced in the wild.

The trials we meet in wilderness are well suited to play this role, in part because they do not typically throw us into competition with other people. In competition against others there will be winners and losers. When, as we usually do in the wild, we struggle with our own limitations, success is much more

likely, if only because a defeat of one kind—failing to get to the mountain top, for instance—can be a triumph of another—the wisdom of knowing when to turn back. In this way wilderness experience encourages us to forget, temporarily at least, about competition, and to focus instead on competence—acquiring it, testing it, celebrating our possession and growth in it.

This sense that the wilderness is a place of testing from which we emerge strengthened and cleansed in spirit is not, of course, a modern invention. The worldwide tradition of vision quests and initiation rituals is a reminder of this. So too is the story that Jesus tested himself by a journey into the wilderness, which resonates with an even older tradition:

> The Israelites' experience during the forty-year wandering gave wilderness several meanings. It was understood, in the first place, as a sanctuary from a sinful and persecuting society. Secondly, wild country came to signify the environment in which to find and draw close to God. It also acquired meaning as a testing ground where a chosen people were purged, humbled, and made ready for the land of promise (Nash 1973, p. 16).

Experience of Peace

At least one more aspect of wilderness experience contributes to the peace we find there. The demands and challenges of wilderness experience focus the traveler's attention in the same way as activities that promote "flow" (Csikszentmihalyi 1990). The experience of flow is promoted by activities that involve risk and challenge near the limit, but within the participant's ability, that provide relatively swift and unambiguous information about success or failure, that provide opportunities for improvement of performance, and that thus focus the participant's attention, driving ordinary cares and anxieties from one's awareness.

The sublimity of wild nature humbles us, minimizing the importance of our individual selves, yet comforting us with its own grandeur.

The challenges we encounter in wilderness frequently have these characteristics. We need to get to a camping place by sundown; we need our tents to stand up to the storm. We need to get up and over the pass before that storm breaks. These are simple and direct challenges, but they are also important in obvious ways; meeting them depends on our own skills and effort, and success or failure will be unambiguous. They have the effect of driving out our familiar, everyday anxieties, and, at least when me have met them successfully, they leave us feeling peaceful, worthy, and open to the spiritual meanings of humility and eternity described earlier. This may not be the Bible's "peace that passeth understanding" (Phil. 4:7), but it is, I think, akin.

This benefit, "the experience of peace," is the product of all the other elements discussed. Identification with the enduring aspects of nature, minimization of ordinary concerns before nature's sublimity, physical removal from the sources of everyday anxieties, experience of beauty, feelings of competence, and the attention-focusing effect of the challenges encountered all contribute to the mental calm so often found in wild nature.

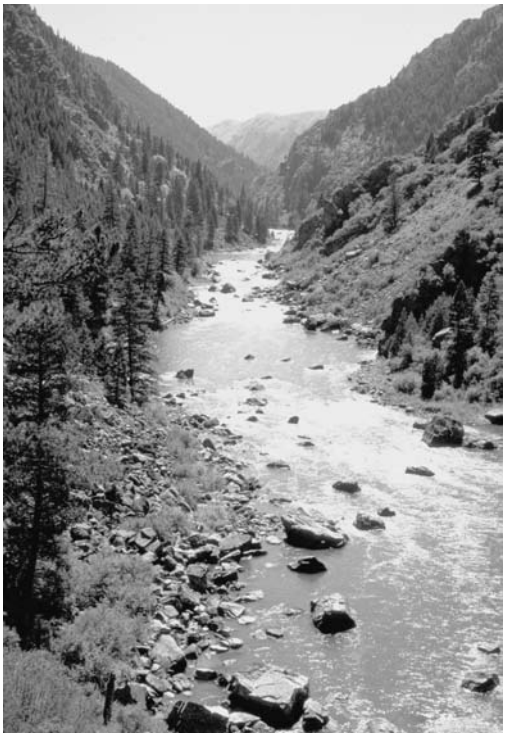
Self-Forgetting

All five previous benefits also contribute to a final benefit, that of "self-forgetting." To identify with the

Hikers exploring the lower Sonoran desert environment of the North Maricopa Wilderness in Arizona. Photo by Chad Dawson.

In wilderness we *encounter* the enduring because we come face to face with ancient things and timeless cycles, and it is this direct encounter that makes our sojourn in wilderness a moving spiritual experience.

enduring elements of nature, we must in some measure relinquish identification of ourselves with our individual egos. The sublimity of wild nature humbles us, minimizing the importance of our individual selves, yet comforting us with its own grandeur. Nature's beauty draws us beyond ourselves and into rapt fascination with our surroundings.



Beartrap Canyon was the first Bureau of Land Management wilderness and it is a unit in the Lee Metcalf Wilderness, MT. Photo courtesy of the BLM.

Similarly, the challenges that leave us feeling confident and peaceful do so by commanding our attention, leaving little room for direct concern with self.

This self-forgetting is extolled in nearly every spiritual tradition. Indeed, it might provide a concise summary of the goal of spiritual life. I do not suggest that the experience of self-forgetting found in the wilderness produces spiritual perfection, but it may be that it gives us at least a glimpse of the joy we are promised such perfection would bring.

Conclusion

I have discussed that in wilderness we can experience at least six spiritual benefits, which I have called "the enduring," "the sublime," "beauty," "competence," "peace," and "self-forgetting." I have tried to suggest connections for each of these to a spiritual or religious tradition, as well as a psychological explanation of how each leads to spiritual nourishment or benefit. My treatment has necessarily been brief, and each of these benefits deserves deeper examination. One form of examination would be social science testing of the hypotheses implicit in my claims.

REFERENCES

Csikszentmihalyi, M. 1990. Flow: *The Psychology of Optimal Experience.* New York: Harper and Row.

Ewert, A. 1983. *Outdoor Adventure and Self-Concept: A Research Analysis.* Eugene: Center of Leisure Studies, University of Oregon.

Ewert, A. 1985. Why people climb: The relationship of participant motives and experience level to mountaineering. *Journal of Leisure Research* 17(3): 241–250.

Gass, M. 1987. The effects of a wilderness orienteering program on college students. *Journal of Experiential Education* 10(2): 30–33.

Hagen, S. 1997. *Buddhism Plain and Simple.* New York: Broadway Books.

Jeffers, R. 1963. *Selected Poems.* New York: Random House.

Kant, I. 1929. *Critique of Pure Reason.* New York: St. Martin's Press.

Kaplan, S. and J. Kaplan. 1983. Psychological benefits of a wilderness experience. In I. Altman and J. Wohlwill, eds. *Behavior and the Natural Environment.* New York: Plenum Press: 163–204.

McDonald, D. 1983. The effect of participation in an outdoor experiential education program on self-concepts. Ph.D. dissertation. Stillwater, Okla.: Oklahoma State University.

Nash, R. 1973. *Wilderness and the American Mind,* rev. ed. New Haven, Conn.: Yale University Press.

Schlein, S., G. Lais, L. McAvoy, and C. Schatz. 1990. Outdoor recreation and integration: The effects on personal self-concept. *Therapeutic Recreation Journal* 2(4): 62–70.

Thoreau, H. 1972. *The Maine woods.* Princeton: Princeton University Press.

Young, R. and R. Crandall. 1984. Wilderness use and self-actualization. *Journal of Leisure Research* 16(2): 149–160.

Zook, L. 1986. Outdoor adventure programs build character five ways. *Parks and Recreation* 21(1): 54–57.

BAYLOR JOHNSON originally presented this paper in 2001 at the 7th WWC in South Africa. He is an Associate Professor in the Department of Philosophy at St. Lawrence University, Canton, NY 13617, USA. E-mail: bjohnson@stlawu.edu.

Białowieża Primeval Forest

The Largest Area of Natural Deciduous Lowland Forest in Europe

BY ANDRZEJ BOBIEC

Introduction

The Białowieża Primeval Forest (BPF) is an important lowland forest and a remnant of a natural deciduous, temperate forest ecosystem. The BPF is located on the border between Poland (58,000 ha. or 143,260 acres) and Belarus (67,000 ha. or 165,490 acres), 120 miles east of Warsaw. The Belarussian side of the BPF has been protected as a national park since 1991, and the Polish side includes the Białowieża National Park (BNP) covering only 10,500 hectares (26,000 acres) (17% of the Polish side). Half of the BNP is preserved as a Strict Nature Reserve (SNR) and has been approved as a Biosphere Reserve and the World Heritage Site in 1979.

The BPF has been protected in various ways for centuries. Currently, the most protected area is the SNR, where use is limited to scientific research and nature-based tourism. The remainder of the BNP is subject to limited intervention aimed at gradual restoration of natural characteristics and to provide supplemental winter forage to the unique woodland bison (*Bison bonasus*) that inhabit the area.

The entire BPF area on the Polish side is national property. More than 80% of that area, including numerous patches of old-growth forest and naturally regenerated stands, are subject to forest management conducted by the national forest agency (in Polish: Lasy Pamstwowe [LP]). Forest management involves harvesting, replanting, and pest control within the BPF outside the BNP.

At only 525 feet above sea level, the BPF covers a flat area of the watershed between the Baltic and Black Sea hydrological systems. The influence of continental climate causes a low average annual temperature of 43°F, cold winters with an average January temperature of 24.5°F, and an average annual precipitation of only 25 inches. The temperate forest is mainly represented by deciduous species of pedunculate oak, little-leaved lime, Norway maple, and hornbeam, but with an abundance of Norway spruce—a basic component of boreal forests. The woodland bison is the most well-known wildlife of the forest area. The focus of this article is on the Polish side of the BPF, which is subject to ongoing forest management and that could be protected, like the BNP, as the largest remaining deciduous lowland primeval forest in Europe.

Photo of author Andrzej Bobiec. Photo by M. Bobiec.

History of the BPF

How could a lowland deciduous forest persist in a natural state in this region of Europe, when it has been under continuous pressure from various rulers and governments since the Middle Ages? In the late 1300s, rule in Poland was taken over by the Great Duke of Lithuania, and this began the coexistence the of Kingdom of Poland and the Great Lithuanian Duchy. The duke declared the BPF forest area, located just on the border between Poland and the Lithuanian Duchy, as "royal" property and initiated a tradition of royal hunts. One hundred years later, almost 300 hundred rangers were employed in the royal forest area to keep the public from poaching and woodcutting. The rangers and their families were awarded continued royal service (intergenerational) and privileged access to the royal forest. By the 1620s, two types of management zones were designated in the royal forest: a mainstay area, reserved for

The lowland forest ecosystem in the Białowieża Primeval Forest. Photo by Andrzej Bobiec.

monarchs (de facto strict nature reserves), and peripheral forest compartments, used by the rangers and their families. The royal forest system lasted almost 300 years.

By the end of 18th century, there was no other forest in Europe with woodland bison, a species that historically was common in most parts of Europe. There were some grazing and game-breeding policies at the turn of 19th and 20th centuries, but the BPF was maintained almost unmanaged. Occasional forest harvesting occurred in the BPF when Russians ruled the area in the 19th century. During World War I (1914–1918), Germans began systematic industrial harvesting in the BPF. Since then the BPF has been gradually transformed into an area with a system of managed forestland.

Post–World War I political chaos allowed for excessive poaching that extirpated bison from their last natural forest range by 1919. In 1921, the nature preserve was designated on 4,700 hectares (11,500 acres) in a central part of the BPF. The area was managed as a nature sanctuary and was soon designated as the BNP, the first national park in Poland. The founder of the BNP, Professor W. Szafer, believed that national parks and nature reserves should remain "laboratories of wild nature and evolution." After World War II, the BPF was divided into the Polish and Belarussian areas. The Belarussian area was used as a special hunting ground for Communist Party members until 1991, when it was protected as a National Park.

According to the last forest inventory on the Polish BPF in 2001, forest stands that were 100 years old and older covered some 23% of the BPF. Over 30% of the BPF was secondary 60-to 80-year old stands that developed naturally on old, nonreplanted clearings. There is no other forest in Europe with such a large surface representing a well-advanced natural succession after the historic clearing of natural stands. Most importantly, the entire BPF could be protected like the BNP.

The Białowieża Primeval Forest is considered a natural heritage because of its long history of preservation and involvement of local communities.

What Have We Preserved?

The BPF is considered a natural heritage because of its long history of preservation and involvement of local communities. Some serious concerns remain about the future of the BPF.

The most well-known achievements following protection efforts in the BPF was successful restoration of a viable wild herd of European bison (approximately 600 animals are alive today in herds within Poland and Belarus) and the longest history of preservation in the BNP area. Ironically, establishment of the BNP has institutionalized the legal division of the BPF into areas for protecting natural forest processes and conditions, and a production forest, managed according to national forest management legislation. While the BNP is an important achievement, it requires that the management of the surrounding BPF supports the preservation of the BNP flora and fauna. For example, sustaining the woodland bison requires a larger range than the BNP provides, and these charismatic megafauna are the public symbols of naturalness for the BPF area. Less well-known and important species need protected area status to survive and thrive, such as wolves, or birds that nest in cavities of dead trees.

In an increasingly urban and agricultural world, rare and endangered forest ecosystems are dependent on protected late successional stages of natural communities. The biodiversity of the old-growth forest in the BNP is a

complex function based on the successional stage of the ecosystem, size of the area, and internal and external forest connectivity. A continuous supply of dead and downed forest wood contributes one-fifth of all aboveground forest biomass and secures long-term availability of various ephemeral habitats for myriad organisms, such as fungi (almost 3,000 species have been described in the BPF) and invertebrates. Many of the 10,000 species of insects found in the BPF have been defined as the old-growth relics, and several of them are reportedly extinct elsewhere. Many organisms are dependent on specific kinds of decaying wood.

A large number of old trees—living, sick, and dead—within the BPF provide for the ecological role of microhabitat redundancy, thus securing viability of populations dependent on such conditions. Uprooted trees within the lowland forest create new forest gaps by creating a physical barrier against intensive ungulate browsing on young trees. These regenerating forest patches then form a continuous mix of a new successional forest growth within the old-growth forest, so that the forest develops a complex mosaic of forest ecosystem structure. For example, the SNR within the BNP is the only forest area where all nine forest species of European woodpeckers nest. Maintaining the perpetuity of this shifting forest mosaic from initial to climax to decadential is a necessary condition for conservation of the endangered biodiversity.

The BPF and BNP are the last lowland forest in Europe where wolves and lynx naturally control red and roe deer populations. As in tropical natural forests, the breeding success of singing birds in this forest area depends more on the raptor (e.g., eagles and hawks) predation than on the food supply. These natural conditions and processes result in a wide diversity of bird species, but relatively small populations.

The BNP itself is not a self-sustaining ecosystem. For example, a lynx needs a territory as large as the SNR, and the territory of a single wolf pack is over twice as large as the protected area. The BNP needs the buffer area of the BPF to sustain these populations of predators. The dynamic structure of forest stands depends on natural perturbations that may be controlled during forest management activities within the BPF. For example, the natural regeneration of oak requires a high rate of disturbances, such as forest gaps created by infestations of round-headed bark beetles in spruce stands. These two species—long-living oak and a major gap-maker, spruce—seem to be strongly interrelated. Spruce seeds are dispersed by the great spotted woodpecker when the birds fix spruce cones into the thick bark of old trees, mainly oaks, during their attempts to feed on spruce seeds from the cones. In this way, the combination of old oaks and woodpeckers feeding on spruce seeds tends to create clumps of spruces—the future gaps necessary for oak regeneration following infestation by round-headed bark beetles. This cycle of oak and spruce regeneration is not likely to persist if the natural forest gap pattern is constrained by "pest control" of round-headed bark beetles, even if such pest control is only performed outside the SNR.

Norway maple covered by epiphitic mosses in the Białowieża Primeval Forest. Photo by Andrzej Bobiec.

Pest tree removal in the Białowieża Primeval Forest. Photo by Andrzej Bobiec.

The vision of extending the Białowieża National Park into the entire Białowieża Primeval Forest is one way to meet urgent conservation needs and to boost social and economic development in the region … .

In spite of some losses that have already occurred, there is still time to maintain or restore a self-sustained ecosystem and to prevent further loss of biodiversity. Such a restoration of natural processes and conditions requires a comprehensive management system involving natural disturbance patterns in the BNP and the entire BPF.

Pressure for Forest Products

According to the national forest agency (LP), Poland is too poor to "waste" a large amount of the marketable timber needed in the local economy. The claims that current forest management and harvesting is a required condition for the future of the BPF. However, due to long-term oversupply of cheap timber from Russia and Scandinavia, Polish forestry businesses are suffering from a deep economic recession. The LP forest management activity in the BPF (0.7% of the forestland in Poland) relies on national subsidies. The local economy, partly dependent on timber, does not necessarily need the relatively expensive wood from the BPF. For example, some community leaders complain that unless the trend of migration of young, educated people from the region to the large cities is reduced, the losses to the local social traditions and culture will be irreparable. Forestry seems to be of little interest to the local youth and has limited capacity to keep them in their hamlets.

While "multipurpose forestry" is a driving paradigm in the European Union (where forests comparable to the BPF were gone 200 years ago), the LP arguments for forest management are also made on an ecological basis. The LP observes that foresters must eradicate forest pests, otherwise spruce will disappear. The LP claims they must help nature in remodeling stand composition to be better adapted to soil and the changing air quality in Poland.

Riperian forest in the Białowieża Primeval Forest. Photo by Andrzej Bobiec.

Extend the BNP into the Entire BPF?

Since the beginning of the LP multipurpose forestry campaign, a great emphasis by conservationists was put on the socioeconomic aspects of legislation that supported the conservation of natural forests. According to the conservationists, the government is responsible for preservation of the remnants of natural forest as a living national monument and a laboratory of nature. They further claimed that the BPF was the best local and regional natural attraction and it should be both preserved and used by the local communities as an attraction, for visitors and tourists.

In 2000, a group of volunteers—ecologists, biologists, and foresters—mostly residents of the Białowiża region, discussed the principles of the BNP and how they could be extended to the entire BPF in Poland. The project involved representatives of many stakeholder groups. According to their discussion, a national park covering the entire BPF is the best legal approach to secure conservation of the BPF. The national park management approach could use zoning to preserve the clusters of old-growth forest, wetlands, and breeding areas of rare wildlife species (e.g., bison, wolf, lynx, eagle). In forest restoration zones, moderate silviculture measures could be applied to mostly secondary growth and artificial stands, where management will restore natural forest systems while providing for locally needed firewood and raw wood material (approximately 70,000 cubic meters per year versus the 2001 extraction rate 120,000 cubic meters).

Logging could be replaced by ecotourism as an engine of local development. The BPF has great tourism potential for the local communities to develop as gateways to the BPF, especially if it becomes more of a national park. According to a recent informal survey, the majority of the estimated 100,000 visitors each year come to the BPF either to see the natural forest or a woodland bison. The gateway communities could provide unique opportunities to show both the cultural and environmental uniqueness of the area through information and interpretation programs. According to the conservationists' discussion on the BPF region, it should host a permanent international center for studies on natural forest ecosystems, both for higher education and for cooperation between scientists studying natural forest areas.

The vision of extending the BNP into the entire BPF is the one way to meet urgent conservation needs and to boost social and economic development in the region—two compatible and complementary elements of this unique European region. After 10 years of an intense national campaign, it seems that a concerted and strong international assistance could help save what Poland has contributed to the European biological heritage through centuries of protection from the royal forest to the modern-day BPF and BNP.

REFERENCES

Bobiec, A. 2002. Living stands and dead wood in the Białowieża forest: Suggestions for restoration management. *Forest Ecology and Management* 165: 121–136.

Bobiec, A., H. Van der Burgt, K. Meijer, C. Zuyderduyn, J. Haga, and B. Vlaanderen. 2000. Rich deciduous forests in Białowieża as a dynamic mosaic of developmental phases: premises for nature conservation and restoration management. *Forest Ecology and Management* 130:159-175.

Falinski, J. B. 1986. Vegetation dynamics in temperate lowland primeval forests: Ecological studies in Białowieża Forest. In J. B. Falinski, ed., *Geobotany.* Dordrecht, Netherlands: Dr W. Junk Publishers: 39–111.

Gutowski, J. M., W. Jedrzejewski, A. Bobiec, J. B. Falinski, C. Okolów, J. Popiel, B. Jedrzejewska, B. Brzeziecki, and A. Korczyk. 2000. Principles of the Białowieża National Park functioning after its extension onto the entire Polish side of the Białowieża Primeval Forest (Proposition). Białowieża, Poland: Białowieski Park Narodowy. (In Polish with English translation).

Jedrzejewska, B., and W. Jedrzejewski. 1998. Predation in vertebrate communities: The Białowieża Primeval Forest as a case study. *Ecological Studies.* Berlin: Springer: 135.

Tomialojc, L. 1991. Characteristics of old growth in the Białowieża Forest, Poland. *Natural Areas Journal* 11: 7–18.

Woodland bison in the Białowieża Primeval Forest. Photo by Andrzej Bobiec.

ANDRZEJ BOBIEC is the chair of the Society for the Protection of the Białowieża Primeval Forest of Poland, and he wrote this article while a visiting scholar at the State University of New York College of Environmental Science and Forestry in Syracuse under funding from The Kociuszko Foundation. He can be reached at andrzej.bobiec@wp.pl.

Livelihood Security and Protected Area Management

BY STEPHEN F. SIEBERT and JILL M. BELSKY

Introduction

Livelihood security, the extent to which individuals and households have an adequate and reliable means of meeting food and income needs, is widely recognized as an important component of development efforts (Food and Agriculture Organization of the United Nations 1989). Livelihood security and economic well-being also directly affect forestland use practices and biodiversity conservation (Bruner et al. 2001, Geist; and Lambin 2002).

Conflicts between resident people and protected area managers, particularly over property rights and livelihood activities occurring within areas now designated as parks, have been widespread (West and Brechin 1991). Over the past decade, many protected area management efforts have attempted to address local economic development in the context of biodiversity conservation, most commonly through Integrated Conservation and Development Projects (ICDP) (MacKinnon and Wardojo 2001). Critics of ICDPs assert that the projects have not achieved their objectives, that development and conservation are incompatible, and that conservation requires more vigorous enforcement efforts (Struhsaker 1998; Terborgh 1999). ICDP proponents argue for fostering local economic development and conservation, and conclude that unless local livelihood security concerns are addressed, conflicts between resident people and protected areas will continue, social inequities and injustices will increase, and protected areas will remain threatened (Wilshusen et al. 2002).

Livelihood security has become an increasingly unattainable goal for many rural people. Timber harvesting, conversion of forests to export cash crops, road development, migration of nonresident populations into previously remote regions, increasing socioeconomic differentiation, and the establishment of protected areas have transformed both the environment and livelihood practices of millions of households throughout the tropics (Geist and Lambin 2002; Li 2001; Putz et al. 2001). While most rural people have historically been engaged to some extent in the market economy, a major implication associated with these changes is an increase in household dependence on the cash economy to purchase staple foods (Collier et al. 1994).

Article authors Stephen F. Siebert and Jill M. Belsky.

This article discusses the role of local food production in livelihood security and reasons why protected area managers need to recognize local food production issues. We draw on research conducted in a remote forest village (72 households) adjacent to Lore Lindu National Park (LLNP) in Sulawesi, Indonesia, from 1996 to 2000. LLNP is a 231,000-hectar (570,570 acre) preserve that contains one of the largest remaining primary forests in Sulawesi and a large proportion of that island's endemic flora and fauna. The park was established by Indonesian government decree in 1982 specifically to conserve the region's rich biological diversity and to protect the upper watersheds of several rivers crucial to lowland irrigated rice production and hydroelectric energy generation. While Indonesian government officials and international conservationists consider the area to be wilderness, it has been inhabited and profoundly influenced by humans for thousands of years. In fact, Neolithic sculpture remains are a major LLNP tourist attraction.

Four distinct ethno-linguistic/cultural groups reside in and around LLNP. Like forest-dwelling people throughout Indonesia and other tropical regions, traditional livelihood strategies include small-scale shifting cultivation, irrigated rice farming, forest gathering, and hunting. LLNP is encircled by several dozen villages and includes two enclaves where people have lived for centuries. When LLNP was established, all traditional forest livelihood practices, including farming, gathering, and hunting, were prohibited. The assumption that traditional livelihood practices are incompatible with biodiversity conservation and their subsequent prohibition is typical in Indonesia and in most tropical protected area management efforts, despite the fact that these activities have occurred in tropical forests in association with biological diversity for centuries.

We surveyed a random sample of 25% of village households in 1996 and resurveyed the same households again in 1999 to explore changes in household food security, livelihood practices, and forest use. We also conducted in-depth interviews with community members and village leaders on an annual basis over the five-year period from 1996 to 2000.

Forest Use, Livelihood Strategies and Protected Area Management

Until recent decades, village households relied on long-fallow shifting cultivation, hunting, forest-product collecting, and the sale of cash crops to secure food and other livelihood needs. Farmers began cultivating coffee (*Coffea canephora*) under mature trees (i.e., shade grown) and established irrigated rice fields in the valleys in the early 1960s. Rattan, a long-climbing palm, which has been used for binding and basketry for generations, became a source of cash income in the 1980s with the emergence of a market for canes used in furniture manufacturing. Farmers throughout the region began to cultivate cacao (*Theobroma cacao*) in the early 1990s. Government officials began vigorous park enforcement efforts in the 1990s, and by 1995 villagers reported that they had ceased all cultivation within LLNP.

The establishment of LLNP and the emergence of commercial rattan gathering and cash crop cultivation (outside the park) significantly affected local land use practices and household food security. Prior to the establishment of LLNP, most households met annual food needs by cultivating rice and other foods through shifting cultivation, hunting and the collection of wild fruits and vegetables. By 1996, only three households were able to meet their entire rice needs through cultivation (all through irrigated rice farming). All other households depended upon the sale of rattan and/or cash crops to purchase rice and other food staples.

Our household surveys and interviews reveal that average household food production is very low (see Table 1). In 1996, cultivation provided an average of eight months of rice self-sufficiency per household, and that declined to less than four months in 1999 (due in part to severe drought). Ninety percent of households gathered rattan from LLNP for cash income to purchase food. Farmers reported that the productivity of upland farming was declining due to the inability to shift fields and observe long forest fallows to regenerate soil fertility and reduce weed populations. Villagers attributed this to LLNP regulations. Cacao was increasingly being planted in former shifting cultivation fields, further reducing household food production. Finally, all households interviewed in 1996 supported construction of a proposed trans-Sulawesi highway along the southern LLNP boundary in the hope that it would reduce the cost of transporting rattan, coffee, and cacao to market, and lower imported staple food prices.

Prior to 1980 there was little commercial harvesting of rattan in the region. However, as rattan supplies were exhausted in other areas of Southeast Asia, exploitation shifted to Sulawesi. The emergence of commercial rattan harvesting coincided with the establishment of LLNP and cessation of shifting cultivation. While government

Table 1—Household (n = 20) Livelihood Activities in 1996 and 1999 in an Indonesian Forest Village.

Household Livelihood Activity	1996	1999
Rice		
Cultivating irrigated rice as owner or tenant	70%	85%
Household rice self-sufficiency (mean no. months)	7.9 months	3.4 months
Perennial Crops		
Cacao planted	75%	100%
Cacao producing	20%	55%
Coffee planted	85%	85%
Coffee producing	70%	80%
Collect Rattan	90%	95%

Our central point is that there is an important role for agriculture, particularly food crop production, in tropical protected area management efforts.

regulations prohibit both rattan collecting and shifting cultivation, the diffuse and nomadic nature of rattan gathering and small number of forest guards makes it difficult to regulate cane harvesting. Thus, shifting cultivation in LLNP was effectively stopped, but rattan harvesting emerged as a crucial source of cash income to purchase staple foods.

The cultivation of cacao is also a recent activity. In the 1970s, cacao was not cultivated in the community. However by 1999, 100% of village households had at least one parcel planted to the crop. Cacao cultivation expanded throughout Sulawesi in the 1990s in response to growing market demand, high prices, desire by farmers to establish private property rights, and land purchases by local elites and migrants with capital and political connections (Li 2001).

During the 1990s, household food security and general economic well-being became more dependent upon the price of rattan, coffee, and cacao. Coffee and cacao exhibited extreme price volatility between 1996 and 2000 (see Table 2), while the cost of rice and other household necessities (e.g., cooking oil, sugar, fish, clothing, etc.) increased. Over the five-year study period, the dollar equivalent prices of rattan, coffee, and cacao declined, even without adjusting for inflation.

Informal interviews with 20 villagers in 2000 suggest that household economic conditions deteriorated over the five-year period. In 1998, households and village leaders expressed particular concern over declining food security and growing conflicts in nearby areas between migrants and long-term residents, conflicts that overlapped with ethnic and religious identities. Several experienced farmers were also concerned about the sustainability of cacao grown under full-sun conditions in former shifting cultivation fields. Finally, villagers expected social and economic conditions to worsen.

The Search for Food Security and Its Implications for Forest Conservation

By the late 1990s, households lacked access to sufficient forest and land resources to provide basic household food and livelihoods. Reports on conditions elsewhere in Sulawesi reveal similar patterns: food production decreased both relatively and absolutely as small holders converted former shifting cultivation land to commercial tree crops (Li 2001). Religious and ethnic violence were increasing in nearby areas, while national economic and political conditions were deteriorating. Shifting cultivation and food security were distant memories for most households.

Concerns over local livelihood security stimulated much discussion throughout the village, and in 1999 community leaders organized the community to act. Specifically, they encouraged households to return to shifting cultivation of upland rice in an area now within LLNP, but which they had cultivated in 1980 and 1960 prior to park establishment. While farming this site is now illegal, villagers concluded that their socioeconomic condition necessitated action and that park guards had limited capacity to enforce regulations (national governmental authority declined at the local level following the resignation of Suharto in 1998).

In reopening the shifting cultivation site, households agreed to several conditions: (1) the approximately 40 ha.-site would be cleared and prepared collectively, (2) individual households would plant and cultivate rice based on their particular requirements, and (3) all rice produced was to be consumed locally (i.e., it would not be sold or traded). The site was cleared in the summer of 1999, burned before the onset of rains in October, immediately planted to upland rice, and harvested in late spring 2000 (see Figure 1). By August 2000, the site was reverting to fallow; stumps had resprouted and secondary forest vegetation was well established. Through this effort, households secured a one- to three-year supply of rice and no longer needed to raise income to purchase it (see Figure 2). The timeliness of the undertaking was dramatic since Central Sulawesi erupted in widespread ethnic and religious violence in June 2000.

Table 2—Market Prices of Coffee, Cacao and Rattan in Palu, Sulawesi (in U.S. Dollars per kg).

Commodity	July 1996	July 1998	July 2000
Coffee	$1.67	$0.90	$0.59
Cacao	$1.19	$1.27	$0.64
Rattan (30—35 mm diameter)	$1.31	$0.22	$0.27

Economic, political, and social forces and the ways in which villagers respond to them are complex, fluid, and calculated on both community and individual household conditions and capabilities. Rather than being static, unwilling to face risk, market-averse, and unconcerned about environmental conditions (as some stereotypes of remote rural farmers maintain), the efforts and calculations of villagers attest to their creativity and readiness to embrace opportunities when they arise. In the case-study village, all households responded to the high price of cacao by planting it in upland farms and all those interviewed in 2000 (n = 20) had reversed their previous view and opposed construction of the trans-Sulawesi highway, fearing that it would increase the risk of in-migration, conflict and undesirable economic and social influences.

"Illegal" rice cultivation provided households with food and livelihood security and reduced rattan collecting inside LLNP. Importantly, cultivation of rice for one to two years, followed by 20 years of fallow without the use of petrochemical inputs is sustainable even on extremely infertile sites. Furthermore, it does little to alter the wild character of the area—an area that has been inhabited and subject to small-scale hunting and shifting cultivation for centuries.

In 1999, community leaders applied to the provincial government for permission to develop permanent irrigated rice fields on forestland outside LLNP. The Indonesian government has supported establishment of irrigated rice around timber concessions under the HPH Pembina Desa Program (Logging Concessions Community Development Program). The attention to food production and livelihood security is an approach that could be utilized around national parks. However, as of August 2000, villagers had not received a response from the government.

Conclusion

The conservation of biodiversity and long-term viability of LLNP and other tropical protected areas will likely be determined, in part, by the extent to which resident people achieve secure livelihoods (Bruner et al. 2001; Wilshusen et al. 2002). Other major unaddressed threats to tropical protected areas include commercial logging, forest conversion to plantation agriculture, road building, and migration (Putz et al. 2001). While issues of power and politics constrain attempts to control these latter factors, international conservation efforts have emphasized a wide variety of income-generating activities among resident people in and around protected areas (MacKinnon and Wardojo 2001). In Central Sulawesi, for example, both the Integrated Area Development and Conservation Project, funded by the Asian Development Bank, and The Nature Conservancy support perennial cash crop cultivation in buffer zones. However, comparable efforts to increase the productivity and sustainability of food crop cultivation are lacking.

Our central point is that there is an important role for agriculture, particularly food crop production, in tropical protected area management efforts. While improving food security should be a goal in and of itself, it can also serve the interests of forest conservation. Furthermore, working to assist rural people to secure a diverse and stable economy fosters a type of environmentalism that supports, rather than subverts, social justice principles. In so doing, we suggest that protected area management is likely to have a greater chance of being not only effective, but sustainable over the long run.

Figure 1—Milling rice with shifting cultivation field.

Acknowledgment

We are grateful to the friendship and assistance provided by those with whom we worked in Sulawesi. Funding was provided by grants from the USAID Program in Science and Technology Cooperation and The Nature Conservancy, Program Indonesia.

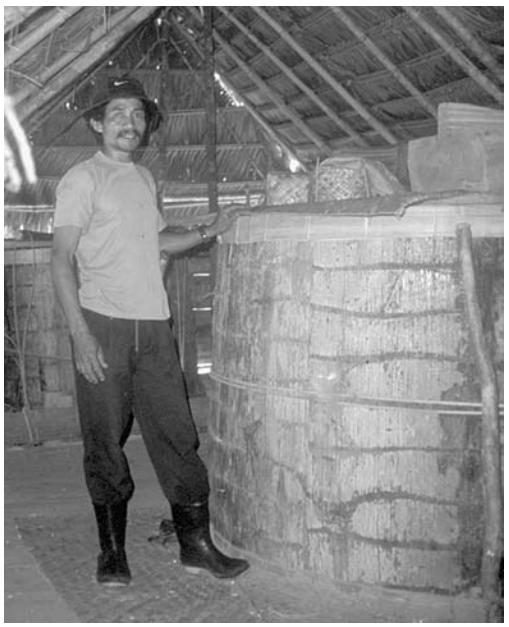


Figure 2—Traditional rice storage container.

Conflicts between resident people and protected area managers, particularly over property rights and livelihood activities occurring within areas now designated as parks, have been widespread.

REFERENCES

Bruner, A., R. Gullison, R. Rice, and G. da Fonseca. 2001. Effectiveness of parks in protecting tropical biodiversity. *Science* 291: 125–128.

Collier, G., D. Mountjoy, R. Nigh. 1994. Peasant agriculture and global change. *BioScience* 44: 398–407.

Food and Agriculture Organization of the United Nations, 1989. *Household Food Security: An Analysis of Socio-economic Issues.* Rome: FAO.

Geist, H., and E. Lambin. 2002. Proximate causes and underlying driving forces of tropical deforestation. *BioScience* 52: 143–150.

Li, T. 2001. Agrarian differentiation and the limits of natural resource management in upland Southeast Asia. *IDS Bulletin* 32(4): 88–94.

MacKinnon, K., and W. Wardojo. 2001. ICDPs: imperfect solutions for imperiled forests in South-East Asia. *Parks* 11(2): 50–59.

Putz, F., G. Blate, K. Redford, R. Fimbel, and J. Robinson. 2001. Tropical forest management and conservation of biodiversity: An overview. *Conservation Biology* 15: 7–20.

Struhsaker, T. 1998. A biologist's perspective on the role of sustainable harvest in conservation. *Conservation Biology* 12: 930–932.

Terborgh, J. 1999. *Requiem for Nature.* Washington, D.C.: Island Press.

West, P. and S. Brechin, eds. 1991. *Resident Peoples and National Parks.* Tucson: University of Arizona Press.

Wilshusen, P., S. Brechin, C. Fortwangler, and P. West. 2002. Reinventing a square wheel: Critique of a resurgent "protection paradigm" in international biodiversity conservation. *Society and Natural Resources* 15: 17–40.

STEPHEN SIEBERT and JILL BELSKY are professors in the School of Forestry at the University of Montana. Stephe welcomes correspondence at School of Forestry, University of Montana, Missoula, MT 59812, USA. Phone: 406-243-4661; e-mail: siebert@forestry.umt.edu.

From BOOK REVIEWS on page 47

In very much the style of Barry Lopez's *Arctic Dreams*, Mulvaney has compared and contrasted the stories of the poles into the separate stories of particular animals, peoples, and industries. Beginning with an introduction to the poles in human psyche and the fact that "penguins live in the Antarctic; polar bears live in the Arctic" (p. 19), the author provides historical interpretation of the bowhead whale (chapter 2), sealing (chapter 3), whaling and controversy within the International Whaling Commission (chapter 4), politics and activism (chapter 5), and oil exploration (chapter 6).

The major theme running through the entire book is that of the polar regions as the "last wilderness," and how the polar wilderness has been exploited, how nations and companies have fought and resolved to protect such wilderness and how nongovernmental organizations, namely Greenpeace, have assisted in the process. The final chapter of the book (chapter 7), apart from summarizing, illustrates the significance of this last wilderness: it is important as an indicator of global health and more widespread environmental problems, but also as a place demonstrating the value of conservation to humanity. The appropriateness of tourism as the primary way in which growing numbers of e people now experience the polar wilderness is left as a question for the reader to ponder and form their own opinion about.

Overall, *At the Ends of the Earth: A History of the Polar Regions* is a joy to read and an important contribution to appreciating the wider context of interconnections occurring all over the Earth. Mulvaney's writing style is a combination of personal experience, touches of humor and irony, and in-depth, concise research. Mulvaney expertly conveys the fact that "for eons the Polar Regions existed through stasis and change, without any hint of involvement … but as the world grows smaller, the ends of the Earth are no longer out of reach … more accessible, and potentially more vulnerable than ever before" (p. 245). If this is true for the poles, then the same can definitely be said for all wilderness.

Reviewed by PATRICK MAHER, Ph.D. candidate at Lincoln University, New Zealand, who is examining the tourist experiences and outcomes in Antarctica. E-mail: maherp@lincoln.ac.nz.

Announcements and Wilderness Calendar

COMPILED BY STEVE HOLLENHORST

New Initiative Targets Advertising Industry

How about that polar bear that sleds on glaciers to sell you Coca Cola … and the innocence and sweetness of baby elephants, hippos, and giraffes that market disposable diapers? Excursions through pristine mountain wilderness to sell nearly every brand of SUV … and that wild lion that roars before every MGM film? We see and hear every day the sights and sounds of wild nature in print, on television, and on the radio. The bottom line is, they bring in revenue when they are used by corporations to capture brand loyalty, sales, and market share.

Celebrities and star athletes and human actors we don't recognize also tout corporate brands. But the difference between them and wild animal actors is that the former usually receive handsome pay for their time. One could even argue, "while some performers go on strike, others go extinct!"

Elaborate props and computer images are copyrighted by advertisers as backdrops to sales ads, but wilderness mountains, oceans, and skies are part of the commons we all share. The values of wild nature are borrowed for free across product markets, but the corporations do not necessarily have a commitment to preserve them.

The WILD Foundation has announced a new initiative to survey wild nature image use in major advertising media and to quantify and classify this use of "nature's commons" for private profit. The results, as they roll out over the next 18 months, will be shared with the advertising industry and the corporate sector as a part of "The WILD Awards: Advertising with Integrity for Nature," which has been reported in previous issues of the *IJW* Digest. The WILD Foundation will keep us closely apprised of its findings. For more information contact info@wild.org.

U.S. Appeals Court Rules in Favor of Grand Canyon Quiet

Fifteen years of hard work coupled with vigorous citizen action have finally paid off. A panel of judges from the U.S. Court of Appeals has just ordered the Federal Aviation Administration to write more stringent rules for restoring natural quiet to Arizona's Grand Canyon National Park. Judge Merrick Garland wrote the August 16th opinion for a three-judge panel siding with the Grand Canyon Trust and other conservation groups. The Court invalidated use of a full-year average for measuring "natural quiet" and remanded the case, requiring that the FAA use a stricter standard and reconsider its decision to ignore commercial and other non-tour aircraft noise when measuring noise at Grand Canyon National Park.

Partner conservation groups also joining in this significant victory are the Friends of the Grand Canyon, Grand Canyon River Guides, Inc., National Parks Conservation Association, the Sierra Club, and the Wilderness Society. The ruling was issued within days of the 15th anniversary of passage of the 1987 National Parks Overflights Act. In the decision, the Court echoes the importance of this law to the American public and visitors from around the world: "As the [Grand Canyon] Trust points out, the use of an annual average does not correspond to the experience of the Park's annual visitors. People do not visit the Park on 'average' days, nor do they stay long enough to benefit from averaging noise over an entire year. For the typical visitor, who visits the Grand Canyon for just a few days during the peak summer season, the fact that the Park is quiet 'on average' is cold comfort."

In holding that the FAA failed to explain the exclusion of commercial airliners and other, non-tour aircraft in estimating noise at Grand Canyon,

Submit announcements and short news articles to STEVE HOLLENHORST, *IJW* Wilderness Digest editor. E-mail: stevenh@uidaho.edu.

the Court also worded its order strongly: "The agency cites no direct evidence that the noise from non-tour aircraft is minimal," the Court said. "…the record of evidence indicates that the exclusion of non-tour aircraft from the calculation of the percentage of time that aircraft are audible may well have a significant impact on the results." The 1987 Overflights Act requires the "substantial restoration of the natural quiet" at Grand Canyon. In a 1994 report to Congress, the National Park Service defined this to mean that no aircraft should be audible in 50 percent or more of the Park for 75 to 100 percent of the day.

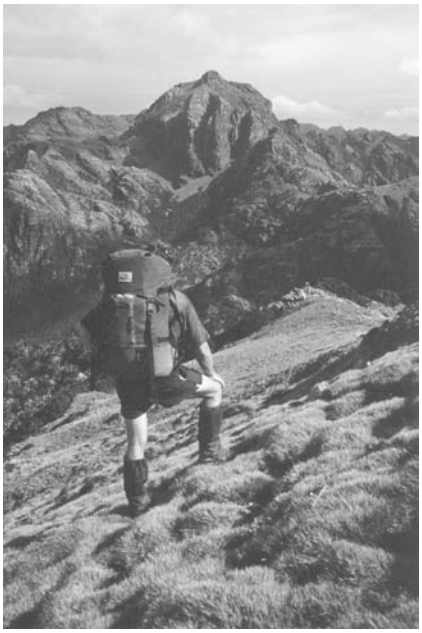
For a copy of the ruling by the U.S. Circuit Court of Appeals for the District of Columbia Circuit, visit http://pacer.cadc.uscourts.gov/common/opinions/200208/00-1201a.txt. For more information on efforts to achieve quiet in national parks, visit the National Parks Conservation Association at www.npca.org/across_the_nation/visitor_experience/motorized_abuse/overflights.asp. Source: Grand Canyon Trust: www.grandcanyontrust.org/press.

Geocaching Brings New Threat To Wilderness

Geocaching, a game that has players search with Global Positioning System units for containers full of small prizes that are hidden in remote areas, is causing new problems for wilderness managers. Illegal trails are springing up and damaging plant and animal habitat as well as spreading invasive nonnative plants. The popularity of the two-year-old game is spreading rapidly, both in the United States and around the world. It is estimated that California has at least 4,000 geocaches hidden throughout the state. For more information on geocaching, see *Orange County Register* at www.bayarea.com/mld/cctimes/news/weather/environment/3776845.htm, or join the online discussion on the Wilderness Information Network at www.wilderness.net.

New Zealand—Two New Wilderness Areas Formally Approved

Gordon Cessford, from the Department of Conservation in New Zealand, reports the approval of two wilderness areas on public conservation land on the South Island's West Coast. The areas are the Adams Wilderness Area and the Paparoa Wilderness Area. The two areas were first proposed for wilderness status in 1979 by Federated Mountain Clubs and had been managed as wilderness for 20 years. They were formally approved by Conservation Minister Sandra Lee after extensive public consultation. "Public support for the management of these areas as wilderness has been expressed on a number of occasions over the years and most recently in formal public consultation undertaken by the Department of Conservation earlier this year." Ms. Lee said the setting aside of wilderness is an act of humility by society and recognizes that some places should be left where nature reigns supreme. "We are extremely fortunate in New Zealand that, unlike some countries, we still retain areas of true wilderness. For the wilderness to endure, however, we need to actively ensure the wildness of these areas is not compromised."



Exploring the new Paparoa Wilderness Area, Paparoa National Park, New Zealand. Photo courtesy of Jono Calder, Department of Conservation. (Crown Copyright: Department of Conservation *Te Papa Atawhai.*)

The boundaries of both wilderness areas had been modified in response to concerns raised in a number of the public submissions relating to access. The size of the Adams Wilderness has been reduced by 9,300 hectares (22,971 acres) to 46,812 hectares (115,626 acres), and the Paparoa Wilderness reduced by 1,600 hectares (3,952 acres) to 30,768 hectares (75,997 acres). The core of the Adams Wilderness Area contains the vast snowfields of the Garden of Eden and the Garden of Allah, which drain to the Perth and Wanganui rivers in the west. The Bracken snowfield, which drains to the Whitcombe River, is also included. Kea, rock wren, blue duck (kowhiowhio) and falcon (karearea) are key native bird species found in the Adams Wilderness.

The Paparoa Wilderness Area is located along the northeastern side of the Paparoa Range. It includes rugged mountains that form the headwater catchments of the Ohikanui and Ohikaiti Rivers in the northeast and the Otututu (Rough) River in the southwest. The area has a variety of distinctive vegetation as a result of the geology and landforms. The area is also home to rare indigenous birds, such as great spotted kiwi and kaka.

Ms. Lee said the two areas would continue to be available for wilderness recreation. "Aerial access will not generally be possible but there is no

shortage of mountainous areas on the West coast open to air access. These two wilderness areas help retain a spectrum of recreational opportunities." The announcement brings the number of designated Wilderness Areas in New Zealand to 10. These are managed to preserve indigenous biodiversity and pristine natural features and exclude all buildings, structures, signs, trails, or any other sign of human presence.

For more information, visit the New Zealand Department of Conservation website at www.doc.govt.nz/Whats-New/Media-Releases.asp.

Wilderness Photographer Galen Rowell Killed in Plane Crash

Acclaimed outdoors photographer Galen Rowell and his wife, Barbara Rowell, were killed along with two others in a plane crash near the Bishop (Inyo County) airport on their way home from a photo workshop class in Alaska. Rowell, 62, was known for his wilderness photography in the California Sierra and across all seven continents. Rowell's death shocked many outdoors people who considered him to be one of the world's pre-eminent photographers of natural settings and an avid outdoorsman who brought remote areas into the public realm. In 1984, Rowell received the Ansel Adams Award for his contributions to the art of wilderness photography. In 1992, he received a National Science Foundation Artists and Writers Grant to photograph Antarctica. Over his career, Rowell made trips to the mountains of Nepal, India, Pakistan, China, Tibet, Africa, Alaska, Canada, Siberia, New Zealand, Norway and Patagonia. He is credited with making the first one-day ascents of Mount McKinley in Alaska and Kilimanjaro in Africa as well as first ascents of Himalayan peaks such as Cholatse and the Great Trango Tower. Reprinted from *San Francisco Chronicle*.

Protecting Our Diverse Heritage Conference Set for April 2003

The conference on Protecting Our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites is an interdisciplinary joint conference of the George Wright Society (GWS) and the National Park Service (NPS), and incorporates two of the country's leading conferences on parks and cultural sites.

The George Wright Society Biennial Conference is the United States' largest interdisciplinary conference on protected areas, a term which includes a broad array of places—both cultural and natural—managed by different entities: national, state/provincial, and local parks; historic and cultural sites; research areas and designated wilderness within national and state forests, grasslands, wildlife refuges, and other public lands; tribal reserves; marine, estuarine, freshwater, and other aquatic sanctuaries; private land-trust reserves; and similarly designated areas. The GWS is unique among professional organizations because it encourages dialogue and information exchange among all the people needed for protected area conservation, from historians to biologists, managers to researchers, public agencies to private organizations, academics to field personnel. The GWS conference brings people together to share problems and information, hear new perspectives, and contemplate critical questions about the future of protected areas.

The Cultural Resources 2003 (CR2003) conference will be the second in a series of nationwide forums, convened by the NPS, for discussing how to increase awareness of the value of cultural resources, for strengthening communications among NPS cultural resources staff and NPS partners, and for discussing best practices and recent developments in cultural resources management. CR2003 participants represent the full range of people who work with cultural resources: archaeologists, architectural historians, archivists, conservators, cultural anthropologists, cultural resources managers, historians, historic architects, interpreters, landscape architects, property managers, and many more. CR2003 will address heritage preservation planning and technical services, National Historic Landmarks and National Register properties, community preservation planning, and more.

The event is an excellent opportunity to address issues related to science and the management of wilderness, parks, and other natural areas. For more information, visit the conference website at www.georgewright.org/2003.html

The Gondwana Link: Connecting Ecosystems of Southwestern Australia

Southwestern Australia is internationally renowned for its ecological diversity. Tens of millions of years of evolutionary interaction across some of the Earth's oldest land surfaces has created a major "biodiversity hotspot." Sadly, massive clearing of vegetation for agriculture has fragmented the old evolutionary pathways. Combined with climate change and other sources of land degradation, the long-term viability of much of the region's biodiversity is in doubt.

The Gondwana Link Project, led by The Wilderness Society of Australia, is an initiative that will effectively link the ecosystems of inland Western Australia (WA) with the wetter forests of the southwest corner. It aims to restore ecological connectivity from the

woodlands of WA's Goldfields, via five of the region's significant wild places, to the karri and jarrah forests of the Margaret River area—a distance of almost 1,000 kilometers.

This is a cooperative effort from a broad range of community and nongovernmental organizations. Initially, it is composed of The Wilderness Society, Greening Australia, Fitzgerald Biosphere Group, Friends of the Fitzgerald, Mallee Fowl Preservation Group, and the Australian Bush Heritage Fund. A full-time project coordinator has been employed.

Collectively, the partner organizations bring together a wide spectrum of conservation strategies, including public advocacy, revegetation and land care, land purchase and property covenanting, and the provision of incentives for conservation on private land. By working collectively toward a long-term plan, each group's conservation efforts will be complementary—so that, when completed, there will be protected bush from Margaret River to Kalgoorlie and beyond.

At the western end of the project, the boundaries of the new "old-growth forest" national parks (won as a result of the last state election) are being negotiated with Gondwana Link objectives in mind. Elsewhere, existing national parks have been defended from mining and roading, and intensive land-care actions are now being undertaken. For more information, visit The Wilderness Society of Australia website at www.wilderness.org.au.

New Antarctic Protected Area System

Antarctica, the coldest, windiest, and driest continent on Earth, is recognized as one of the world's last great areas of wilderness. Largely unmodified by human activity, Antarctica provides a unique platform for the study and monitoring of global warming, ozone depletion, global pollution, and globally important ecosystems. The 1991 Protocol on Environmental Protection to the Antarctic Treaty designates Antarctica as a natural reserve, devoted to peace and science. With the recent completion of Annex V on Area Protection and Management, elaborated by two dozen states and organizations, a new Protected Areas System is now entering into force. With the approval of all Consultative Parties to the Antarctic Treaty, the new system changes the protected area classification process from one based on Sites of Special Scientific Interest and Specially Protected Areas, to one using the new categories of Antarctic Specially Protected Areas and Antarctic Specially Managed Areas. These may be designated for broader purposes than previously and, significantly, marine areas may now also be included. This is the most substantive revision of the Antarctic Protected Areas System since its establishment in 1964. For more information, please visit the World Commission on Protected Areas at: http://wcpa.iucn.org/region/antarctic/antarctic.html#news.

Economic Reasons for Conserving Wild Nature

A study in the journal *Science* (Aug. 9, 2002: 950–953) authored by 19 scientists, reports that there are compelling economic reasons for conserving wild nature areas. "On the eve of the World Summit on Sustainable Development, it is timely to assess progress over the 10 years since its predecessor in Rio de Janeiro. Loss and degradation of remaining natural habitats has continued largely unabated. However, evidence has been accumulating that such systems generate marked economic benefits, which the available data suggest exceed those obtained from continued habitat conversion. We estimate that the overall benefit:cost ratio of an effective global program for the conservation of remaining wild nature is at least 100:1." By wild nature they mean "habitat in which biodiversity, nonbiotic components, and ecosystem functioning are sufficiently intact that the majority of ecosystem services typically derived from such a habitat are still being sustainably and reliably supplied." The authors argue that it is an economic and moral imperative that wild nature be retained as much as possible "through a judicious combination of sustainable use, conservation, and, where necessary, compensation."

Wilderness Legislation in the 106th and 107th Congress

The 106th Congress approved a total of eight Wilderness bills adding more than 1 million acres of public land to the National Wilderness Preservation System (NWPS), bringing the total amount of designated Wilderness in the NWPS to over 105 million acres. This is the largest number of acres of Wilderness added to the NWPS since 1994 and is a stark contrast to the 105th Congress, which added no new Wilderness areas to the NWPS. While the 107th Congress may not surpass the wilderness achievements of the 106th, there are a number of wilderness bills pending in the 107th Congress, several of which are likely to become law before the end of the year. The James Peak Wilderness in Colorado and additions to the Black Elk Wilderness in South Dakota have already been approved by Congress and signed into law by President Bush. Source: The Wilderness Society www.wilderness.org/ccc/wsc/update.htm#one.

Book Reviews

Return of the Wild: The Future of Our Natural Lands

Edited by Ted Kerasote. 2001. Island Press, Washington, D.C. 225 pp., $15.00 (paper).

The Pew Wilderness Center was established in April 2000 as an attempt to respond to the perceived lack of public knowledge on wilderness issues in the United States. *Return of the Wild* is a concrete reflection of this educational agenda, the first annual edition of a proposed series of edited books intended to provide readers with historical perspectives, an awareness of contemporary concerns, and a forum for debate on wilderness issues.

This first edition provides a wonderful benchmark for promised future editions. An excellent coterie of authors, including Vine Deloria, Jr., Jack Turner, Michael Soulé and Richard Nelson, address an interesting and wide-ranging selection of wilderness issues, and incorporate a range of approaches. Despite this variety, each chapter has been carefully written and edited to provide both an accessible writing style as well as a sound referencing system, which can be a difficult balancing act.

The writing styles range from a journalistic style reviewing specific issues (e.g., reintroducing the Grizzly [Todd Wilkinson], the importance of buffer zones [Florence Williams], or the social and ecological perils of elk farming [Hal Herring]), to more personal musings such as those provided by Nelson in his concluding chapter on "Joining Souls" through respectful hunting, to more "practical" chapters on the political decision-making quagmire (Mike Matz) and how to counter the age-old claim that creating protected areas—especially wilderness—will "lock up" valuable resources and thus lead to economic decline (Thomas Michael Power). Other issues include the thorny issue of the wilderness concept among indigenous peoples of the United States (Deloria), the equally controversial link between Christianity and wild places (Steven Bouma-Prediger), a historical depiction of early wilderness leaders (Chris Madson), and a fascinating discussion of the possible danger of biotechnology on wildlands (Turner). In addition, a Wildlands Map, illustrating the remaining wildlands in the United States, and a U.S. Road Network map, showing major U.S. roads provide (literally and figuratively) a graphic illustration of how few wildlands are left, and how they are geographically isolated to Alaska and the western continental United States. However, the maps' usefulness is somewhat limited by the large scale and small size of the illustrations provided.

Return of the Wild is a very useful addition to the growing number of edited books on wilderness, perhaps mostly because it does not stray from its intended purpose and the mission of the Pew Wilderness Center: that is, this book incorporates a very informal, nonacademic writing style—at a very attractive price—in a collection that attempts to educate the American public on some of the most important issues and challenges facing wilderness today. Congratulations are due to the Pew Wilderness Center and Island Press for committing to an annual publication. Based on the quality of this first edition, this and future editions deserve a very wide audience indeed.

Review by JOHN SHULTIS

At the Ends of the Earth: A History of the Polar Regions

By Kieran Mulvaney. 2001. Island Press, Washington D.C. 286 pp., $24.95 (hardcover).

The idea that the Earth's two Polar Regions—the Arctic and Antarctic—have interconnected histories is not a new one, but today their shared plights are increasingly thrust into the public eye. *At the Ends of the Earth: A History of the Polar Regions* collates and reviews these histories and controversies, piecing them together into one seamless story of exploration, exploitation, and the struggle to save the "last wilderness" from humanity. Kieran Mulvaney explores how these two unique regions have shared, interwoven histories: from their initial discovery, through five centuries of exploration, even to their contemporary threats and the debate over their future.

Continued on page 42

Guidelines for Contributors

Editorial Policy: The *International Journal of Wilderness* (*IJW*) invites contributions pertinent to wilderness worldwide, including issues about stewardship, planning, management, education, research, international perspectives, and inspirational articles. The *IJW* solicits manuscripts not previously published or simultaneously submitted elsewhere. Materials revised or reoriented by the author(s) sufficiently to constitute a new contribution are also welcome. Authors are requested to accompany their manuscripts with a cover letter explaining: (a) any previous use of data or information in the manuscript and how the submitted manuscript is different, or (b) that it has not been submitted elsewhere for publication. Please indicate the type of manuscript you are submitting (e.g., peer reviewed). The International Wilderness Leadership (WILD) Foundation holds copyright for materials printed in the *IJW.* Authors will be asked, prior to publication, to assign their rights to the WILD Foundation, unless the work is not subject to copyright, such as that of government employees. *IJW* reserves the right to edit all manuscripts.

Four Major Article Types

1. **Peer-Reviewed Manuscripts.** These are science reports of wilderness-related research. It is strongly advised the Results (factual) and Discussion (interpretive) sections be kept separate to enhance clarity; sections reporting recommendations and implications are encouraged. Articles must have an Abstract of 50 to 100 words, in which objectives, methods, and major findings are clearly summarized. Photos, with captions illustrating key points in the submitted text, are strongly encouraged. The target length for manuscripts is 2,500 words, which requires a clear focus, clarity, brevity, and logic in writing.

2. **Feature Manuscripts.** These are reports of wilderness-related stewardship, planning, management, international, and education issues presented in a factual manner. Manuscripts are reviewed by *IJW* editors. Sections reporting recommendations and implications are encouraged. Photos, with captions illustrating key points in the submitted text, are strongly encouraged. The target length for manuscripts is 2,500 words, which requires a clear focus, clarity, brevity, and logic in writing.

3. **Letters to the Editor and Commentaries** consist of a reasoned argument (approximately 500 words) on an important wilderness issue, such as a research program, a change in administrative procedure, and so forth, and may culminate in recommendations or proposals for some action. Photos with captions are encouraged.

4. **Announcements and Book Reviews.** Announcements of meetings and important events, photos, administrative policy updates, major personnel changes, and special event information are welcome for the Wilderness Digest section. Send materials for the Digest directly to *IJW* editor Steve Hollenhorst at stevenh@uidaho.edu. Suggestions for books to review are welcome, but book reviews are solicited by the book review editor, John Shultis. (shultis@unbc.ca)

Style and Form. Manuscripts must be submitted in final form. The author is responsible for accuracy of data, names, quotations, citations, and statistical analyses. Submissions from the United States of America will use English units, followed by metric units in parentheses. Submissions from outside the United States will feature metric followed by English units in parentheses. Target length of articles is 2,500 words; longer articles will be either edited for length or rejected.

First Submission. Initially, three double-spaced copies of the manuscript should be submitted to the managing editor. All accompanying tables, charts, and photo captions should be included.

Final Submission. Once manuscripts have been reviewed, accepted, and review comments have been addressed, the final manuscript should be submitted with one computer diskette, clearly labeled with the type and version of computer software, (MS Word or WordPerfect preferred), author's name(s), and document title as it appears on the manuscript. Paragraphs must be double-spaced and contain no indentations. Subheadings are desirable. Article titles should be short and explicit. The title, author's name(s), and the abstract (if peer reviewed) should be found at the top of the first page.

About the Author. A photo of the author, waist-up and outdoors should be sent with each final manuscript submittal. At the end of the manuscript, please include a one-sentence biography for each author with affiliation, location, mailing address, telephone number, and E-mail address.

Figures. If the figures contain graphics such as pie charts, maps, bar graphs, and so forth, authors can submit either of the following: (a) a laser printout of the graphics along with the manuscript—graphics saved of this type cannot be edited and they will be submitted to the publisher as camera-ready art; or (b) graphics as an object in the MS Word or WordPerfect file—hard copies of the graphics must be enclosed with the final manuscript.

Tables. Use the table functions in MS Word or WordPerfect to format tables, or include the data in an MS Excel spreadsheet so that we can create the chart without retyping the data. Hard copies showing how the final table should look must be enclosed with the final manuscript.

Literature Citations. Cite references parenthetically at the appropriate location in the text by author and year (Hendee 1995). List all references alphabetically by senior author, and in chronological order for multiple publications by the same author, at the end of the article. Do not use footnotes or endnotes. Citations should include full name(s) of authors, year of publication, title, source, place of publication, and publisher. Theses and unpublished manuscripts or occasional papers may be included sparingly.

Illustrations. All photographs, line drawings, maps, and graphs are designated as figures and must be keyed to the text. They should be consecutively numbered and identified with soft pencil on the reverse side. Photo captions should be listed at the very end of the manuscript and keyed to numbered photos. Glossy black-and-white photos or high resolution color slides, and photos are acceptable and will be printed in black and white in the journal.

Digital images. All digital photographs, maps, etc. must be provided at a resolution of 300 dpi and to the size (or larger) than it will be intended for use in the *IJW.* Either color (RGB or CMYK) or black and white files are acceptable. All images will be printed in the *IJW* as black and white. The digital files can either be saved in JPEG format and e-mailed to the Managing Editor, or saved in EPS format and submitted on a ZIP disk or CD to the Managing Editor.

Questions and Submissions. Direct all correspondence pertaining to manuscripts, including name, address, business phone, fax, and e-mail address of the lead author, to Chad P. Dawson, Managing Editor, *International Journal of Wilderness,* SUNY College of Environmental Science and Forestry, 211 Marshall Hall, One Forestry Drive, Syracuse, NY 13210, USA. Phone: 315-470-6567; fax: 315-470-6956; e-mail: cpdawson@esf.edu.