

INTERNATIONAL



# Journal of Wilderness



## In This Issue

- Global Wilderness Conservation
- Wilderness Simulation Models
- Public Viewpoint on Wilderness
- Arthur Carhart National Wilderness Training Center



AUGUST 2003

VOLUME 9, NUMBER 2



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

# Journal of Wilderness

AUGUST 2003

VOLUME 9, NUMBER 2

## FEATURES

### 3 EDITORIAL PERSPECTIVES

*The Politics of Wilderness*

*Moving to Use*

BY JOHN SHULTIS

### 4 SOUL OF THE WILDERNESS

*Support Is Building for Global Wilderness*

*Conservation*

BY CYRIL KORMOS and VANCE G. MARTIN

## STEWARDSHIP

### 9 *The Wilderness Simulation Model*

*A Historical Perspective*

BY JAN W. VAN WAGTENDONK

### 13 *Chief's Excellence in Wilderness Stewardship*

*Research Award*

### 14 *The Soul of Environmental Activists*

BY BARBARA McDONALD

### 18 *Celebrating a Decade of Service*

*The Arthur Carhart National Wilderness  
Training Center*

BY CONNIE G. MYERS

### 22 *Bill Worf Wins 2003 Corrigall Wilderness*

*Stewardship Award*

### 23 *On Writing Wilderness Ethics*

*Some Further Musings on the "Spirit Of Wildness"*

BY LAURA WATERMAN

## SCIENCE AND RESEARCH

### 27 *Is the Public Viewpoint of Wilderness Shifting?*

BY H. KEN CORDELL, MICHAEL A. TARRANT, and  
GARY T. GREEN

### 33 PERSPECTIVES FROM THE ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

*Natural Fire Regimes in Wilderness*

BY CAROL MILLER

## EDUCATION AND COMMUNICATION

### 34 *An Evaluation of Appalachian Trail Hikers' Knowledge of Minimum Impact Skills and Practices*

BY PETER NEWMAN, ROBERT MANNING, JIM BACON,  
ALAN GRAEFE and GERARD KYLE

## INTERNATIONAL PERSPECTIVES

### 39 *Bill Bainbridge of South Africa Receives Honorary Doctorate for Wilderness Work*

BY DRUMMOND DENSHAM

## WILDERNESS DIGEST

### 40 ANNOUNCEMENTS AND WILDERNESS CALENDAR

### 45 LETTERS TO THE EDITOR

*Response to "Don't Blame Science"*

BY JAMES GLOVER

### BOOK REVIEWS

### 46 *Natural Area Tourism: Ecology, Impacts and Management*

By David Newsome, Susan A. Moore, and  
Ross K. Dowling

REVIEW BY SANJAY K. NEPAL

### 46 *Sustainable Tourism in Protected Areas: Guidelines for Planning and Management*

by Paul Eagles, Stephen McCool, and Christopher  
Haynes

REVIEW BY DIANE KUEHN

### 47 *Wilderness Management: Stewardship and Protection of Resources and Values, (3rd ed.)*

by John C. Hendee and Chad P. Dawson

REVIEW BY RUPERT CUTLER

**FRONT COVER** image of a sunset over the wilderness area on Lake St. Lucia, South Africa. Photo courtesy of Ulf Doerner. **INSET PHOTO** of a Zulu woman creating mats out of sustainably harvested grass, St. Lucia area, South Africa. Photo courtesy of Vance G. Martin.

# 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.

## EDITORIAL BOARD

Alan W. Ewert, Indiana University, Bloomington, Ind., USA  
Vance G. Martin, WILD Foundation, Ojai, Calif., USA  
Alan Watson, Aldo Leopold Wilderness Research Institute, Missoula, Mont., USA  
John Shultis, University of Northern British Columbia, Prince George, B.C., Canada  
Steve Hollenhorst, University of Idaho, Moscow, Idaho, USA  
Wayne A. Freimund, University of Montana, Missoula, Mont., USA  
Rebecca Oreskes, White Mountain National Forest, Gorham, N.H., USA

## EDITOR-IN-CHIEF

John C. Hendee, Professor Emeritus, University of Idaho Wilderness Research Center, Moscow, Idaho, USA

## MANAGING EDITOR

Chad P. Dawson, SUNY College of Environmental Science and Forestry, Syracuse, N.Y., USA

## ASSOCIATE EDITORS—INTERNATIONAL

Gordon Cessford, *Department of Conservation, Wellington, New Zealand*; Karen Fox, *University of Alberta, Edmonton, Alberta, Canada*; Andrew Muir, *Wilderness Foundation Eastern Cape, South Africa*; Ian Player, *South Africa National Parks Board and The Wilderness Foundation, Howick, Natal, Republic of South Africa*; Vicki A. M. Sahanatien, *Fundy National Park, Alma, Canada*; Won Sop Shin, *Chungbuk National University, Chungbuk, Korea*; Anna-Liisa Sippola, *University of Lapland, Rovaniemi, Finland*; Franco Zunino, *Associazione Italiana per la Wilderness, Murialdo, Italy*.

## ASSOCIATE EDITORS—UNITED STATES

Greg Aplet, *The Wilderness Society, Denver, Colo.*; David Cole, *Aldo Leopold Wilderness Research Institute, Missoula, Mont.*; John Daigle, *University of Maine, Orono, Maine*; Don Fisher, *USFS, Washington D.C.*; Lewis Glenn, *Outward Bound USA, Garrison, N.Y.*; Glenn Haas, *Colorado State University, Fort Collins, Colo.*; Troy Hall, *University of Idaho, Moscow, Idaho*; William Hammit, *Clemson University, Clemson, S.C.*; Greg Hansen, *U.S. Forest Service, Mesa, Ariz.*; Dave Harmon, *Bureau of Land Management, Portland, Oreg.*; Bill Hendricks, *California Polytechnic State University, San Luis Obispo, Calif.*; Ed Krumpke, *University of Idaho, Moscow, Idaho*; Jim Mahoney, *Bureau of Land Management, Sierra Vista, Ariz.*; Bob Manning, *University of Vermont, Burlington, Vt.*; Jeffrey Marion, *Virginia Polytechnic Institute, Blacksburg, Va.*; Leo McAvoy, *University of Minnesota, Minneapolis, Minn.*; Michael McCloskey, *Sierra Club*; Christopher Monz, *Sterling College, Craftsbury Common, Vt.*; Connie Myers, *Arthur Carhart Wilderness Training Center, Missoula, Mont.*; Roderick Nash, *University of California, Santa Barbara, Calif.*; David Ostergren, *Northern Arizona University, Flagstaff, Ariz.*; Marilyn Riley, *Wilderness Transitions Inc., Sausalito, Calif.*; Joe Roggenbuck, *Virginia Polytechnic Institute, Blacksburg, Va.*; Holmes Rolston III, *Colorado State University, Ft. Collins, Colo.*; Susan Sater, *U.S. Forest Service, Portland, Oreg.*; Tod Schimelpfenig, *National Outdoor Leadership School, Lander, Wyo.*; Rudy Schuster, *SUNY-ESF, Syracuse, N.Y.*; Elizabeth Thorndike, *Cornell University, Ithaca, N.Y.*; Jay Watson, *The Wilderness Society, San Francisco, Calif.*; Dave White, *Arizona State University, Tempe, Ariz.*

*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, 320 Bray Hall, One Forestry Drive, Syracuse, N.Y. 13210-2787, USA. Telephone: (315) 470-6567. Fax: (315) 470-6535. E-mail: cpdawson@esf.edu.

Business Management and Subscriptions: WILD Foundation, P.O. Box 1380, Ojai, CA 93024, USA. Telephone: (805) 640-0390. 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.

All materials printed in the *International Journal of Wilderness*, copyright © 2003 by the International Wilderness Leadership (WILD) Foundation. Individuals, and nonprofit libraries acting for them, are permitted to make fair use of material from the journal. 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](http://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 Leadership School (South Africa)

# The Politics of Wilderness

## *Moving to Use*

BY JOHN SHULTIS

Is there a growing schism between the public and political view of wilderness? As Cordell, Tarrant and Green note in their article in this issue of the *IJW*, American residents seem to be far more supportive of the preservation rather than use function of protected areas, including and perhaps especially in wilderness. Numerous public surveys in other Western nations (e.g., Canada) also demonstrate the primacy of the nonuse values of wilderness. Interestingly, the tourism function of protected areas is often least valued among the public, although the same is not true for many politicians.


Indeed, this public sentiment runs counter to the current “business model” of wilderness management currently in vogue in many Western nations. The rise of neoconservative economic doctrines among most Western political parties and publics has led to significantly decreased government spending. Government revenues are down as well, due to decreased individual and corporate taxes. Some agencies that manage wilderness have had to increase revenue generation to make up for these losses. As a result, user fees have become de rigueur in some protected area agencies and sites. This is an interesting paradox: The public generally supports user fees in wilderness areas, yet also believe that non-use values (e.g., existence or bequest values) should receive greatest attention in wilderness management. Thus, in a (neoconservative) political sense, there seems to be a shift toward the primacy of the use function—particularly tourism—in all forms of protected areas, including wilderness. At the same time, the public is most supportive of the preservation function of protected areas.

Where will this increasing split between political support for use functions and public support for preservation functions lead us? On the one hand, the focus on revenue generation demonstrates that politicians are now aware of the economic impact of wilderness on its surrounding

region. This increased awareness of the significance of the economic benefits of protected areas may lead to a heightened interest in the creation of new protected areas and give land management agencies more political clout.

On the other hand, the increasing focus on use values may have less salubrious consequences for wilderness and wilderness users in the long term. If use functions (i.e., visits by recreationists or tourists) become

increasingly dominant, it becomes increasingly difficult to limit ecological impacts (see book reviews). An increased commercialization of wilderness and the wilderness experience may also proceed in tandem with increased revenues. Neither outcome would aid the ecological integrity of protected lands.

Developing nations, as noted by the Kormos and Martin article, also tend to rely on the revenue-generation function of protected areas to create new protected areas. In the short term, the international momentum to create new protected areas for tourism purposes may indirectly increase conservation of wilderness landscapes. But it may also mean that wilderness advocates must work harder to champion the ecological benefits of wilderness preservation. In the long term, it may be counterproductive to allow use functions to dominate wilderness management; ultimately, long-term preservation must prevail as the dominant function. 

JOHN SHULTIS is an associate professor at the University of Northern British Columbia, Prince George, B.C., Canada and an *IJW* editor. E-mail [shultis@unbc.ca](mailto:shultis@unbc.ca).



Article author John Shultis.



# Support Is Building for Global Wilderness Conservation

BY CYRIL KORMOS and VANCE G. MARTIN



Authors Vance G. Martin (left) and Cyril Kormos (right).

Wilderness conservation has always been a contentious issue, even more than the creation of national parks or other protected areas. Many reasons account for this reality, including a negative response by some development advocates to the idea of leaving wildlands essentially untouched, the fact that wilderness is sometimes misperceived as being anti-people, or that it is mistakenly regarded as a distraction from what are considered to be more pressing sustainable development concerns.

Despite these historical objections, new evidence in support of wilderness conservation makes us optimistic. In this article we review some recent information documenting wilderness values and demonstrating its expanding, practical appeal in developing as well as developed nations. This new information supports the growing idea that wilderness

protection, through very large parks that include de facto wilderness within their boundaries and other explicit wilderness designations, is viable and valuable. Positive change for global wilderness is occurring. In support of this development, the following is a summary of some new wilderness initiatives and information, beginning with an overview of some important prowilderness actions around the globe.

## New International Wilderness Conservation Initiatives

The government of Gabon announced its decision at the World Summit on Sustainable Development (WSSD) in September 2002 to set aside 10% of its land surface in a new national park system covering 2.6 million ha (6.4 million acres). This decision is remarkable because of the size of the proposed system, much of which is substantially intact rain-forest ecosystem. It is also remarkable for its economic implications. Recognizing that oil revenues in Gabon are declining, President Bongo has chosen to focus on conservation and tourism as sources of revenue, rather than turning to logging for a short-term fix. Also important is the strength and diversity of the coalition behind the initiative. Besides the big NGOs one would expect and whom we applaud—Conservation International (CI), Wildlife Conservation Society, World Wildlife Fund (WWF)—also working closely with the government of Gabon and local and regional NGOs is the U.S. administration, much criticized for its stance on environmental issues. Secretary of State Colin Powell and two of his assistant secretaries visited Gabon, as well as Republican members of The WILD Foundation's Congressional Advisory Committee. As a result, at the WSSD in Johannesburg, Secretary Powell committed U.S. funding and expertise to Gabon and a wider Congo Basin Initiative. Additional congressional hearings

have been held, and a further appropriation is being considered.

Similar to the Gabon initiative is the government of Suriname's decision in 1998 to set aside 1.6 million ha (4 million acres) of pristine tropical rain forest as the Central Suriname Nature Reserve (CSNR), bringing the nation's protected area to 10% of its land surface. Suriname's was also a decision to forego logging and other extractive industry revenue in favor of a policy of conservation-based income. The CSNR was established through a joint venture between the government of Suriname, CI, the Global Environment Facility (GEF), and the United Nations Development Programme. The CSNR is now a World Heritage site, and a trust fund has been established for its long-term management.

Also announced at the WSSD was a major new Amazonian initiative by the government of Brazil in cooperation with the World Bank, the GEF, and WWF. This initiative, launched with the creation of the largest park in the world (the almost 4-million-ha [10-million acres] Tumucumaque National Park), will establish 50 million ha (124 million acres) of new federal protected areas over the next 10 years. The Tumucumaque National Park is especially important because it protects one of the last roadless areas in the Brazilian Amazon, and one of the wildest parts of the planet, as de facto wilderness.

Wilderness conservation is also making strides in southern Africa, in particular with transboundary protected areas. Since the 1997 creation of the first official transfrontier park in Africa, the Kgalagadi Transfrontier Park between Botswana and South Africa, several major transboundary projects have gained momentum. Among them is the Great Limpopo Transfrontier Park, officially created in 2002. This 3.5-million-ha (8.6-mil-



Figure 1—Futi Channel, a wetland area linking southern Mozambique and South Africa. Photo by J. Culverwell.

lion-acre) area encompasses Kruger National Park in South Africa, Gonarezhou National Park in Zimbabwe, and Limpopo National Park in Mozambique, thus potentially reopening migratory routes for several large mammal species. In an even more recent initiative, South Africa, Swaziland, and Mozambique began working toward establishing a park linking their countries.

Another initiative in South Africa will expand the Baviaanskloof Wilderness Area to create a larger Baviaanskloof Mega-Wilderness Complex. This proposal, launched at the 7th World Wilderness Congress (WWC) in 2001, is critical to protecting the biodiversity of the area. Once again, it reflects a strong commitment among local governments, NGOs, and international organizations, respectively the Eastern Cape provincial government, the Wilderness Foundation (South Africa), The WILD Foundation, CI, and the GEF (Martin and Muir in press).

This list of projects conserving global wilderness is not comprehensive; it

ignores such important initiatives as the Palmyra Atoll in the South Pacific; the Cardamom Mountains in Cambodia; a large debt-for-nature swap and a new park in the Cordillera Azul in Peru; the Adams, Paparoa, and Rakiura (new wilderness) designations in New Zealand; and the Spergeibit Wilderness National Park in Namibia, just to name a few.

These projects and this list are impressive. They represent progress and they feed our optimism. These new wild parks and reserves represent a fraction of what needs to be done globally to protect the planet's last wild places, but they are evidence that conservation can be at the heart of national economic development strategies, offering an alternative to traditional extractive industries.

## How Much Global Wilderness Is Left?

There have been four major assessments of how much global wilderness is left, each varying in its criteria for determining what would qualify and each coming up with a different estimate of how much wilderness is left.



Figure 2—Waterway and dense tropical rain forest of Gabon. Photo by Vance G. Martin.

Collectively they provide critical information about the world's remaining wild area.

The first global wilderness assessment was the 1987 wilderness survey by McCloskey and Spaulding, presented at the 4th WWC in the United States (McCloskey and Spaulding 1988). That Sierra Club survey, entitled "A Reconnaissance-Level Inventory of World Wilderness Areas," analyzed jet navigation charts to identify areas larger than 400,000 ha (161,943 acres) with no permanent human infrastructure. The study concluded that approximately one-third of the planet's land surface was still in a wilderness state. The author's explicit intent was to provide an accurate estimate that would provide the basis for further study.

Building on the McCloskey and Spaulding survey, the 1994 study by Hannah et al. published in *Ambio* produced a GIS map of global human disturbance in natural ecosystems. This study derived a Habitat Index,

and used a three-category scale—undisturbed, partially disturbed, and human dominated—to map the results. Undisturbed areas had primary vegetation and population densities lower than 10 people per sq. km. (and under one person per sq. km for arid/semiarid and tundra communities). Partially disturbed areas had secondary, but naturally regenerating vegetation and at least some agricultural development. Human-dominated areas were urban or agricultural environments. The minimum units mapped were 40,000 ha (98,000 acres). Mixed units were mapped using the dominant land cover, and aggregated into 100,000-ha (247,000-acre) units. The survey was called "preliminary" because some of the data were incomplete or inconsistent, but the study nonetheless produced interesting findings: approximately 52% of the Earth's surface was undisturbed, 24% was partially disturbed, and 24% was human dominated. Removing "rock, ice, and barren land," the study found

that 27% was undisturbed, 37% partially disturbed, and 36% human dominated.

CI's assessment of the planet's remaining wilderness is summarized in its recent book *Wilderness: Earth's Last Wild Places* (Mittermeier et al. 2002). Three criteria were used to determine what areas qualified. The first was size—a threshold was set at 1 million ha (2.47 million acres). The second criterion was intactness—the area had to have 70% of its habitat intact and had to maintain "intact faunal assemblages" of mammals and birds, and in particular large predators. Finally, the study used a population criterion, applying a threshold of fewer than five people per sq. km. Based on these criteria, the study found that 46% of the planet qualified as remaining wilderness. Of the 37 areas studied, five were areas of high biodiversity and 11, called "mega-wilderness areas," were greater than 100 million ha (247 million acres).

The Wildlife Conservation Society's (WCS) study titled "The Human Footprint and the Last of the Wild" focused on four factors reflecting human influence on natural environments (Sanderson et al. 2002). The four criteria were population density, land transformation, human access (via roads or natural access points), and electrical power infrastructure (i.e., light visible by satellite). Scores were assigned for each factor and combined to generate a Human Influence Index rating. The results were then mapped. To determine what areas remained truly wild, the study then selected the areas in the top 10% in terms of wilderness in each biome. The result, according to this WCS analysis, was that 17% of the Earth's land surface remains wild.

Although the WCS result indicated much less remaining wild area than



CI's, the discrepancy is partially explained by WCS's exclusion of Antarctica from its analysis. With virtually no infrastructure, a very small human population, and 10% of the Earth's land surface, if Antarctica were included it would presumably raise the percentage of remaining wilderness to or near 27%. Moreover, CI's survey also conducted a second analysis using a lower population criterion (less than one person per sq. km) and an area that might more closely resemble WCS's top 10% wild areas. The result for this lower population density analysis was that 38.5% of the Earth's land surface qualified as wild. Viewed in this light, the WCS and CI studies produced more similar results.

These four studies are not directly comparable because of their different methods and criteria as to what constitutes remaining wildness. For example, as the authors of the WCS study point out, their analysis does not in fact measure actual human impact, but rather "suggests areas of influence where humans have more or less responsibility for biological outcomes" (Sanderson et al. 2002, p. 898). CI produced estimates of ecological intactness. But collectively, the studies and their differences in methods will guide future efforts. Further, all four studies indicate that significant wilderness remains, more than one might expect; at the same time, however, little of what remains is very far removed from human influence.

The window of opportunity to protect wilderness will therefore close quickly. As conveyed in the CI report (Mittermeier et al. 2002, pp. 34–39), the importance of these last wild places requires that we think beyond the usual, intensively managed national park model and consider larger conservation areas while we still can.

## How Much Are Wilderness Ecosystem Services Worth?

It is increasingly recognized that wilderness is valuable for the ecosystem services it provides (e.g., clean water and air, carbon sequestration, nutrient cycling, erosion control, flood control, etc.), and that these services have economic value that can be estimated. A seminal study by Costanza et al. (1997) published in *Nature* estimated the economic value of global ecosystem services by taking local assessments of ecosystem values and then extrapolating to a global scale. The result was an estimate ranging from \$16 to \$54 trillion (18 to 61 trillion in 2000 dollars), or an average of \$35 trillion (38 trillion in 2000 dollars).

As the Costanza's et al. study acknowledged, however, the assessment had built in several uncertainties. One was a lack of data for a number of biomes, including deserts, tundra, and croplands. Another was the uncer-

tainty inherent in attempting to extrapolate from local data to a global scale. A third issue was the fact that the methodologies used to determine the values of the various ecosystem services were all different. Finally, a fourth issue was that the study provided the gross value of ecosystem services—the economic benefits of conversion were not subtracted to provide an estimate of net economic benefits.

A more recent study published in *Science* (Balmford et al. 2002) titled "Economic Reasons for Conserving Wild Nature" and launched at the WSSD, sought to remedy these issues in the 1997 study. The new effort compared the benefits of protection versus the benefits of conversion as directly as possible, selecting for analysis five development projects where data were available both on the revenues generated by conversion as well as the value of the ecosystem goods and services provided by the intact habitat. The data included values for marketed and



Figure 3—Gabon has perhaps the largest population in the world of western lowland gorillas. Photo by Vance G. Martin.



---

All four studies indicate that significant wilderness remains, more than one might expect: at the same time, however, little of what remains is very far removed from human influence.

---

nonmarketed goods and services as well as local and global benefits. Furthermore, to ensure consistency, the study only compared data that were generated using the same methodologies for each particular good or service.


Across the five projects in four biomes that were evaluated, the study found that the total economic value of conversion was roughly half the total economic value of conservation. The study estimated that the cost of converting relatively intact habitats was approximately \$250 billion per year. Conversely, the study placed the cost of conservation (i.e., of establishing a comprehensive global terrestrial and marine protection system) at roughly \$45 billion a year, and estimated that a global protection system would provide services with a net value between \$4.4 and \$5.2 trillion a year. In other words, the study concluded that a global protected areas system would pay for itself 100 times over.

More research is needed to elaborate on these findings. As Balmford et al. (2002) indicated, they were only able to identify five case studies in four biomes where information was available on both conversion and ecosystem services values. On the other hand, the authors point out that their calculations would have to be off by a factor of 100 before the \$45-billion cost of a global protected areas

system became unjustifiable in strict economic terms, an unlikely event given their conservative approach. This study makes a very compelling case for conservation of intact habitats. Of course the social, cultural, and spiritual benefits of conserving remaining wilderness only adds to the economic benefits, and may be even more important in rallying support for particular areas.

## Conclusion

We believe that the wilderness concept will continue to gain momentum in coming years and as a result, that opportunities for large-scale conservation will continue to grow simultaneously with the need to protect and sustain such areas. We are also mindful that wilderness areas will continue to be under tremendous pressure, and that wilderness conservation will only succeed if it is a part of large-scale “sustainable development” discussions and action. By collaborating with the World Conservation Union (IUCN) and the World Commission on Protected Areas on a new Wilderness Task Force, we are working to ensure that wilderness questions are firmly on the international agenda in September 2003 at the World Parks Congress in Durban, South Africa, and that these discussions continue at the 8th WWC (likely in 2005). Maintaining an international

wilderness dialogue through these venues, and continuing progress in field projects, research, and grassroots initiatives, will ensure that the many socioeconomic, spiritual, and scientific values of wilderness are sustained in both developed and developing countries. 

## REFERENCES

- Balmford, Andrew, et al. 2002. Economic reasons for conserving wild nature. *Science* 297: 950–953.
- Costanza, Robert, et al. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387: 253–260.
- Hannah, Lee, et al. 1994. A preliminary inventory of human disturbance of world ecosystems. *Ambio* 23 (4–5): 246–250.
- Martin, Vance G. and Andrew Muir. In press. *Wilderness and Human Communities: Proceedings of the 7th World Wilderness Congress*, November 2001. Golden Colo.: Fulcrum Publishing.
- McCloskey, Michael J. and Heather Spaulding. 1988. A reconnaissance-level inventory of the wilderness remaining in the world. In Vance G. Martin and Partha Sarathy, eds, *For the Conservation of the Earth: Proceedings of the 4th World Wilderness Congress*, Sept. 11–18, 1987, Denver and Estes Park, Colo. Golden, Colo.: Fulcrum Publishing. p. 18–41.
- Mittermeier, Russell A., et al. 2002. *Wilderness: Earth's Last Wild Places*. Cemex, 19–54.
- Sanderson, Eric W., et al. 2002. The Human Footprint and the last of the wild. *BioScience* 52 (10): 891–904.

CYRIL KORMOS is vice president for policy of The WILD Foundation, joining WILD after six years at Conservation International, most recently as senior director for program management in the president's office. E-mail: [cyril@wild.org](mailto:cyril@wild.org).

VANCE G. MARTIN is president of The WILD Foundation, an executive editor and co-founder of the *International Journal of Wilderness*, and co-chair of the new Wilderness Task Force of the IUCN. E-mail: [vance@wild.org](mailto:vance@wild.org).

# The Wilderness Simulation Model

## *A Historical Perspective*

BY JAN W. VAN WAGTENDONK

### Introduction

Recent application of simulation modeling to wilderness and river settings (Daniel and Gimblett 2000; Gimblett et al. 2000, 2002) has revived interest in the Wilderness Simulation Model (WSM) first developed by Smith and Krutilla (1976) and based on an idea by Stankey (1972). Stankey hypothesized that visitors' satisfaction with a wilderness experience was inversely related to the number of encounters they had with members of other parties. Fisher and Krutilla (1972) conceptualized this idea into a model that established the optimum level of use in a wilderness area to be the point at which the incremental benefit of an additional party is just offset by the decrease in the benefits of the parties encountered. The practical application of this concept required that an empirical relationship between the benefits enjoyed during an outing and the number of parties encountered be measured and that a means for estimating encounters be developed. Numerous sociological studies were launched to examine the relationship between benefits and encounters, but, other than laborious fieldwork, no means existed for enumerating encounters.

In order to overcome this obstacle, researchers from Resources for the Future began to develop a computer model that would simulate visitor travel behavior in a wilderness and record encounters between parties. The WSM was a simulation program written by Heck and Webster (1973) in the General Purpose Simulation System language running on an IBM mainframe computer.

Visitor data required to run the model included weekly, daily, and hourly distributions of use; party-size distributions; and mode of travel mix. For example, small parties on horseback were distinguished from large hiking parties. Area information included the trail segments and campsites in

the network and the time it took parties of different sizes to hike or ride each trail segment in each direction. Finally, the various routes that might be taken were enumerated along with their probability of being selected. The WSM scheduled parties of different sizes and types to arrive on different weeks, days of the week, and hours of the day, assigning each party a route that included the trails over which they traveled and the campsites they used. The WSM recorded the number of encounters for each party, with whom each encounter occurred, the location of those encounters, and the types of encounters (meeting, overtaking, or camp). Output from the WSM included numerous tables showing encounters by party type, location, trip length, and total use level.

Prototype testing of the WSM was conducted on the Spanish Peaks Primitive Area (Smith and Krutilla 1976) and the Adirondack Forest Reserve (Smith and Headly 1975). Subsequently, the model was enhanced by Resources for the Future under contract with the U.S. Forest Service (Shechter 1975). This new WSM model was applied to the Desolation Wilderness in California (Shechter and Lucas 1978) and to the complex of wilderness areas surrounding and including Yosemite National Park (van Wagtenonk 1979). Modification of the WSM for river settings allowed it to be applied to the Green and Yampa Rivers in Dinosaur



Article author Jan van Wagtenonk. Photo by Don Barry.



**Figure 1**—The Yosemite Wilderness is located in the central Sierra Nevada, an area of granite peaks and glaciated valleys. Photo courtesy of the National Park Service.

Monument (Lime et al. 1978) and to the Colorado River in Grand Canyon National Park (Underhill et al. 1986). A final application of the WSM to a trail system was done by Potter and Manning (1984) on the Appalachian National Scenic Trail in Vermont. The studies related to Yosemite National Park are presented here as a case study to illustrate the process of using the WSM.

## Yosemite National Park

Simultaneous with the effort to apply the WSM to the Desolation Wilderness,

scientists and managers at Yosemite National Park began assembling the necessary information to run the WSM (van Wagtenonk 1979). The Yosemite Wilderness was designated in 1984 and encompasses 704,638 acres (281,855 ha) of the park (see Figure 1). Contiguous wilderness areas include the 112,227-acre (44,891-ha) Emigrant Wilderness on the Stanislaus National Forest, the 48,601-acre (19,440-ha) Hoover Wilderness on the Toiyabe and Inyo National Forests, and the 93,958-acre (37,583-ha) Ansel Adams Wilderness on the Inyo and Sierra National Forests. There are 55 trailheads with 695 miles (1,112 km) of trail and 375 campsites in the Yosemite Wilderness. An additional 46 trailheads feed 416 miles (666 km) of trail and 197 campsites on Forest Service wilderness areas adjacent to the park. Use in the Yosemite Wilderness in 1975 was 219,000 visitor-nights (van Wagtenonk 1981).

Wilderness use in the Yosemite complex has been regulated through the use of wilderness permits since

1971. Use permits were the primary data source for the WSM (van Wagtenonk 1978). Party size, mode of travel, arrival patterns, and the zones through which a party planned to travel were all obtained from the permit. Zone information was converted into routes using methods described by van Wagtenonk (1978). Permits avoided the costs associated with visitor surveys and allowed all routes actually recorded to be simulated rather than just a sample of possible routes. The validity of the information on the permits and the travel behavior of parties that did not get permits were determined. In Yosemite, van Wagtenonk and Benedict (1980a) found that 92% of the parties had permits and that 62% of them made changes to their trips. The average trip was shortened by a half day and spatial changes were common.

A study was conducted in Yosemite to determine trail travel times for parties on 1-mile trail segments (van Wagtenonk and Benedict 1980b) as input to the WSM. It took an average of 34.8 minutes for backpacking parties, 36.4 minutes for day-hiking parties, and 27.3 minutes for horse-riding parties to travel all the sample trail segments (see Figure 2). Party size was not significant for all three types of parties, and slope-direction class was significant only for backpacking parties. For these parties, average times for uphill travel were greater than downhill travel, and time increased as slope increased.

Modifications to the WSM made from the Desolation Wilderness study allowed the Yosemite study to focus on trailheads, campsite encounters, and campsite use levels. The decision to concentrate on campsites was based on work by Absher and Lee (1981) that indicated the sociological effect of trail encounters depended more on the



**Figure 2**—Backpackers and day hikers are the most common type of visitor in the Yosemite Wilderness. Photo courtesy of Yosemitefun.com.



behavior of the encountered party and the location of the encounter than on the number of encounters (see Figure 3). A single encounter with an ill-behaving party could have a much greater impact than meeting numerous parties exhibiting acceptable behavior. In areas where people expected to meet others, the impact of an encounter was less than in areas where they were not expected (see Figure 4). Trailhead quotas were selected by Yosemite managers as the preferred method for rationing use because controls at the entry points allowed maximum freedom to visitors in the interior of the area (van Wagtenonk and Coho 1986).

The 20,000 wilderness permits issued in 1973 were used for the base-case simulation because travel behavior that year was not limited; use in subsequent years might have been affected after use limits were imposed (van Wagtenonk 1981). Two visitor use levels and two trailhead allocation patterns were examined and compared to the base case. The use levels were a 50% increase from the base case and a 50% decrease. The first trailhead allocation scenario was based on daily entry quotas derived from a computer program (van Wagtenonk and Coho 1986) that compared actual use levels in zones to desired levels and reallocated entries until no zone exceeded its limit. Desired zone use limits were based on van Wagtenonk (1986). The second trailhead scenario rounded the daily entry quotas up to the nearest number divisible by five.

Across all WSM simulations, the relationship between camp encounters per party-night and party-nights was positive and linear (see Figure 5). The resulting number of encounters was less than half that reported for the Desolation Wilderness. Two reasons accounted for this difference. First, a



**Figure 3—Encounters between stock parties and hikers can be positive if both groups are perceived as behaving properly. Photo by Scott Carpenter.**

greater number of trailheads gave visitors more opportunities to disperse and, consequently, experience fewer encounters per party-night. Second, the wilderness permits provided thousands of potential routes compared to only hundreds from the diaries used for the Desolation Wilderness. This diversity of routes dispersed parties during the WSM simulations, resulting in fewer encounters per party-night.

Trailhead entries for the base-case simulations ranged from one person per day through the most lightly used trailheads to over 100 people per day through the three most popular trailheads. The simulations based on the trailhead visitor quotas reduced the peaks in use both temporally and spatially, but did result in increased visitor encounter levels in the more sparsely used areas. These results were similar to the results from the Desolation Wilderness, as would be expected when visitor use is dispersed.

Combined with the trailhead quota program, the simulation results pro-

vided the information needed by managers to implement quotas for the Yosemite complex of wilderness areas. In that sense, the simulator was a success. However, the cost of running simulations on a remote mainframe computer was expensive and limited the feasibility of further experiments.

## Future Applications

The WSM has proven its usefulness in applications from simple, linear river systems to large, heavily used wilderness areas. All of these studies showed that trail and camp encounters were directly related to total visitor




**Figure 4—Camping where no one else is expected to be adds to one's wilderness experience. Photo by Kent van Wagtenonk.**

The WSM has proven its usefulness in applications from simple, linear river systems to large, heavily used wilderness areas. All of these studies showed that trail and camp encounters were directly related to total visitor use levels and that management alternatives that reduce visitor use will lead to reduced user-user encounter levels.

use levels and that management alternatives that reduce visitor use will lead to reduced user-user encounter levels. In addition, the WSM was effective for evaluating the temporal and spatial effects of various trailhead allocation patterns that were then applied to a complex of wilderness areas in California.

Recent advances in computer technology and behavioral science have rendered the WSM out of date. As early as 1985, Rowell (1986) presented a version of the WSM that ran on a personal computer and had the capability to be used interactively to geographically display outputs. The concepts developed by Rowell have been incorporated into newer models.

Wang and Manning (1999) used an object-oriented dynamic simulation

package to model carriage-road use in Acadia National Park in Maine. Lawson et al. (2002) applied the same model to simulate user encounters at Arches National Park in Utah. A GIS was used to derive routes for the model, but graphical output was not part of the model. Gimblett et al. (2000) combined object-oriented technology with geo-referenced temporal data to dynamically simulate visitor behavior in a heavily used natural setting in Sedona, Arizona. Output from the simulator can be displayed in graphs and as two-dimensional or three-dimensional maps. Using an autonomous agent-based model, Daniel and Gimblett (2000) simulated river trips on the Colorado River in the Grand Canyon. Gimblett et al. (2002) plan to apply their model to derive patterns of dispersed use in the Ansel Adams and John Muir Wilderness areas in California, returning to one of the areas where the WSM was first applied. These innovative new models show how far the science of simulating wilderness has come in less than three decades. The old WSM is probably gone, but not forgotten. 

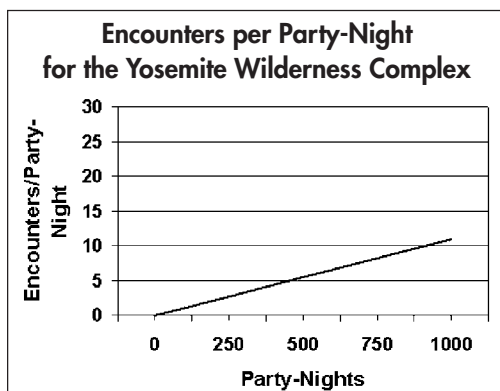


Figure 5—Camp encounters as a function of party-night ( $Y = -0.02 + 0.011X$ ) in the Yosemite Wilderness complex ( $R^2 = 0.97$ ).

## REFERENCES

Absher, J. D., and R. G. Lee. 1981. Density as an incomplete cause of crowding in backcountry settings. *Leisure Science* 4 (3): 231–248.

- Daniel, T. C., and R. Gimblett. 2000. Autonomous agents in the park: An introduction to the Grand Canyon river trip simulation model. *IJW* 6 (3): 39–43.
- Fisher, A. C., and J. V. Krutilla. 1972. Determination of optimal capacity of resource-based recreation facilities. *Natural Resources Journal* 12 (3): 417–444.
- Gimblett, R., T. Daniel, and M. J. Meitner. 2000. An individual-based modeling approach to simulating recreation use in wilderness settings. In D. N. Cole, S. F. McCool, W. T. Borrie, and J. O'Loughlin, *Wilderness Science in a Time of Change Conference—Volume 4: Wilderness Visitors, Experiences, and Visitor Management*, May 23–27, 1999, Missoula, Mont. Proceedings RMRS-P-15-VOL-4. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 99–106.
- Gimblett, R., J. Lynch, T. Daniel, L. Ribes, and G. Oye. 2002. Deriving artificial models of visitor behavior from dispersed patterns of use in Sierra Nevada wilderness. In A. Arnberger, C. Brandenburg, and A. Muhar, eds, *Conference Proceedings: Monitoring and Management of Visitor Flows in Recreational and Protected Areas*, January 30–February 2, 2002, Vienna, Austria. Vienna: Bodenkultur University Vienna, 180–186.
- Heck, N. A., and D. B. Webster. 1973. *Wilderness Area Simulation Model: User's Manual*. Washington, D.C.: IBM and Resources for the Future. N. T. I. S. Accession No. PB-233 364/9/INW.
- Lawson, S., R. Manning, W. Valliere, and B. Wang. 2002. Using simulation modeling to facilitate proactive monitoring and adaptive management of social carrying capacity in Arches National Park, Utah, USA. In A. Arnberger, C. Brandenburg, and A. Muhar, eds, *Conference Proceedings: Monitoring and Management of Visitor Flows in Recreational and Protected Areas*, January 30–February 2, 2002: Vienna, Austria. Vienna: Bodenkultur University Vienna, 205–210.
- Lime, D. W.; D. H. Anderson, and S. F. McCool. 1978. An application of the simulator to a river setting. In M. Shechter, and R. C. Lucas, eds, *Simulation of Recreational Use for Park and Wilderness Management*. Baltimore, Md.: Johns Hopkins University Press, chapter 9.
- Potter, F. I., and R. E. Manning. 1984. Application of the wilderness travel simulation model to the Appalachian Trail in Vermont. *Environmental Management* 8 (6): 543–550.
- Rowell, A. L. 1986. A wilderness travel simulation model with graphic presentation of trail data. In R. C. Lucas, comp., *Proceedings—National Wilderness Research Conference: Current Research*, July 23–26, 1985, Fort

- Collins, Colo. Gen. Tech Rep. INT-212. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, 478-482.
- Shechter, M. 1975. *Simulation Model of Wilderness-Area Use: User's Manual and Program Documentation*. Washington, D.C.: Resources for the Future. N. T. I. S. Accession No. PB-251 635/9/INW.
- Shechter, M., and R. C. Lucas. 1978. *Simulation of Recreational Use for Park and Wilderness Management*. Baltimore, Md.: Johns Hopkins University Press.
- Smith, V. K., and R. L. Headly. 1975. The use of computer simulation models in wilderness management: A case study of the Adirondack Forest Reserve. In S. Ladany, ed., *Management Science Applications to Leisure Time*. Amsterdam: North-Holland Publications.
- Smith, V. K., and J. V. Krutilla. 1976. *Structure and properties of a wilderness travel simulator: An application to the Spanish Peaks Area*. Baltimore, Md.: Johns Hopkins University Press.
- Stankey, G. H. 1972. A strategy for the definition and management of wilderness quality. In J. V. Krutilla, ed., *Natural Environments: Studies in Theoretical and Applied Analysis*. Baltimore, Md.: Johns Hopkins University Press, 88-114.
- Underhill, A. H., A. B. Xaba, and R. E. Borkan. 1986. The wilderness simulation model applied to Colorado River boating in Grand Canyon National Park, USA. *Environmental Management* 10 (3): 367-374.
- van Wagtendonk, J. W. 1978. Using wilderness permits to obtain route information. In M. Shechter, and R. C. Lucas, eds., *Simulation of Recreational Use for Park and Wilderness Management*. Baltimore, Md.: Johns Hopkins University Press.
- . 1979. Use of a wilderness simulator for management decisions. In R. M. Linn, ed., *Proceedings of the First Conference on Scientific Research in the National Parks*, vol. 1; November 9-12, 1976; New Orleans, La. Transactions and Proceedings Series 5. Washington, D.C.: U.S. Department of the Interior, National Park Service, pages 1039-1040.
- . 1981. The effect of use limits on backcountry visitation trends in Yosemite National Park. *Leisure Science* 4 (3) : 311-323.
- . 1986. The determination of carrying capacities for the Yosemite Wilderness. In R. C. Lucas, comp. *Proceedings—National Wilderness Research Conference: Current Research*, July 23-26, 1985; Fort Collins, Colo. Gen. Tech Rep. INT-212. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, 456-461.
- van Wagtendonk, J. W., and J. M. Benedict. 1980a. Wilderness permit compliance and validity. *Journal of Forestry* 78 (1): 399-401.
- . 1980b. Travel time variation on backcountry trails. *Journal of Leisure Research* 12 (2): 99-106.
- van Wagtendonk, J. W., and P. R. Coho. 1986. Trailhead quotas: Rationing use to keep wilderness wild. *Journal of Forestry* 84 (11): 22-24.
- Wang, B., and R. E. Manning. 1999. Computer simulation modeling for recreation management: A study on carriage road use in Acadia National Park, Maine, USA. *Environmental Management* 23 (2): 193-203.

JAN W. VAN WAGTENDONK is a research forester with the U.S. Geological Survey, Western Ecological Research Center, Yosemite Field Station, El Portal, CA 95318, USA. Phone: (209) 379-1306. E-mail: jan\_van\_wagtendonk@usgs.gov.

## Chief's Excellence in Wilderness Stewardship Research Award

Dr. Jan van Wagtendonk has been selected as this year's recipient of this research award to recognize his long-term commitment and accomplishments with direct application to wilderness stewardship.

Dr. van Wagtendonk, who works for the U.S. Geological Survey, and is stationed at Yosemite National Park in California, has been the leading researcher and advocate for wilderness science in the Department of the Interior for over 30 years. A highly productive research career has led to involvement in developing wilderness fire management and visitor use management programs

for Yosemite National Park that have contributed substantially to interagency wilderness management programs in the Sierra Nevada. Jan has worked across boundaries enthusiastically, energetically, and effectively with surrounding National Forest wilderness managers. His work on fuels dynamics, fire prescriptions, remote sensing, and GIS applications to fire management have made major contributions to wilderness fire programs both in the Sierra Nevada and across the country. The *IJW* editorial board is pleased to jointly recognize Dr. van Wagtendonk for this award.



# The Soul of Environmental Activists

BY BARBARA McDONALD



Article author Barbara McDonald.

Recently in the Soul of the Wilderness segment, one *IJW* editor called soul the “experiences, feelings, and values behind the information presented” about wilderness (Martin 2002, p. 3). Soul in this sense is not limited to wilderness advocates. Most environmental activists have special feelings for the natural environment. Robert Perschel of The Wilderness Society recently

observed that “we need to find a way to bring spirit and values and ethics and religion into our lives, into our work, and into our contact with the entire landscape—not just those places that are protected forever as wilderness” (Perschel 2002, p. 150). Spirit and soul, although intangible, may enhance environmental experiences at all landscape scales and may play an important, but transparent, role in the lives of committed environmental activists.

The interrelationship of environment and spirit is not a surprise to most of us. We have our own personal experience, and we have a growing literature on religious and spiritual orientations to the environment. This literature is largely historical, anecdotal, or philosophical. Most of the literature explores the environmental attitudes and actions that emerge from religious or spiritual contexts, such as Christianity, Buddhism, Islam, or American Indian spiritualities (Gottlieb 1996; Kearns 1996; Shultz, Zelenzy, and Dalrymple, 2000). Spirituality and soul, however, may also emanate from environmental experiences, attitude, and action (Gair 1999; Johnson 2002; Leenders and Henderson 1991; Shaw and Wendl-Berry 1999; Stringer and McAvoy 1992).

The idea that soul is discovered as people become engaged in environmental experience and action is what inspired my recent study into the spirituality of highly committed environmentalists. I interviewed 18 individuals who were engaged in a variety of action on behalf of the environment. At first I asked general, open-ended questions of these activists. The questions became more focused as I integrated the framework provided by Joel Kovel (1991) in his five essays on spirit. Kovel presented an interrelated set of experiences that have the potential to bring soul into one’s life. These soul experiences are grounded in the direct experience of a vital force, spirit, God, or in experiencing vital spirit through other forms or beings. When such personal experiences are imbued with deep meaning, they may create a desire to take action that leads one to a spiritual path. I found, as all who have explored the phenomenon of spirituality have found, that language inhibits the full expression of those deep meanings. With this limitation in mind, here are some of the soul and spiritual experiences of highly committed environmentalists.

## The Direct Experience of the Vital Force

Kovel wrote that spirituality is rooted in the “direct apprehension of a vital and material force pervading the entire universe” (1991, p. 22). The direct personal experience of the vital force does not require any mediating form or being, but it may involve other earthly forms or beings (see Figure 1). Viktor Frankl (2000) noted that even Samuel mistook God’s call for the voice of a human: “If Samuel failed to recognize that the call came to him from transcendence, how much more difficult it must be for an ordinary person to discern the transcendent character of the voice he perceives through his conscience” (p. 62). I found that direct experience of the vital force was uncommon for these environmentalists, as it may be in most human experience.

Even though such direct experience is uncommon, Steve, a 52-year-old environmental education center director, described

a transcendent experience that changed the course of his life. His experience demonstrates vividly what a direct experience of the vital force may be like. After a particularly long string of what he considered failures, Steve spent months alone in an isolated backcountry cabin, trying to figure out where he was going with his life:

On this particular evening I came up and I stood on that stump and it began to snow, and I closed my eyes and I could feel kind of cool-like snowflakes falling, and I remember them specifically touching my eyelids and became sort of absorbed in the sounds of the water coming out of the mountain and was completely absorbed. I was totally outside of myself and lost all track of time. At some point, I consciously became aware of my pulse, and I remember experiencing the sense of amazement that I had become so calm and so quiet that I could actually feel not just my heart beating, but I could feel the blood moving through my body. ... At some point I realized what I was experiencing. The movement inside of my body wasn't blood it was energy, and it wasn't coming from me it was going through me and it was coming out of the earth through the stump right up through my feet and through my entire being ... I remember having a conscious thought that this is just energy moving through me. The conscious awareness was of being absolutely connected to the Earth. I was just another tree standing on the side of the mountain, just like the stone on the bank of the creek, just like a grain of soil, just like the snowflakes falling on my feet and shoulders.

Valerie, a 51-year-old environmental educator, reported that she sometimes directly experiences a power greater than the human experience: "Almost my whole life I've had just flashes I used to call them, this absolute knowing or intuition, gut ... it was more this absolute instant of clarity where I felt that I knew what I needed to do or what I needed to say or just this immense peace and trust that this is right. ... It was not about me, it was something about me was opened to that force that is greater than us."

### Experiencing Vital Force in the World

In contrast to the direct experience of the vital force, this force may be experienced as, or through, a form or being. Examples include an inspirational sunrise, the beauty of a flower, the magic and wonder of a newborn human, or the anonymous kindness of another person (see Figure 2). For most of these environmentalists, the vital force was experienced in or through the natural world. Joyce, a 46-year-old environmental singer-songwriter, said that she finds God in "steelhead salmon and salt marshes." When Joyce explained that "we all carry that of God within us," she meant not just humans, but all of the Earth and its life. Ted, a 64-year-old volunteer creator of a Christian environmental program, was "converted" as he said, to environmentalism in his 50s when he saw a flower whose beauty "made my heart stop." Douglas, a 69-year-old environmental consultant who has spent his lifetime creating trails, said, "I'm not involved [with any religion].



Figure 1—The interrelationship between the environment and spirituality is well recognized. Photo by Barbara McDonald.



Figure 2—Individuals experience vital force through forms and beings in the natural world. Photo by Barbara McDonald.

I believe in God if that's what you mean. Anyone who works with the forest has to, if they are honest. I believe in evolution of course, but God made evolution."

Ellen, an 82-year-old Catholic nun, reported that she had struggled for years with the dichotomy between the sacred and the secular. After a lot of reading, studying, and learning, Ellen observed: "It finally settled all of [my] struggles about this dichotomy between the sacred and the secular, and made me realize that the universe is God's primary revelation before any scriptures, and nature itself is a showing of the divinity."

Many of the environmentalists expressed the belief that the Earth is God's creation, and that because it is, people have a responsibility to take care of it. These individuals observed that care for



**Figure 3—Although environmentalists work most often in urban and suburban settings, they feel most spiritually connected in wilderness. Photo by Barbara McDonald.**

the Earth is respect for divine creation. Vicky, a 51-year-old director of an environmental education center, and Terry, a 57-year-old wilderness consultant, mentioned their affinity for the Earth-based spirituality of the American Indians. Vicky said: “I am a great admirer of the Native Americans and their attitude toward the environment and the way that it was tied up in their religious beliefs. To me a lot of those things are one and the same. Respect for life or any other type of life, whether it’s bacterial or plant life or animal life, to me is critical.”

### **The Meaning of Vital Force**

Following their experiences of the vital force, whether directly or through the natural world, these individuals reported comprehending a greater meaning in their life. The most powerful meaning to emerge for them was that we are all connected—humans, other animals, and the Earth—and that humans have a responsibility to these others. Valerie, for example, noted that “we do not have dominion over anything but ourselves, and I think it’s our job to understand our place in nature. We are a part of it.” Pasi, a 29-year-old community activist, said that environmentalism “is sustaining life in whatever form it takes, whether it’s plant, human, a tree, an animal, or whatever. It’s all tied together, it’s all connected.”

cies to go extinct, we are not doing the environment any good for ourselves, and, in the long run, we are hurting ourselves one way or another.” Stewardship was also indicated as an approach to take on behalf of the Earth itself and its creatures. Most of the environmentalists said that nature has a right to exist independent of any human purpose, and Dave, a 66-year-old environmental consultant, said that he was close to even feeling that “rocks have rights.”

### **Spirit, Desire, and Environmental Activism**

When spiritual meaning directs a life path, it is often expressed as a desire to engage in social action (Kovel 1991). For these environmental activists, the desire to work for the environment came from their experience of an inescapable connection with the Earth, an awareness of how the natural environment is being degraded by human activity, and a feeling of responsibility. Mark, a 55-year-old wildlife professor, linked human connectedness with responsibility by saying that he was responsible because “everything I do has a consequence. I don’t know you. I’ve never met you. But I am responsible for your well-being. I’m responsible for the trees’ well-being and the rocks’ well-being. Once again, that holism.” When meaning is revealed through an experience of vital force, desire and action are

This sense of connectivity, interdependence, and responsibility led many to think of themselves as stewards of the Earth. Stewardship was sometimes described as a benefit to future generations. As Ted said, “I think the base for [stewardship] is if we are causing species

likely to follow. Educating others was the most frequently mentioned form of environmental activism, with 12 of 18 individuals being engaged in some form of educating others. Indicative of the educators, Steve said that “what I try to do now, I try to find a way to help people make a connection with the environment, not just in terms of educational experiences, but significant emotional connections.” The remaining six environmentalists engaged in other forms of action, including nonprofit environmental leadership, lobbying, and consulting on environmental and wilderness management and policy. Quinton, a 57-year-old environmental volunteer who sits on the boards of seven environmental organizations, reflected: “What I value the most is my connection with nature. I see how it has helped me. It’s where I go to relax and rejuvenate and get my energy back. If somebody else doesn’t have that then they are really missing something. I want them to have that, it’s important to me.”

### **Paths of Soul**

The environmental commitment of these environmentalists, and more specifically their environmental spirituality, was sustained most often through their connection with nature and was imbued with the meaning of biological and emotional interconnectedness, interdependence, and responsibility. Most indicated that they chose to nurture soul by choosing a path that suited their particular experience of vital force. Some followed an established religious path, such as Joyce’s Quakerism or Ted’s Christian environmental ministry. Many of these environmentalists chose less traditional means of nurturing soul. Steve, for example, said, “I don’t go to a church, I go to a forest.” Marty, a 59-year-old executive director of an environmental organization, believes in God but no longer attends church. She connects with God through “prayers at night, by being out in the world, by just having a




regular feeling of gratitude for things that have been given to me.”

## Discussion

The committed environmentalists participating in this study shared a number of characteristics, yet also differed in important ways. All spend quiet time in contemplation, meditation, or prayer, often in the natural environment. All feel connected to nature, and this has great meaning for them, to the point of inspiration. Two self-identified atheists defined their connection using biological terms, while the others acknowledged their emotional connection as well. A number of religious orientations were represented, yet every participant reported being tolerant of and open to others' spiritual and religious beliefs. Other shared characteristics included creatively engaging in active care for the Earth and for other humans as well as commitment to their environmental work. Every individual perceived a vital force, but the atheists differed from the rest by attributing that force to the sciences, such as biology, ecology, chemistry, and physics and using concepts such as motion, matter, and energy. A few individuals reported having transcendent experiences, where vital force was experienced directly. Most of those interviewed experienced vital force through earthly forms and, most often, through the natural environment in places such as wilderness. The environmentalists described vital force in many ways, mostly aligning with their religious orientation or lack of it. Their descriptors of the vital force included God, chi, higher power, the universe, and even the master of chaos. Many admitted that they do not know *what* vital force is, they just know *that* it is.

Results from this study indicate that soul is experienced personally and can-

not be universally defined. We can, however, conclude some things from this study of the spirituality of highly committed environmentalists. First, there is a vital force that can be perceived directly and through the natural world. This vital force may be imbued with deep meaning, provide a sense of connectivity and responsibility, and inspire action on behalf of the natural environment. When vital force is personally experienced, it may inspire a traditional or nontraditional spiritual practice specifically intended to nurture soul.

This study did not specifically focus on wilderness activists; however, the environmentalists I interviewed support wilderness, and their environmental work parallels the work of wilderness activists. One study participant, Valerie, who reviewed this article noted: “I think all environmentalists are wilderness advocates, although their day-to-day work is based in more urban-suburban surroundings—where the people are! We want people to experience nature daily, not just as a place where one has to drive to get there. But it is in wilderness where we feel most at home in our souls.” Environmental activists are inspired by knowing that they are connected to the vital force of life in its natural diversity and, most poignantly, in wilderness (see Figure 3). The soul-fulfilling experiences that happen in a wilderness setting are the ones that we may talk about most often. The soul of the wilderness, however, may be invoked just as truly from inside a city limit as the inside of a wilderness boundary. For those who have experienced vital spirit through the natural world, soul also emerges from working *for* wilderness, not just *in* it. 

## REFERENCES

- Frankl, V. E. 2000. *Man's Search for Ultimate Meaning: A Psychological Exploration of the Religious Quest*. New York: MJF Books.
- Gair, N. P. 1999. Out into the wilderness: The inspirational or spiritual effects of the outdoors. *Horizons* 6: 17–20.
- Gottlieb, R. S. 1996, ed. *This Sacred Earth: Religion, Nature, Environment*. New York: Routledge.
- Johnson, B. 2002. On the benefits of wilderness. *IJW* 8 (3): 28–32.
- Kearns, L. 1996. Saving the creation: Christian environmentalism in the United States. *Sociology of Religion* 57: 55–70.
- Kovel, J. 1991. *History and Spirit: An Inquiry into the Philosophy of Liberation*. Boston: Beacon Press.
- Leenders, G., and B. Henderson. 1991. Dialogue of new directions: The spiritual heart in adventure learning. *Journal of Experiential Education* 14 (2): 32–38.
- Martin, V. G. 2002. Wilderness: It's got soul. *IJW* 8 (2): 3.
- Perschel, R. 2002. Work, worship, and the natural world: A challenge for the land use professions. In S. R. Kellert, and T. J. Farnham, eds. *The Good in Nature and Humanity: Connecting Science, Religion, and Spirituality with the Natural World*. Washington, D.C.: Island Press, 145–160.
- Shaw, M., and D. Wendl-Berry. 1999. Encountering the earth: Martin Shaw talks to David Wendl-Berry about rites of passage, vision quests and encountering the earth. *Horizons* 6: 27–30.
- Shultz, P. W., L. Zelenzy, and N. J. Dalrymple. 2000. A multinational perspective on the relation between Judeo-Christian religious beliefs and attitudes of environmental concern. *Environment and Behavior* 32 (4): 576–91.
- Stringer, L. A., and L. H. McAvoy. 1992. The need for something different: Spirituality and wilderness adventure. *Journal of Experiential Education* 15 (1): 13–20.

BARBARA McDONALD is a social scientist with the USDA Forest Service, Washington office. Her address is 320 Green Street, Athens, GA 30602-2044, USA. E-mail: barmac@bigfoot.com. This research was funded by the Kellogg Foundation as a part of the Cyril O. Houle Scholars Program in Adult Education.

---

**Most of those interviewed reported experiencing vital force through earthly forms and, most often, through the natural environment such as wilderness.**

---

# Celebrating a Decade of Service

## *The Arthur Carhart National Wilderness Training Center*

BY CONNIE G. MYERS

**A**ldo Leopold once said, “A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land.” As the Arthur Carhart National Wilderness Training Center celebrates its 10th anniversary, the author reflects on what signature the center has left on the face of wilderness and on how the organization will continue to support field efforts to ensure an enduring resource of wilderness.



Article author **Connie G. Myers.**

### Roots

The Arthur Carhart National Wilderness Training Center was established in August 1993 to *preserve the values and benefits of wilderness for present and future generations by connecting agency employees and the public with their wilderness heritage through training, information, and education.* The vision for establishment of the Carhart Center can be largely attributed to Jim Bradley, staff to Congressman Bruce Vento, Minnesota, 102nd Congress.

Bradley spent several years experiencing the benefits of wild country as a fire lookout and wilderness ranger for the Forest Service (FS). He was passionate about wilderness, the agency, and historical figures and architecture. When a 1989 U. S. General Accounting Office report (requested by Vento) revealed degradation of some FS wilderness areas, Bradley began work on legislation to address these and other stewardship issues. The idea for a wilderness training center was articulated in 1992 in House Bill 4325. The bill stated that the purpose of the training center was to (1) strengthen leadership in educating employees, other agencies, and other nations on quality wilderness management; and (2) to edu-

cate the American people on wilderness laws and policies, values of wilderness, wilderness ecological processes, and ways to minimize visitor impacts on the wilderness resource. Bradley established a close working relationship with John Twiss, then national wilderness coordinator for the FS. Together, and with significant support from the Northern Region of the FS, Lolo National Forest, and others, they successfully built a shared vision for establishment of a national wilderness training center among Congress and field-going regional and national level wilderness managers.

In keeping with Bradley's vision, the center was named in commemoration of Arthur Carhart and located at the Ninemile Ranger Station and Remount Depot. Arthur Carhart was an FS landscape architect who in late 1919 became the first official in a land management agency to advocate for the designation of wilderness (McCobb 2002). Ninemile Ranger Station and Remount Depot is a historic FS facility where staff have provided leadership in fire fighting and wildland stewardship training since 1932. Start-up funding for the center was provided by the FS and Bureau of Land Management (BLM), and staff was limited to a director, a part-time wilderness technician, and shared administrative support—all FS employees. Products and services were limited to one training course and a mix of varied, loosely related activities, including production of wilderness displays and support materials. A highly passionate and dedicated group of volunteers from the field were instrumental in helping the organization develop initial products and services. Interagency communication was practically nonexistent.

### Accomplishments

The Carhart Center has grown from its original staff of one and one-half FS employees to an interagency staff of seven and one-half with representatives from the BLM, Fish and

Wildlife Service (FWS), FS, and National Park Service (NPS). Each of these agencies contributes funding in support of the organization. Using an interagency team approach, the staff works with experts within and outside the agencies to develop comprehensive interagency solutions to critical wilderness stewardship issues. Achieving interagency staffing, funding, and product development has been and continues to be one of the most demanding, challenging, and rewarding accomplishments of the center. The interagency development of products and services highlights what are sometimes significant cultural, legal, and operational differences among the wilderness stewardship agencies, and it takes longer to work through these differences than it would if a single agency stepped out on its own. Despite these challenges, the center remains firmly committed to an interagency approach, as the process and the final products generate increased consistency and continuity in wilderness stewardship within and among the four agencies and across the National Wilderness Preservation System (NWPS). These interagency efforts move us ever closer to forging an integrated and collaborative system of wilderness across the four agencies, as recommended by Brown (2002).

The center is keenly aware that funds in support of the organization are funds that do not make it directly to the field. Subsequently, the responsibility to provide timely, cost-effective products and services in support of field efforts is taken quite seriously. Training offered and materials produced are in direct response to existing and anticipated wilderness and wildlands management issues, training needs, and educational outreach needs identified by wilderness managers from each agency through periodic needs assessments. Materials developed are distributed electronically, and training sessions are offered where

they are needed most. This approach has virtually eliminated duplication of effort, staff, and funding. By leveraging limited resources across agencies and outsourcing where possible, the number of employees trained has increased while the cost of training has decreased. Specifically, when the center was established in 1993, only one course was offered for 60 FS employees at a cost of \$1,100 per person. In fiscal year 2002, 12 courses were offered for more than 800 employees from all agencies and state, nongovernmental, and international organizations at a cost of \$415 per person, reflecting significant cost efficiency.

## Training

The training goal of the Carhart Center is to *improve consistency and collaboration in on-the-ground wilderness decisions among managers, stewardship skills among wilderness staff, and wilderness awareness among agency employees through training*. Through a partnership with the University of Montana, the Wilderness Management Distance Education Program has expanded. Graduate credit can now be gained for nearly all the distance education courses, and some of these courses can be taken interactively via the internet. Additionally, the suite of courses offered by the Carhart Center has expanded significantly. Following the National Wilderness Stewardship course offering in 1993, Regional Stewardship courses came online in 1994, Planning and Restoration in 1995, Wilderness Interpretation and Education in 1997, and Visitor Use in 1998. Natural Resources Monitoring in Wilderness was offered for the first time in 2002, and an Eastern Restoration course is slated for debut in 2003. The Unit Wilderness Workshops initiated in 2002 reflect a significant deviation from the typical five-to-seven-day course. Rather than employees from several units attending



**Figure 1—Arthur Carhart was a champion for wilderness. Photo courtesy of the U.S. Forest Service.**

a course, Unit Workshops are one-to-four-day sessions hosted at a unit and attended by nearly every employee on that unit. While core information about The Wilderness Act and wilderness stewardship is provided, the bulk of the workshop is tailored to address specific wilderness stewardship issues identified by the unit. This custom approach has met with tremendously positive results, both in the numbers of people trained and in outcomes. Wilderness awareness and understanding among unit employees is dramatically improved by bringing together fish, wildlife, and plant biologists; fire, cultural resource, recreation, and wilderness managers; interpreters, law enforcement, and facilities managers; front desk personnel; and unit leadership. A critical mass of wilderness-informed employees is generated who have the tools needed to work together to successfully address their wilderness stewardship issues. One park superintendent wrote of the workshop, “The direct benefit is that we now have a large portion of the permanent staff that has attended this training and has a better understanding of the role of wilderness in their day-to-day management activities.”





**Figure 2—Congressman Bruce Vento, staffer Jim Bradley, and Wes Henry, NPS national wilderness program leader on August 21, 1993, when the Carhart Center and the Leopold Institute were dedicated. Photo courtesy of Connie G. Myers.**

## Information

The information goal of the Carhart Center is to *enhance communication and consultation among the natural resource workforce, scientists, educators, students, and the public through ready access to a broad base of current and timely wilderness information*. Wilderness.net has played a significant role toward accomplishment of this goal. Established in 1997, wilderness.net is a partnership among the Carhart Center, the Aldo Leopold Wilderness Research Institute, and the University of Montana's Wilderness Institute with the purpose of electronically providing wilderness information to agency employees, scientists, educators, and the public. Content is developed by wilderness stewards and through research conducted by federal agencies, university professors, and others. Additional information from various sources is compiled to provide a comprehensive information base for wilderness stewardship. A decision-making protocol for wilderness.net has been established to ensure that information is reviewed and endorsed before it is put up on the site. Through searchable databases, wilderness.net provides information on each of the more than 640 wilderness areas in the NWPS, wilderness legislation, research, issues, photos, and more. Wilderness.net has become the primary

vehicle for providing a broad base of current wilderness information to a number of audiences and has been nationally recognized as a success. Harvard University's John F. Kennedy School of Government selected wilderness.net as a case study for successful use of the internet to achieve agency goals, and Brown (2002) highlighted the significant contributions that wilderness.net has made to improving collaboration and communication in wilderness stewardship. The Carhart Center remains committed to facilitating the exchange of information and discussion of current stewardship issues so that managers can learn from each other's successes and failures. Wilderness.net will continue to play a significant role in this effort.

## Education

The education goal of the Carhart Center is to *foster development of a personal stewardship ethic and support for the National Wilderness Preservation System among the American public by increasing awareness, knowledge, and understanding of their wilderness heritage*. In 1992, before the Center formally existed, it hosted a Wilderness Education Workshop to help managers develop wilderness education plans. In 1994, the center supported the National Geographic Society workshop on wilderness for 108 teachers from across the country, the provinces of Canada, and Puerto Rico. The first Wilderness Interpretation and Education course was hosted in 1997. The K–12 Wilderness & Land Ethics Curriculum was completed in 1999, and in that same year the center revised the NWPS map through a partnership with The Wilderness Society, Trails Illustrated, and the Leopold Institute. The center outsourced completion of the National Unified Wilderness Education and Outreach Plan to the Student Conser-

vation Association in 2001. The Carhart Center has been a leader in establishing partnerships with a number of nongovernmental organizations, academic institutions, user groups, and funders to collaboratively develop and fund events and activities to advance nationwide wilderness outreach efforts during the 40th anniversary year of The Wilderness Act. Under leadership from the Carhart Center, an interagency team of wilderness managers and educators is revising the Wilderness and Land Ethics Curriculum to increase wilderness awareness and understanding among U.S. schoolchildren. A film, *American Values: American Wilderness*, is being produced for public broadcast to highlight the wilderness benefits valued by Americans of diverse social backgrounds. The National Atlas Program of the U.S. Geological Survey will produce an updated version of the NWPS map with considerable leadership from the Leopold Institute. While these and other national events and activities are noteworthy, it is the broad-based, comprehensive education and partnership network developed with leadership from the Carhart Center that is most significant. For the first time in history, the federal agencies, nongovernmental wilderness organizations, academia, and private funding organizations are working together and sharing resources to advance nationwide wilderness outreach efforts.

## Future Challenges

While much has been accomplished with limited resources, much work remains to address critical wilderness stewardship issues and to broaden public understanding and support of wilderness heritage. In the training arena, nearly 1,000 unit managers have attended a Regional or National Wilderness Stewardship Course. However, this represents only 27% of BLM wilderness

managers, 49% of FWS wilderness managers, 20% of FS wilderness managers, and 40% of NPS wilderness managers. Additionally, there are now more than 640 wilderness areas administered by about 455 units, and Unit Wilderness Workshops have been conducted on only 4% of these units. How can the center accelerate a proactive wilderness training program to effectively fill these considerable training gaps within existing staff and funding levels?

Wilderness leadership from each of the agencies has agreed to implement recommendations to “(1) utilize and strengthen the role of wilderness.net to provide an open system of information about wilderness, and (2) facilitate the exchange of information and discussion of current stewardship issues so that we learn from each other’s successes and failure.” (FWS/CNWR-NR/008430). What can the Carhart Center do to help implement these recommendations while keeping current staff and funding focused on meeting demands for training?

Fully 86% of NPS lands, 20% of FS, 9% of BLM, and 20% of FWS lands are wilderness or wilderness study areas. Efforts are currently underway to increase awareness, appreciation, understanding, and support of wilderness among the American people. A National Unified Wilderness Education and Outreach Strategy has been developed, and a concerned and committed group of representatives from multiple organizations has come together to collaborate on the development and funding of nationwide wilderness outreach efforts in celebration of the 40th anniversary of The Wilderness Act. What can the Carhart Center do to ensure success of these efforts and continuation of national wilderness education efforts when current staff and funding are focused on meeting demands for training?

---

## The Carhart Center remains grounded in the belief that the organization exists to serve and is accountable to field-going wilderness rangers and to those who toil away understaffed and underfunded to ensure an enduring resource of wilderness.

---

While significant, these challenges are no more insurmountable than was getting the Carhart Center up and running in the first place, as the Carhart Center has far more talent to draw upon than its current seven and one-half employees. The center is more than just the handful of people who work at the organization. The Carhart Center remains grounded in the belief that the organization exists to serve and is accountable to field-going wilderness rangers and to those who toil away understaffed and underfunded to ensure an enduring resource of wilderness. By serving those who steward wilderness, it is the wilderness stewards themselves who become the core workers of the Carhart Center. They organize and present courses, they develop information project ideas, and they revise curriculum. It is the strength of conviction, dedication, and passion of wilderness stewards that has made the Carhart Center what it is today, and it is only with their continued permission to let the Carhart Center lead that the organization will develop the capacity to fully realize its mission to *preserve the values and benefits of wilderness for present and future generations by connecting agency employees and the public with their wilderness heritage through training, information, and education.*

### Conclusion

Arthur Carhart was in his 80s when recognized for the influence he had on advancing the wilderness concept.

Upon that recognition, he said, “I feel real good about how it has all turned out. The Forest Service has come a long way. I am proud to have been associated with it in those early days.” Looking back, the wilderness community can say the same about the Arthur Carhart National Wilderness Training Center. It has indeed come a long way, and, like Arthur Carhart, this author is proud to have been associated with it in those early days. While we take great pride in accomplishments of the center, we cannot stand in the shadow of success. Collectively, we must boldly step out to embrace the challenges before us and seize this moment to ensure an enduring resource of wilderness. 🌿

### REFERENCES

- Brown, P. J., 2002. A summary of the report: Ensuring the stewardship of the National Wilderness Preservation System. *IJW* 8 (1): 10–12.
- FWS/CNWR-NR/008430. 2002. Official correspondence from Dan Ashe, Chair, Interagency Wilderness Policy Council to Dr. Perry L. Brown.
- GAO/RCED-89-202. 1992. Wilderness preservation: Problems in some national forests should be addressed.
- HR 4325, 1992. 102nd Congress, 2nd Session.
- McCobb, James E. 2002. Trappers Lake and Arthur Carhart: Rocking the cradle of wilderness. *IJW* 8 (2): 9–13.

CONNIE G. MYERS is the director of the Arthur Carhart National Wilderness Training Center, 32 Campus Drive, Missoula, MT 59812-3168, USA. E-mail: [cgmyers@fs.fed.us](mailto:cgmyers@fs.fed.us).

# Bill Worf Wins 2003 Corrigall Wilderness Stewardship Award

**B**ill Worf, founder and president of Wilderness Watch has been selected as the 2003 Keith Corrigall Wilderness Stewardship Award winner. This annual award, established in 2002 with *IJW* at the request of the four federal agency wilderness coordinators, is given to a person or persons whose efforts to protect and manage wilderness are worthy of special recognition. The award honors the late Keith Corrigall, who was wilderness branch chief for the Bureau of Land Management during that agency's formative years of wilderness programming from the mid-1980s to mid-1990s.

The following includes excerpts from Bill's nomination letter, submitted by George Nickas, executive director of Wilderness Watch, and captures Bill's many contributions to Wilderness:



Bill Worf has been a leader in Wilderness stewardship for more than 40 years. Bill's early leadership in promoting Wilderness protection as the Forest Supervisor in charge of overseeing the stewardship of

the Bridger Wilderness landed him on the Forest Service task force that wrote the agency's policies and regulations for implementing the Wilderness Act of 1964. Most of those policies and regulations still stand today. After his task force work, Bill served four years in the Forest Service's Washington headquarters as their national leader for Wilderness and Wild and Scenic Rivers programs.

Bill moved back to his native Montana in 1969 to serve as the Director for Recreation, Wilderness and Lands for the Northern Region of the Forest Service. Over the next 12 years, Bill built a Wilderness

program that made mention of the Northern Region synonymous with Wilderness leadership.

After "retiring" from the Forest Service in 1981, Bill continued working for wilderness stewardship as a citizen advocate and a volunteer consultant for Forest Service programs. His commitment to Wilderness kept him in the thick of the fray of many stewardship "battles" ... as it does today through Wilderness Watch's nationwide monitoring of intrusions that threaten the integrity of designated wilderness.

In 1993, Bill and his wife Eva Jean established the Gary and Keith Worf Memorial Scholarship Fund at the University of Montana School of Forestry to be used to help the next generation of Wilderness stewards.

Bill's relentless advocacy and concern for Wilderness eventually led him to found Wilderness Watch, the only citizens' organization dedicated solely to the protection and proper stewardship of lands in the National Wilderness Preservation System and Wild and Scenic Rivers System. Under Bill's leadership and during his tenure as president, Wilderness Watch has grown from a group of volunteers in Missoula, Montana, to a national organization recognized for its Wilderness advocacy by managers and citizen advocates across the land. Rarely does a day go by that Bill Worf doesn't work tirelessly as a citizen advocate and—as he'll be certain to remind anyone listening, a Forest Service retiree—for the protection of the Wilderness.

Bill has served as an inspiration to generations of Wilderness rangers, managers, academics and citizen activists.

We at *IJW* are pleased to grant this year's Corrigall Award for Wilderness Stewardship to Bill Worf. We especially recognize his long service and continuing commitment to improve the stewardship and protect the integrity of the U.S. National Wilderness Preservation System. Not everyone agrees with Bill Worf on every wilderness issue—but few would disagree that his efforts have helped keep our Wilderness System wild. Congratulations, Bill! We salute you. **IJW**



# On Writing *Wilderness Ethics*

## Some Further Musings on the “Spirit Of Wildness”

BY LAURA WATERMAN

I was recently introduced to a Maasai man from Kenya. Erick Kasana, a conservation officer, was in the United States to attend a conference at Harvard University about creating solidarity at the community and grassroots level. My friend, Kate, a Harvard student who had helped to organize the conference, brought Erick up to Vermont to experience snow for the first time. Following an afternoon of sledding we settled into my house for dinner.

“Here’s Laura and Guy’s book I was telling you about,” Kate said, handing Erick *Wilderness Ethics* (Waterman and Waterman 1993).

During dinner Erick explained to me the complex situation of land pressures the Maasai now feel as a result of colonialization. “Our economy,” Erick said, “that is our cattle, needs a natural resource base.”

“You mean grass? The grasslands?” I asked.

“Yes,” Erick said. “And grazing creates a pressure and threat to wildlife and flora. But it’s more complicated than that. What appears as over-grazing is the result of complex pressures from people that have forced the Maasai onto marginal land.”

When we said good night, Erick took *Wilderness Ethics* with him, and I noticed his light was on for some time. But what can he be finding, I wondered? Our focus in that book is the northeastern U.S. Our forested land, our mountains are so unlike his grasslands. Then I began to think about what had caused us to write the book in the first place.

Like Erick, Guy and I spent a lot of time on the ground. We took every opportunity to be in the mountains, and in fact quit our city jobs, bought land in the country and began to homestead so we could structure a life lived outdoors with plenty of time for hiking and climbing. We moved to Vermont in 1973 and for nearly the next thirty years the White Mountains of New Hampshire became home to us as well.

We needed to earn a little money, and continuing as writers seemed like a good way to supplement what we could grow in our vegetable garden. We connected with a Boston-based magazine called *New England Outdoors* and the editor, a fly-fisherman named Mike Pogodzinski, offered us a monthly column on camping and hiking. This continued for the next five years.

In these columns we wrote about what we observed on our trips to the mountains. Often, it seemed to us, that values were in conflict in the backcountry. Here are three examples.

1. On a hike into a lean-to beside a mountain pond that we’d recalled as being an idyllic spot just a few years earlier, we now found a crowded and heavily used site. Wood railings were erected to discourage hikers from cutting through the woods every which way, and a board pathway had been laid down on the wet trailbed around the pond. The managers were trying to “protect the resource” here, but in the process had turned this beautiful place into a woody suburbia. It struck us that the same results could be achieved by blocking off access to the trampled spots with boulders or rotten logs, and using rough-hewn planks not store-bought lumber, to create a treadway over the muddy path skirting the pond.



Laura Waterman climbing in New Hampshire in 1989. Photo by Chuck and Barbara Kukla.



Figure 1—Guy and Laura Waterman in the Presidential Range of the White Mountain National Forest. Photo courtesy of Laura Waterman. Photo by Jean Cooley.

2. Once on a bushwhack up a stream valley we came across a flattened clearing with a net work of trampled paths. We saw the charred remains of numerous campfires. The woods appeared denuded of down trees, and the spruce and fir were stripped to head height of all their lower branches. Along the stream we saw evidence of heavy tramping, with some of the banks caved in. We later learned that this was the location for a wilderness course for a nearby school. Every November for the past 24 years about 100 students, in groups of 10 with two adult leaders, went out backpacking for two weeks along a craggy and forested ridgeline. At the end of the course, each student was sent off into the woods

to experience the solitude of a three-day solo. They were expected to keep a journal and take a close inward look at themselves, while keeping outwardly warm with a campfire. The twenty teacher/leaders were camped also, and also kept a campfire going. This was seen as a priceless experience for young people. On our hike we had stumbled across the results of its impact on the forest.

3. With a few friends we had climbed to the summit of a remote New Hampshire four thousand-foot peak by a steep, trailless route. The hike had proved harder and longer than expected, and we arrived on top late in the afternoon. The plan was to take the trail down, but we'd have to move fast to avoid

being benighted. We all felt the thrill of climbing this isolated peak by a route that took all our skill with map and compass, not another party in sight all day. The view before us showed only mountains. So we were a bit taken aback when a member of the group pulled out his cell phone. "Hi honey, just calling to let you know I'm safe. We're on the summit and are about to take the trail down. Guess I'll be late for dinner though." That's not putting it strong enough. We were aghast! That single call smashed through the fragile fabric of wildness. In fact that phone's presence made a travesty of our climb where we had felt so committed, so on-our-own in the wild.

From these, and many other similar experiences, we began to see that highly desirable goals like education, safety, and protecting areas from impact can have an adverse affect on other, equally important, and sometimes fragile or vulnerable values. We began to realize what was most at risk wasn't necessarily the physical, but a spiritual quality as well. We began to call this elusive value the spirit of wildness.

## The Spirit of Wildness

Our thoughts about the spirit of wildness grew when we began a tenure of trail maintenance on the Franconia Ridge. This is a 1.8 mile section that traverses several White Mountain summits and lies entirely above treeline. Guy and I were privileged to have this responsibility from 1980 to nearly 2000, the year of Guy's death. Our main concern was to take care of this popular trail in such a way that would protect the precious alpine plants, yet not interfere with the hiker's

sense of freedom. We thought it essential that our trail work not stand as a barrier to hikers experiencing the wildness of this Ridge.

Reading Aldo Leopold's (1966) *Sand County Almanac* influenced our thinking also. Leopold's cry is that only when we stop looking at land as commodity, will we see the land has value in and of itself. Only then will we treat land with true respect. Leopold called this new way of seeing a "new land ethic." We sought to carry this a step further in relation specifically to wild land. In *Wilderness Ethics* we proposed that some roughhewn wilderness ethic was needed that spoke for the spiritual side of wild. The intangibles, the subjective elements, we saw as being even more fragile and threatened than the physical. We were pleading for respect for the mystery of wildness.

Our question to readers was: once the land has been saved from development—the strip mining, logging, dam construction, second homes—then what? "Profound theorists," we wrote, "we are not. We're just two people who spend a lot of time in the woods and on the mountains; who have observed a few things and asked ourselves a few questions about wildness, and who would like to invite you to share our thoughts and think about some practical questions yourself:

- What are we trying to preserve?
- What are the threats to the wildness in wilderness?
- What can we do about it?"

We wanted to write a book that alerted readers to the fragility of wildness and how easy it was to erode it away by building a hut at some quiet view spot, or locating a trail up a hitherto pathless ridge, or constructing a bridge where none has been deemed needed before, or calling out the helicopters, or traveling in large groups, or whipping out a cell phone. Wild-

ness can be easily overlooked by hikers and managers alike; wildness is expendable, and once spent, we can rarely call it back.

It seemed to us a question of values. We were asking hikers and managers to think about what was important. What was at stake? What mattered? If wildness was an important value, we could view questions from whether to construct a new trail to tramping through the woods in large groups through that lens.

Another way to approach thinking about what kind of backcountry we wanted was from a love of land. We hoped hikers and managers would be guided by a concern for the land's well-being and would approach the care of land with a spirit of humility. That, too, was a way to keep the spirit of wildness alive.

It seemed to us that this meant a real change of thinking if we were to exercise this kind of restraint, respect, and responsibility. This was more than a question for the managers—the hiking clubs, the Forest Service and the Park Service—to grapple with. We were asking every hiker and backpacker and climber, fisherman and hunter—all outdoor people to think about backcountry in terms of values when we asked ourselves the question: what kind of backcountry do we want?

## Musings on Wildness

One of our favorite quotations is often attributed to conservationist Geza

Teleki: "Everything is less important. Career is less important. Science is less important. Fame is less important than doing the right thing when you're dealing with the natural environment."

Guy and I admired Teleki's words for their humility. As we learn to put them into practice, we turn ourselves into stewards of the land in the sense Leopold had hoped for. Humility seems key to how we relate to land. If we were more humble, all of us, wouldn't the spirit of wildness stand a better chance?

Much has changed since Guy and I wrote our early columns for *New England Outdoors*, Land managers have come a long way toward learning how to "protect the resource" in ways that are in keeping with the quiet nature of the woods. Schools and clubs who offer outdoor programs are learning how to clean up their act. But many threats remain such as cell phones, radios, and the persistent use of helicopters. Managers still upgrade backcountry facilities in ways that seem out of step with a wilderness experience. And more people keep coming. With *Wilderness Ethics* we hoped to begin the conversation. Now it depends on the hikers and managers to keep the dialogue alive as we make decisions for the future.

It seems to me that Erick Kasana faces many of the same issues we do here in the northeast. For us, the land faces the pressures of people—we

---

**We need mountains and wild country more now than ever, and more pressures are being put upon the land as people come in droves, looking for solace and solitude, spiritual renewal and strength, exercise and just plain fun.**

---



hikers and climbers. For the Maasai, pressures came from their colonial legacy, present-day tourists, as well as their own growing population with the result that the Maasai's cattle are increasingly crowded, leading to overgrazing.


Erick and Guy and I look for a response—as well as solutions—to land issues from those to whom the land matters most. Our hope is that our grassroots efforts will have that ripple effect of a large stone dropped into the center of the pond: we want to see the rings widening out and out, far beyond the point of impact, far beyond the limits of our vision.

Guy and I desired to make room for the spirit of wildness. This was our message we tied around the stone we dropped in the pond. Giving room to what nurtures our spirits when we go to the mountains is, it seems to me,

the ultimate challenge as we stride into the twenty-first century.

We need mountains and wild country more now than ever, and more pressures are being put upon the land as people come in droves, looking for solace and solitude, spiritual renewal and strength, exercise and just plain fun. We wrote *Wilderness Ethics* because it seemed to us that it was terribly important to save this elusive thing we cannot see, this spirit of wildness that is so essential to our human souls, the underlying reason, whether we are aware of it or not, why we seek the wild places.

I would venture to say that Erick and Guy and I are all concerned with the same values here: the physical and spiritual aspects of the land ethic. The Maasai have an immediate need to address the physical, but I would guess that a spiritual ethic is critical to them as well, and that their own culture is

grounded in a spiritual connection to the land. Whether Maasai or American we all need a land ethic that is physical and spiritual, and as a community of people on the earth we need to think about what this means, define it for ourselves (there is no formula, no easily applied blueprint) whether we live in the northeast, the west, or in Africa. 

#### REFERENCES

- Leopold, Aldo. 1966. *A Sand County almanac. With other essays on conservation from Round River*. New York, Oxford University Press.
- Waterman, Laura and Guy Waterman. 1993. *Wilderness ethics: preserving the spirit of wildness*. Woodstock, Vt. Countryman Press.

LAURA WATERMAN is an author on wilderness issues such as *Backwoods Ethics* (Stone Wall Press, Washington, DC, 1979) and maybe contacted by mail at P.O. Box 1064, East Corinth, VT 05040.

## Advertising in *IJW*

The *International Journal of Wilderness* accepts display ads that are appropriate to the wilderness topics and issues typically reported in the journal and that would be of interest to its readership. The printed copy in an article must be submitted electronically as a Microsoft Word file, and any artwork or illustrations must be submitted in hard copy as a black-and-white image. Advertising rates per issue for black-and-white ads are:

Space	Size	Rate
Full Page	7 x 9 <sup>5</sup> / <sub>8</sub>	\$800
2/3 Page	4 <sup>1</sup> / <sub>2</sub> x 9 <sup>5</sup> / <sub>8</sub>	\$600
Horiz. 1/2 Page	7 x 4 <sup>3</sup> / <sub>4</sub>	\$450
Island 1/2 Page	4 <sup>1</sup> / <sub>2</sub> x 7	\$450
Vertical 1/3 Page	2 <sup>1</sup> / <sub>4</sub> x 9 <sup>5</sup> / <sub>8</sub>	\$375
1/4 Page	3 <sup>1</sup> / <sub>2</sub> x 4 <sup>3</sup> / <sub>4</sub>	\$300
1/6 Page	2 <sup>1</sup> / <sub>4</sub> x 4 <sup>5</sup> / <sub>8</sub>	\$200

Contact the *IJW* managing editor,  
Chad Dawson at  
Phone: 315-470-6567 • Fax: 315-470-6535  
E-mail: cpdawson@esf.edu.  
about an advertising submission or to ask about  
availability of space. Make check payable to  
*International Journal of Wilderness*.

# Is the Public Viewpoint of Wilderness Shifting?

BY H. KEN CORDELL, MICHAEL A. TARRANT, and GARY T. GREEN

**Abstract:** This study explores shifts since the mid-1990s in the values the public places on wilderness. Public views of the National Wilderness Preservation System (NWPS) were compared from national surveys conducted in 1994 and 2000. Results show that while more people in 2000 were aware of the NWPS, this increase in awareness has not created greater support for additional wilderness acreage. Levels of importance people place on ecosystem services, existence of wilderness, recreation, and future use options for existing protected wilderness, however, have increased sharply since 1994. Overall, these shifts seem to indicate a need for greater emphasis on nonuse values in setting policy and managing wilderness. Awareness and support for wilderness vary significantly among ethnic, age, and regional groups.

## Introduction

This paper explores evidence of recent shifts in how Americans view the National Wilderness Preservation System (NWPS). Recent political and societal changes suggest that tracking such shifts, if in fact they exist, is highly important. One aspect of growing social change is the rise of interest in nonuse values for making decisions about allocating and managing public lands, such as those designated as part of the NWPS (Rolfe, Bennett, and Louviere 2000). Historically, use values have been the dominant focus of attention because uses of wilderness for personal benefits, such as for recreation, for profit-making involving on-site services (e.g., outfitters) or for extraction of raw materials, such as mining minerals for use in manufacturing (Mountford and Keppler 1999) are direct, observable, and sometimes tangible and marketed. In contrast, nonuse values are indirect, for the most part not observable, and are not marketable. Nonuse values, for example, may focus on preserving natural lands for future generations, including both human and nonhuman species. Although they are for the most part “intangible,” it has been argued that nonuse values of wilderness are likely to be as, or more, important than use values (Loomis, Bonetti, and Echohawk 1995).

There is evidence in the literature that indeed wildland values as perceived by the public have been undergoing a



Figure 1—Viewing wildlife in wilderness is an important experience. Photo courtesy of Aldo Leopold Wilderness Research Institute.

fundamental shift. A number of recent studies have pointed to an apparent increase in nonuse values, especially life support values (e.g., Bliss, Nepal, Brooks, and Larsen 1994; Steel and Lovrich 1997; Tarrant and Cordell 1997; Xu and Bengston 1997). In an early study of wilderness values, Walsh, Loomis, and Gillman (1984) reported that Coloradoans’ willingness to pay for wilderness designation was proportioned as follows: recreation (43%), bequest (21%), existence (20%), and option (16%). In a more

(PEER REVIEWED)



**Figure 2—Habitat for wildlife is highly valued by the American public. Photo courtesy of Aldo Leopold Wilderness Research Institute.**

recent study, Gilbert, Glass, and More (1992) found that Vermont residents assigned a smaller proportion of their willingness to pay for wilderness protection to recreation use value (16%) and a greater proportion to nonrecreation values. Most recently, Cordell, et al. (1998) found direct use values generally to be of lesser importance than ecological, environmental quality, and off-site values.

The purpose of this study was to test whether there have been recent shifts in how Americans value the NWPS. Three objectives were pursued comparing data collected in identical fashion in 1994-1995 and in 2000: (1) examine the percentages of respondents aware of the NWPS and who support expanding its size, by place of residence, region of residence, age, and race; (2) examine the percentage of respondents rating each of 13 wilderness values as very to extremely important; and (3) examine the structure of orthogonal factors in the 13-item wilderness values scale, where differences would suggest a trend on how value items are perceived.

## Methods

Sampling, selection, measurement of variables, and analysis in the 2000 survey followed the same methods as used for the 1994-1995 National Survey on Recreation and the Envi-

ronment (NSRE) (Cordell et al. 1998). In both applications of the NSRE, noninstitutionalized individuals in households (in all 50 states) with telephones were randomly sampled (using a random digit dialing method with up to 10 repeated redials of unanswered numbers). The target individual for the interview was the household member with the most recent birthday among those 16 or older. Interviews for both the 1994-1995 and the 2000 surveys were conducted by the Human Dimensions Research Laboratory at the University of Tennessee. A total of 1,900 NSRE interviews contained wilderness value questions in 1994-1995, while, with a larger budget for the 2000 survey, a total of 5,002 interviews with wilderness value questions were completed. The greater number of interviews in 2000 facilitated more resolute geographic disaggregation of estimates at the nine Census Division level. With the smaller sample in 1994-1995, comparisons were limited to the four Census Region level. However, when compared with the demographic profile of Americans 16 or older obtained from Census estimates, both samples represented well the demographic diversity of the American public at the geographic levels reported in this paper (east vs. west). To correct for disproportionate sampling within population strata, both NSRE data sets were weighted using census estimates of proportions among rural/urban, east/west, age, and race strata.

In both applications of the NSRE, the introduction and wording of the wilderness values questions were the same. An introductory statement was read: "The Wilderness Act of 1964 allows Congress to preserve certain federal lands in their wild condition. Since that 1964 act, the Congress has added 629 wilderness areas to the

National Wilderness Preservation System to protect wildlife, scenery, water, and recreation opportunities, and to keep these areas wild and natural." Following this statement, a variety of questions were asked regarding the current size and status of the NWPS, including whether or not the respondent felt the system was large enough. Another statement was read: "Wilderness areas provide a variety of benefits for different people. For each benefit I will read, please tell me whether it is extremely important, very important, moderately important, slightly important, or not important at all to you." Following this statement, each of 13 value items (WVS) was read to each respondent using the same organization and wording in both survey applications. The WVS includes questions on (a) direct use values (i.e., valuing access to use wilderness for recreation, personal growth, commercial activities, or other on-site activities); (b) option use values (i.e., valuing having the option to use wilderness in the future); (c) non-use existence values (i.e., attaching value to knowing that wilderness exists or to knowing it protects wildlife or some other natural features, even though one may never visit nor expect to visit an area); and (d) bequest values (i.e., valuing having wilderness for future generations) (Loomis, Bonetti, and Echohawk 1995; Mountford and Keppler 1999; Oglethorpe and Miliadou 2000). The 13 items in the WVS were each measured on a 5-point single-polar scale with end points of 1 = "extremely important" to 5 = "not at all important."

Objective one was tested with chi-square analysis. Mean scores, percentages, and associated change scores were computed for objective two. A principal components analysis (with varimax rotation and pairwise



deletion of missing cases) was used to identify orthogonal factors (with eigenvalues greater than 1.0) in the WVS for objective 3. All tests were conducted with a significance level of  $p = .05$ .

## Results

Larger percentages of Americans over 15 years of age reported they were aware of the NWPS in 2000 (57.6% vs. 44.4%). Percentages reporting awareness increased for all demographic strata (see Table 1), but smaller percentages in 2000 (51.6% vs. 55.7%) reported they felt there is currently not enough wilderness under protection. Significantly more western than eastern residents ( $\chi^2 = 10.96$ ), older than younger ( $\chi^2 = 270.78$ ), and whites than nonwhites ( $\chi^2 = 113.52$ ) were aware of the NWPS. In addition, significantly more metro than rural residents ( $\chi^2 = 41.26$ ), eastern than western residents ( $\chi^2 = 34.18$ ), younger than older ( $\chi^2 = 131.67$ ), and whites than nonwhites ( $\chi^2 = 32.72$ ) felt that there was not enough land in the NWPS. The number of significant differences in awareness and preference for size of the wilderness system in the 2000 sample is considerably more than in 1994. In that earlier sample, the only significant differences were older (vs. younger) respondents being significantly (a) more aware of the NWPS and (b) less likely to feel that the amount of wilderness in the NWPS was not enough.

With the exception of tourism income and providing spiritual inspiration, very few respondents in 2000 (less than 5%) rated any of the 13 wilderness values as "not important" (see Table 2). The percent of people rating the 13 wilderness values as "very" or "extremely important" increased sharply. The greatest in-

**Table 1. Response of Americans 16 or Older, by Demographic Characteristic, Regarding the National Wilderness Preservation System, 1994 and 2000.**

Demographic Strata	Aware of NWPS (%)		Size of NWPS Is not enough (%)	
	1994	2000	1994	2000
Metro/urban				
Metro resident	44.2	57.5	56.9	54.2
Rural resident	45.2	57.7	52.0	44.2
East/west resident				
Eastern resident	42.7	56.0	56.3	53.4
Western resident	49.9	60.6	53.7	48.0
Age				
Age 16–30	31.8	39.4	63.6	56.7
Age 31–55	48.3	61.4	57.2	54.8
Age over 55	57.1	69.9	38.3	38.5
Race				
Race is white	45.5	61.3	56.4	52.4
Race is nonwhite	37.6	37.9	51.3	48.3
All Americans 16 or over	44.4	57.6	55.7	51.6

**Table 2. Changes in Americans 16 or Older Indicating "Very or Extremely Important" and "Not Important" and Change in Mean Score for Each of 13 Wilderness Values, 1994 (n = 1,900) and 2,000 (n = 5,002).**

Wilderness value	Very or extremely important (%)			Not important (%)			Mean score <sup>1</sup>		
	1994	2000	Δ	1994	2000	Δ	1994	2000	Δ
Protecting water quality	78.9	93.1	14.2	1.7	0.6	-1.1	1.77	1.53	-.24
Protection of wildlife habitat	78.6	87.8	9.2	2.6	0.6	-2.0	1.81	1.62	-.19
Protecting air quality	78.0	92.3	14.3	2.6	0.6	-2.0	1.79	1.52	-.27
For future generations	76.9	87.0	10.1	2.0	1.1	-0.9	1.84	1.68	-.16
Protection for endangered species	73.7	82.7	9.0	4.9	1.8	-3.1	1.92	1.74	-.18
Preserving ecosystems	66.5	80.0	13.5	7.0	1.6	-5.4	2.14	1.82	-.32
Scenic beauty	59.7	74.0	14.3	5.4	1.8	-3.6	2.18	1.98	-.20
Future option to visit	59.4	75.1	15.7	7.7	3.1	-4.6	2.24	1.98	-.26
Just knowing it exists	56.1	74.6	18.5	6.4	2.2	-4.2	2.23	1.98	-.25
For scientific study	46.3	57.5	11.2	14.1	4.4	-9.7	2.55	2.33	-.22
Recreation opportunities	48.9	64.9	16.0	10.1	2.5	-7.6	2.46	2.17	-.29
Providing spiritual inspiration	43.2	56.5	13.3	18.3	8.9	-9.4	2.62	2.43	-.19
Income for tourism industry	22.8	29.7	6.9	41.1	17.6	-23.5	3.33	3.12	-.21

<sup>1</sup>Value scores ranged from "extremely important" = 1 to "not important" = 5.

**Table 3. Loadings on Two Orthogonal Factors from the 13 Wilderness Values Items Using Principal Components Analysis with Varimax Rotation, 1994 and 2000 (Underlining Indicates the Associated Factor for That Variable).**

Wilderness value	Factor 1		Factor 2	
	Wildland protection		Wildland utilization	
	1994	2000	1994	2000
	Beta	Beta	Beta	Beta
Protection of wildlife habitat	<u>.81</u>	<u>.75</u>	.17	.18
Protection for endangered species	<u>.79</u>	<u>.76</u>	.20	.17
Preserving ecosystems	<u>.79</u>	<u>.74</u>	.10	.23
For future generations	<u>.77</u>	<u>.68</u>	.21	.22
Protecting air quality	<u>.73</u>	<u>.73</u>	.25	.15
Protecting water quality	<u>.71</u>	<u>.68</u>	.19	.01
Future option to visit	<u>.58</u>	<u>.54</u>	.46	.43
Just knowing it exists	<u>.57</u>	<u>.54</u>	.46	.42
For scientific study	.47	.31	.37	<u>.50</u>
Scenic beauty	.52	.42	<u>.53</u>	<u>.54</u>
Providing spiritual inspiration	.33	.22	<u>.56</u>	<u>.65</u>
Recreation opportunities	.27	.20	<u>.71</u>	<u>.66</u>
Income for tourism industry	.01	.01	<u>.82</u>	<u>.75</u>

creases occurred for items related to ecosystem services (e.g., protecting air and water quality); existence (e.g., preserving wildlife habitat and protecting endangered species); recreation; and future option values. Similarly, the mean scores for each item have all shifted toward greater importance from 1994 to 2000. The rank order of the value items in 2000 was approximately the same as in 1994, except that protecting air quality moved to the second highest position, replacing protection of wildlife habitat. The reliability coefficient (Cronbach's alpha) for the WVS was .86, which is similar to the alpha of .90 obtained from the 1994 data.

An exploratory factor analysis with varimax rotation produced the same two wilderness value factors as in 1994 (see Table 3). Consistency in structure of these factors over time indicates persistence of the dichotomy between nonuse and use values. The nonuse

wildland protection factor accounted for over 31% of the variance, and the wildland use value factor accounted for 19% of the variance (over 50% of total variance was taken into account between these two factors). Significant loading scores value by value in the WVS for each of the two surveys are underscored in Table 3. The only inconsistent trend in the factor loadings across the 13 items was that the value "scientific study" did not load on either factor for the 1994 data, while in 2000 this value loaded onto the "wildland utilization" factor. It should be acknowledged that the wildland utilization factor comprised fewer items than the factor labeled "wildland protection." While this does not invalidate the factors our analysis exposed, it may indicate the existence of other wildland use issues (such as community and individual uses) that should be included in future applications of the WVS.

## Conclusions

A shift in public perceptions of wilderness may indicate a growing concern for the stewardship of lands already in the NWPS (Hendee and Dawson 2002; Watson et al. 1995) relative to desire for designating more federal lands. A shift toward greater concern for stewardship is consistent with the public's growing interest in the nonuse values of wilderness and in the improvement of the natural condition of extant wilderness areas. Our results showed higher proportions of respondents in 2000 (80% to 90%) relative to 1994 (around 75%) indicating nonuse values to be "very" to "extremely important." These nonuse values include protecting water quality, providing habitat for wildlife, protecting air quality, and supporting endangered species.

Whites, older people, and western residents were significantly more aware of the NWPS, but significantly less likely to agree that we need more acreage than their nonwhite, younger, and eastern counterparts. The recent rapid growth of numbers of older midwestern and western residents may in large part explain the recent seeming decline of support for more wilderness. Projected rapid growth of the younger, eastern, and nonwhite population, however, is likely to be a moderating influence on this trend.

Further supporting the notion that there may be a trend toward greater stewardship of the NWPS is that off-site, nonuse values of wilderness moved even more firmly to the top of the list of 13 values. Combined, those nonuse values at the top of the list in Table 2 form the factor we have labeled "wildland protection." Findings from other studies of environmental values are consistent with these results. There has been speculation that a fundamental shift has occurred in what people

value in forests and other natural environments. This suspected shift is away from the dominant social paradigm (that emphasizes economic growth and human dominance and use of nature) toward a new environmental paradigm (emphasizing sustainable development, harmony with nature, and a balance of human and nonhuman uses and nonuses) (e.g., Bliss, 2000; Steel and Lovrich 1997; Xu and Bengston 1997).

## Discussion

Congressional testimony and other records suggest that much of the original justification for establishing the NWPS focused on use values. In the 1950s and early 1960s, as debates grew more intense about legally creating a wilderness system, there seemed to be an almost endless wildland base. Thus, wilderness, as an aesthetic resource, was not viewed by most people then as being a scarce resource. There were, however, some at that time, such as Howard Zahniser (Scott 2001), who did see clearly the growing scarcity of protected wildlands. But to most Americans, it seems, federal lands represented economic opportunities and raw materials needed to boost the nation's industries. Naturally, selling the concept of a national system of protected lands at that time in our history needed to emphasize use values.

Over the years, as our economy has grown and as we who are fortunate enough to live in this country have prospered, we have looked more and more at natural lands for their beauty, naturalness, and wildness. Much less, it seems, is wilderness valued for its personal or business utility, or even for its use in science. It seems more and more that ecological and existence values are central to Americans' viewpoint on wilderness. It is increasingly

clear that protection of the lands within the NWPS from development and exploitation is what most Americans want (Cordell and Overdevest 2001). Failure to include nonuse values in cost/benefit analyses can clearly underestimate what society sees as most important about the NWPS and lead to biased allocation decisions favoring use of wilderness areas for personal benefits and profits (Loomis, et al. 1995; Oglethorpe and Miliadou 2000; Rolfe et al. 2000).

As our American society works its way into and ultimately through the 21st century, there is a need to pay closer attention to what our society values most about wilderness. It is incumbent upon us as social scientists to continue to ask the public where their values lie. Public Law 88-577 (The Wilderness Act) established the NWPS as a system of wild areas to be protected in perpetuity. A philosophy of wilderness protection, permissible uses, and a range of values are presented in that act. But it is clear in reading the language that a great deal of leeway is given the secretaries of agriculture and interior, and, thus, is given the four agencies charged with managing the NWPS. Therefore, the range of interpretations of what was intended then and what is most appropriate now is quite broad.

Local communities see wilderness as a source of clean water for domestic and agricultural uses. Outfitters, guides, and other commercial service



**Figure 3**—The public has expressed value in protecting endangered species and other wildlife in wilderness. Photo courtesy of Aldo Leopold Wilderness Research Institute.


providers see the scenery and challenge of wilderness areas as the attractions that make their enterprises possible. Mineral extraction and ranching industries see wilderness as lands offering mining and grazing returns, usually at very reasonable costs to the businesses involved. Outdoor equipment manufacturers see wilderness as prime recreation opportunities attracting greater purchases of outdoor sport equipment. Usually, these use interests and the management and policy perspectives so much a part of the culture of federal agencies, are “at the table” when management and allocation issues are being considered. Usually, nonuse interests—that is, the interests of the majority of Americans—are not “at the table.” Research portraying this majority interest allows us to bring that broader American

---

**It seems more and more that ecological and existence values are central to Americans' viewpoint on wilderness. It is increasingly clear that protection of the lands within the NWPS from development and exploitation is what most Americans want.**

---



voice to the table, a voice that is a broader representation of American culture and a greater magnitude of value. 

## REFERENCES

- Bliss, J. C. 2000. Public perceptions of clearcutting. *Journal of Forestry* 98: 4–9.
- Bliss, J. C., S. K. Nepal, R. T. Brooks, and M. D. Larsen. 1994. Forestry community or granfalloon? Do forest owners share the public's view? *Journal of Forestry* 92: 6–10.
- Cordell, H. Ken, and Christine Overdeest. 2001. *Footprints on the Land: An Assessment of Demographic Trends and the Future of Natural Resources in the United States*. Champaign, Ill.: Sagamore Publishing.
- Cordell, H. K., M. A. Tarrant, B. L. McDonald, and J. C. Bergstrom. 1998. How the public views wilderness. *IJW* 4 (3): 28-31.
- Gilbert, A., R. Glass, and T. More. 1992. Valuation of eastern wilderness: Extramarket measures of public support. In C. Payne, J. Bowker, and P. Reed, eds., *The Economic Value of Wilderness*, GTR SE-78. Asheville, N. C.: USDA Forest Service, Southeastern Forest Experiment Station, 57-70.
- Hendee, J. C., and C. P. Dawson. 2002. *Wilderness Management*, 3rd ed. Golden, Colo.: Fulcrum Publishing.
- Loomis, J., K. Bonetti, and C. Echohawk. 1995. Demand for and supply of wilderness. In H. K. Cordell ed., *Outdoor Recreation in American Life*. Champaign, Ill.: Sagamore Publishing, 351–376.
- Mouniford, H., and J. H. Keppler. 1999. Financing incentives for the protection of biodiversity. *The Science of the Total Environment* 240: 133–144.
- Oglethorpe, D. R., and D. Miliadou. 2000. Economic valuation of the non-use attributes of a wetland: A case study for Lake Kerkin. *Journal of Environmental Planning and Management* 43 (6): 755–767.
- Rolfe, J., J. Bennett, and J. Louviere. 2000. Choice modeling and its potential application to tropical rainforest preservation. *Ecological Economics* 35: 289–302.
- Scott, D. 2001. *A Wilderness-Forever Future: A Short History of the National Wilderness Preservation System*. Research Report. Washington, D.C.: Pew Wilderness Center.
- Steel, B. S., and N. P. Lovrich. 1997. An introduction to natural resource policy and the environment: Changing paradigms and values. In B. S. Steel, ed., *Public Lands Management in the West*. Westport, Conn.: Greenwood Publishing, 104–117.
- Tarrant, M. A., and H. K. Cordell. 1997. The effect of respondent characteristics on general environmental attitude-behavior correspondence. *Environment and Behavior* 29: 618–637.
- Walsh, R., J. Loomis, and R. Gillman. 1984. Valuing option, existence, and bequest demand for wilderness. *Land Economics* 60: 14–29.
- Watson, A., D. Cole, G. T. Friese, M. L. Linziger, J. C. Hendee, P. Landres, T. F. Geary, G. L. Stokes, J. Jarvis, and W. Henry. 1995. Wilderness uses, users, values, and management. In H. K. Cordell, ed., *Outdoor Recreation in American Life*. Champaign, Ill.: Sagamore Publishing, 377–402.
- Xu, Z., and D. N. Bengston. 1997. Trends in national forest values among forestry professionals, environmentalists, and the news media. *Society and Natural Resources* 10: 43–59.

H. KEN CORDELL is the project leader of the Recreation, Wilderness, Urban Forestry, and Demographic Trends Work Group of the USDA Forest Service in Athens, Georgia. E-mail: [kcordell@fs.fed.us](mailto:kcordell@fs.fed.us).

MICHAEL A. TARRANT is an associate professor with the Warnell School of Forestry at the University of Georgia in Athens. E-mail: [tarrant@smokey.forestry.uga.edu](mailto:tarrant@smokey.forestry.uga.edu).

GARY T. GREEN is an assistant research scientist with the Warnell School of Forestry at the University of Georgia in Athens. E-mail: [ggreen@fs.fed.us](mailto:ggreen@fs.fed.us).

## Natural Resource Professionals Sharing a Land Ethic

### Our Mission

The Forest Stewards Guild's mission is to promote ecologically and economically responsible resource management that sustains the entire forest across the landscape. The Guild provides a forum and support system for practicing foresters and other resource management professionals working to advance this vision.

### Who We Are

The Guild is comprised of forest resource professionals, students, and ecologically-minded individuals who share a concern for forests and forestry. Collectively, our members manage 6.5 million acres of forest land across the U.S. and Canada.

### Membership

The Guild offers general, affiliate and student memberships. To join or for more information, please visit our website at [www.foreststewardsguild.org](http://www.foreststewardsguild.org) or contact us at Forest Stewards Guild; PO Box 8309; Santa Fe, NM 87504; 1-887-699-0037 or 1-800-MY-WOODS).



### What We Do

The Guild provides a mechanism for members to share their experience with each other and the public. Through conferences, working groups, publications, tours and workshops, the Guild works to bring about change and reform in forestry practice, policy and education.

*Join us in shaping the future of our forests!*

PERSPECTIVES FROM THE  
ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

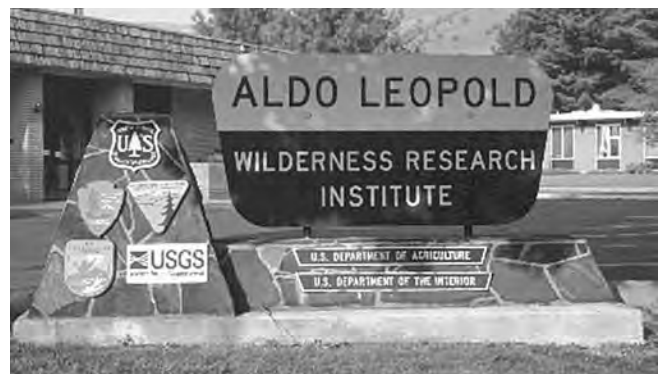
# Natural Fire Regimes in Wilderness

BY CAROL MILLER

All four federal wilderness management agencies (National Park Service, U.S. Forest Service, Fish and Wildlife Service, Bureau of Land Management) formally recognize the importance of fire as a natural ecological process and the desirability of restoring the historical role of fire to wilderness ecosystems (Parsons and Landres 1998). Since the 1970s, well over 1 million acres (405,000 ha) have been allowed to burn on federal lands—the vast majority within designated wilderness or similarly managed national parks.

However, fire suppression has been and continues to be the dominant fire management strategy, even within wilderness. Suppression of lightning ignitions is clearly “trammeling” and therefore runs counter to the intent of The Wilderness Act. Indeed, in many areas suppression has resulted in conditions where the “imprint of man’s work” is quite noticeable in large-scale changes to vegetation and historically unprecedented accumulations of dead fuel (e.g., Arno et al. 1997; Covington and Moore 1994). Fire regimes and vegetation have been significantly altered from their historical ranges on approximately 20% of wilderness acreage outside of Alaska and Hawaii (Schmidt et al. 2002). These conditions could very well lead to fire behavior and fire effects that are arguably “unnatural.”

Wilderness fire managers face unique challenges and opportunities for addressing the effects of fire suppression and the conditions that have resulted from decades of fire exclusion. Manipulative methods that could help reverse the effects of fire suppression (e.g., prescribed fire, thinning, and other mechanical techniques) in designated wilderness are limited by legal and policy constraints, as well as public acceptance. Further, reduced access to the interiors of these areas would severely limit the ability to apply such labor-intensive treatments. On the other hand,



wilderness also provides unique opportunities for fire managers. Wilderness and other unroaded areas hold the greatest potential for using lightning-ignited fires as a strategy for thinning forests and reducing accumulated dead wood and litter. At the same time, allowing lightning ignitions to burn can help satisfy legal and policy mandates to restore natural or historical fire regimes and ecosystem conditions.

Underlying the current fire policies that emphasize the use of natural ignitions is the assumption that lightning-caused fires can indeed restore or maintain fire regimes. To date, this assumption has not been tested. In some wilderness areas, the current condition of vegetation and accumulation of dead fuels may preclude allowing fires to burn because the fire would pose an excessive threat to natural resource values within the wilderness and/or to social values in the adjacent wildland urban interface (WUI). In some areas, particularly small wilderness areas with extensive WUI areas, these approaches may never be feasible. Even in larger wilderness areas, there will always be an argument to suppress some natural ignitions under certain conditions because of these risks. In addition, wilderness does not exist in isolation from surrounding lands. Fires

*Continued on page 48*

# An Evaluation of Appalachian Trail Hikers' Knowledge of Minimum Impact Skills and Practices

BY PETER NEWMAN, ROBERT MANNING, JIM BACON,  
ALAN GRAEFE, and GERARD KYLE

**Abstract:** Visitor information and education about minimum impact skills and practices is an attractive and potentially effective management alternative for minimizing the ecological and social impacts of outdoor recreation. This article examines minimum impact knowledge of Appalachian Trail (AT) hikers. Study findings suggest that AT hikers are relatively knowledgeable about minimum impact skills and practices, but several strategies might be useful in enhancing the effectiveness of information and education programs. Recommendations are made concerning future techniques of assessing visitor knowledge about minimum impact practices and behavior. Study data are drawn from a survey of nearly 2,000 AT hikers in the summer and fall of 1999.

## Introduction

As the number of visitors to parks and wilderness continues to rise, there is increasing concern over impacts to the



Article co-author Peter Newman.

resource and social conditions (see Figure 1). Research suggests that recreation visitors can significantly impact resources through compaction and erosion of soils, trampling of vegetation, disturbance of wildlife, and pollution of streams and lakes (Hammit and Cole 1998). Moreover, increasing use can also degrade the quality of recreation experiences through crowding and conflict and through aesthetic consequences of the resource impacts noted above (Manning 1999). Visitor

information and education programs about minimum impact skills and practices are an attractive and potentially effective management alternative for minimizing the im-

pacts of outdoor recreation. Information and education programs are generally considered light handed because these indirect management practices do not impinge on the freedom of wilderness users, are generally favored by wilderness visitors, and can provide a cognitive basis for appropriate recreation-related behavior in parks and wilderness (Gilbert, et al. 1972; Peterson and Lime 1979; Hendee and Dawson 2002). This article reports on a survey of Appalachian Trail (AT) hikers, including a quiz on minimum impact knowledge, and explores the management and research implications of study findings.

A number of studies have explored the potential effectiveness of information and education efforts in a variety of park, wilderness and related areas (Manning 2003). Although there is a growing body of literature concerning minimum impact education and techniques (see Figure 2), only a few studies have assessed minimum impact knowledge of park and wilderness visitors. For example, a survey of visitors to the Allegheny National Forest found that respondents scored an average of 48% correct on a 12-item true-or-false minimum impact quiz (Confer et al. 1998). Visitors to the Selway-Bitterroot Wilderness scored an

(PEER REVIEWED)



average of 33% correct on a similar quiz (Cole et al. 1997). This paper builds on this growing body of research and explores future directions research might take.

## Study Methods

The AT is a unit of the national park system. Established as the first National Scenic Trail by Congress with passage of the National Trails System Act in 1968, the AT is a continuous, marked footpath extending approximately 2,160 miles along the Appalachian Mountains from the summit of Springer Mountain in Georgia to the summit of Mount Katahdin in Maine. The AT forms a greenway that connects public land areas in 14 states. These public lands include eight national forests, six units of the national park system, and more than 60 state parks, forests, and wildlife areas. Included in the public lands through which the AT passes are 21 units of federally designated wilderness.

A survey of a representative sample of AT hikers addressed a wide range of issues, including visitor knowledge of minimum impact skills and practices. Several questions were on this topic. First, a 10-item true-or-false quiz was designed to test visitor knowledge of minimum impact skills and practices. Items included in this quiz were based on the Leave No Trace program, a formal organization and effort designed to educate outdoor recreation visitors in minimum impact skills and practices (Monz et al. 1994; Marion and Reid 2001). These items were similar to those used in Confer et al. (2000) noted earlier. Although certain questions were related specifically to the AT, they reflected the spirit of recreation use in designated wilderness more generally. Second, respondents were asked about two other minimum impact principles, the mini-

imum distance that (1) human waste should be disposed of from a stream or water source, and (2) campsites should be located from an established trail. The survey also collected information on a variety of hiker characteristics, including type of hiker (day, overnight, AT section, AT thru), geographic region of the trail, demographic characteristics (e.g., gender, education, occupation), and residence (urban, rural).

Sampling occurred in the summer and fall of 1999, along the entire length of the trail. A stratified, systematic sampling procedure was used to obtain a representative sample of all AT hikers, stratified (by time and day of week) in accordance with use estimates provided by the National Park Service and the Appalachian Trail Conference. Every third hiker over the age of 18 was intercepted by volunteers or paid staff and asked to provide his/her name and address to be sent a survey questionnaire. Second, "thru-hikers" (people who hike the entire AT in a single year) were purposively sampled at the northern end of the AT to ensure a sufficient number of cases for this type of hiker. Staff and volunteers at Baxter State Park in Maine asked thru-hikers to complete the survey questionnaire on-site before they finished their hike at Mt. Katahdin.

A total of 2,847 AT hikers agreed to participate in the study (approx-



**Figure 1**—New products, such as this backpacking hammock, allow visitors more camping options while reducing associated resource impacts. Photo by Jeff Marion.



**Figure 2**—Sumping, a lightweight piece of fibreglass screen is used to filter food particles from dishwater; the food particles are packed out and the dishwater is sumped into a cathole or broadcast away from camp. Photo by Jeff Marion.

mately 90% of those asked) and were mailed a questionnaire within two weeks of their visit. Two weeks after the initial mailing, visitors were mailed a reminder/thank you postcard. Visitors who did not return a completed questionnaire within four weeks of the initial mailing were mailed a second copy of the questionnaire. Finally, all nonrespondents were mailed a third copy of the questionnaire at the end of the sampling period.

---

**. . . this study indicates that most hikers on the AT are relatively well informed about a variety of minimum impact skills and practices.**

---

**Table 1. Percentage of Visitors Who Answered Questions Correctly and Quiz Score Means.**

Minimum impact quiz questions and answers (Correct answers in <b>bold</b> )			Day hikers	Overnight hikers	Section hikers	Thru-hikers	All hikers
<b>True</b>	False	When selecting a campsite in obviously impacted areas you should spread activities to places that have not been disturbed.	91	90	87	90	90
<b>True</b>	False	The same rules and regulations apply to the entire Appalachian Trail.	67	71	75	87	73
<b>True</b>	False	When hiking and encountering a horse party you should wait until the horses have come to a stop and then move quickly past them.	69	76	73	74	73
True	<b>False</b>	I cannot ride my mountain bike on the Appalachian Trail, because it is not allowed.	86	87	95	97	90
True	<b>False</b>	While backpacking, you should never camp next to a stream.	64	73	64	60	66
<b>True</b>	False	If I wanted to ride my all-terrain vehicle on the AT, I could do so as long as I stay on the trail.	100	99	100	99	99
True	<b>False</b>	When hiking in remote, lightly used locations it is best to camp on a site with no evidence of previous use to minimize your impact on the wilderness environment.	37	47	49	73	48
<b>True</b>	False	Building temporary fire rings by moving rocks and logs at your campsite is an accepted low-impact behavior.	73	87	90	92	83
True	<b>False</b>	When traveling on existing trails it is best to walk single file and stay on the main path to minimize impact.	99	99	99	99	99
True	<b>False</b>	Hikers should not collect plants and rocks along the Appalachian Trail.	97	98	99	97	97
<b>Mean Quiz Scores</b>			<b>78</b>	<b>83</b>	<b>83</b>	<b>86</b>	<b>82</b>

**Table 2. Overall Percentage of Visitors Who Answered Distance Questions Correctly (Less Than 100 Feet).**

According to accepted minimum impact practices for the AT:	% Reported > 100 feet				
	Day hikers	Overnight hikers	Section hikers	Thru-hikers	All hikers
a. How far from a stream or water source (in feet) should you dispose of human wastes?	76	91	92	97	87
b. How far from an established trail (in feet) should you camp?	49	69	71	74	63

## Study Findings

The sampling and survey procedure yielded 1,879 completed questionnaires representing a 66% response rate. Of the sample, 679 were day users, 597 were overnight users (camping only a few nights), 285 were section hikers (camping several nights to complete a geographic section of the trail), and 318 were thru-hikers.

Study findings for the 10-item quiz of minimum impact skills and practices

are shown in Table 1. Correct answers were coded as a 10 and incorrect answers were coded as a 0, and overall mean scores were reported on a percentage basis that ranges from a possible high of 100% to a possible low of 0%. The overall mean score of all AT hikers was 82%.

Scores varied substantially on individual items, and this might provide some guidance concerning the substantive emphasis on future information and education efforts.

Over 90% of respondents knew that (1) use should be concentrated in obviously impacted areas, (2) all-terrain vehicles are not allowed on the AT, (3) mountain bikes are not allowed on the AT, (4) it is best to travel on existing trails and walk single file, and (5) hikers should not collect plants and rocks along the AT. On only two items did less than 70% of respondents choose the correct answer. Approximately 66% of respondents knew that one should not camp next to a stream, and only 48% of respondents knew that when hiking in a lightly used location, it is best to camp on a site with no evidence of previous use.

Respondent scores on the minimum distance questions were also generally high, but varied substantially (see Table 2). Correct answers were considered as any response of 100 feet or more. Knowledge was quite high (mean score of 87%) about the minimum distance that human waste

should be disposed of from streams and water sources. However, knowledge was considerably lower (mean score of 63%) on the minimum distance campsites should be located from established trails.

Statistical analyses were conducted to test for differences in knowledge of minimum impact skills and practices by hiker characteristics. Few statistically significant differences were found, with most differences related to hiker type and region of the trail. For example, 73% of thru-hikers knew to camp on a site with no evidence of previous use when hiking in a remote, lightly used setting as compared to just under half of overnight and section hikers (see Table 1). Respondents from the southern regions scored lower (72%) than respondents from the northern regions (87%) on the question concerning construction of temporary fire rings.

## Management Implications

Information and education programs represent an attractive management alternative that can potentially reduce the ecological and social impacts of recreation while maintaining visitor freedom of choice. However, effective dissemination of information and education can be challenging, especially at areas such as the AT where visitors are widely distributed geographically and among multiple management agencies and organizations. However, this study indicates that most hikers on the AT are relatively well-informed about a variety of minimum impact skills and practices. The average score on the 10-item quiz administered to a representative sample of hikers along the trail was 82%. This provides baseline information about minimum impact knowledge of AT hikers that will be important to monitor in order to assess longitudinal changes and trends.

In addition to assessing the success of information and education programs, studies such as this one can be helpful in enhancing their potential effectiveness. For example, park and wilderness management agencies and organizations associated with the AT may wish to emphasize topics that are less well understood by visitors (e.g., dispersed camping in low use areas, camping at least 100 feet from established trails) and should target types of hikers who are the least knowledgeable (e.g., day hikers, hikers in the southern regions of the trail). Although it may not be reasonable to expect all day-hikers to be knowledgeable about minimum impact camping practices, day hikers may camp on other trips or evolve to camping at a later time. Even though other studies have addressed the minimum impact knowledge of visitors to several parks, wilderness, and related areas, direct comparisons of scores are not easily made because of differences in study instruments and implementation. However, assessing minimum impact knowledge across areas, regions, agencies, and time may be important, and standardized measures may be warranted. Basic principles of minimum impact knowledge and behavior are now emerging as manifested in Leave No Trace and related programs. In some cases, these principles have been adapted for unique ecosystems (e.g., arctic/alpine areas, deserts, riparian areas). Standardized measures of minimum impact knowledge and skills based on these principles should be developed and periodically incorporated into surveys of visitors to parks, wilderness, and related areas. This practice would allow management agencies to tailor information and education programs to specific topics and types of visitors that warrant the most attention (as suggested in this study).



**Figure 3—Tarp.** This tarp was erected on dry grassy groundcover, shown by research to be more resistant than broad-leaved herbaceous plants found under the denser forest canopies in the background. Photo by Jeff Marion.

It would also allow for monitoring of visitor knowledge over time and across geographic and agency boundaries.

## Future Research

The list of questions developed and used in this and related studies may represent an appropriate starting point for the development of more standardized and universal measures of minimum impact knowledge and skills. However, future research on a variety of conceptual and methodological issues can help inform the development of such measures. Following are some research recommendations:


- Research should focus on determining which behavioral principles are most important and effective in minimizing the ecological and social impacts of outdoor recreation (see Figure 3), and which of principles the public are most and least aware.
- Research should make stronger linkages between visitor knowledge and visitor behavior. Do visitors who are knowledgeable about minimum impact principles behave accordingly? What are the barriers that keep visitors from adopting minimum impact prac-



tices when they are knowledgeable about them?

- Research should examine the validity of measures of minimum impact knowledge. Do surveys of visitors, such as those described in this study, accurately assess the most important elements of visitors' knowledge of minimum impact skills and practices? How easy or difficult should such survey-based quizzes be?
- Once appropriate indicators of minimum impact knowledge are developed, research should focus on the development of appropriate standards of such knowledge. What is the minimum level of knowledge below which management action should be taken?
- How is minimum impact information disseminated and communicated most effectively? Where and how do visitors receive information on park and wilderness use, and what types of messages are most effective in influencing visitor behavior?

As noted earlier, visitor information and education about minimum impact skills and practices are an attractive and potentially effective management alternative for minimizing the ecological and social impacts of outdoor recre-

ation. However, better understanding of visitors' knowledge and associated behavior will allow managers to shape and implement information dissemination programs that are more likely to be effective in protecting park and wilderness resources and the quality of visitor experiences. 

#### REFERENCES

- Cole, D. N., T. Hammond, and S. F. McCool. 1997. Information quantity and communication effectiveness: Low-impact messages on wilderness trailside bulletin boards. *Leisure Sciences* 19: 59–72
- Cole, D. N. 1998. Written appeals for attention to low impact messages on wilderness trailside bulletin boards: Experimental evaluations of effectiveness. *Journal of Park and Recreation Administration*. (Spring): 65–79.
- Confer, J. J., J. D. Absher, A. Graefe, and A. Hille. 1998. Relationships between visitor knowledge of "Leave No Trace" minimum impact practices and attitudes toward selected management actions. *Proceedings—1998 Northeastern Recreation Research Symposium*. 1998 April 5–7; Bottom Landing, NY; USDA Forest Service General Technical Report NE 255, 142–146. Radnor, Pa.
- Confer, J. J., A. J. Mowen, A. R. Graefe, and J. D. Absher. 2000. Magazines as wilderness information sources: Assessing users' general wilderness knowledge and specific Leave No Trace knowledge. In D. Cole, S. McCool, W. Borrie, and J. O'Loughlin eds. *Proceedings—National Wilderness Science Conference: A Time of Change*. U. S. Department of Agriculture, Forest Service, Rocky Mountain Research Station Proceedings RMRS-P-14-VOL4. Fort Collins, Colo. 193–197.
- Gilbert, C. G., G. L. Peterson, and D. W. Lime. 1972. Toward a model of travel behavior: Behavior in the Boundary Waters Canoe Area. *Environment and Behavior* (4): 131–157.
- Hammitt, W., and D. N. Cole. 1998. *Wildland Recreation: Ecology and Management*. New York: John Wiley & Sons.
- Hendee, J., and C. P. Dawson. 2002. *Wilderness Management: Stewardship and Protection of Resources and Values*, 3rd ed. Golden, Colo.: Fulcrum Publishing.
- Manning, R. E. 2003. Emerging principles for using information/education in wilderness management. *IJW* (9): 20–27.
- Manning, R. E. 1999. *Studies in Outdoor Recreation: Search and Research for Satisfaction*, 2nd ed. Corvallis: Oregon State University Press.
- Marion, J. L., and S. Reid. 2001. Development of the United States Leave No Trace programme: A historical perspective. In M. B. Usher, ed., *Enjoyment and Understanding of the Natural Heritage*. Edinburgh, Scotland: The Stationery Office Ltd., 81–92.
- Monz, C. A., C. Henderson, and R. Brame. 1994. *Perspectives on the integration of wilderness research, education and management*. In C. Sydorik, comp. *6th National Wilderness Conference Proceedings: The Spirit Lives*. Santa Fe, N. M.: U. S. Bureau of Land Management, Los Alamos, N. M., 204–207.
- Peterson, G., and D. Lime. 1979. People and their behavior: A challenge for recreation management. *Journal of Forestry* 77: 343–346.

PETER NEWMAN is in the Department of Natural Resource Recreation and Tourism, Colorado State University, 231 Forestry, Fort Collins, CO 80523-1480, USA. E-mail: pnewman@cnr.colostate.edu.

ROBERT MANNING and JIM BACON are in the School of Natural Resources, University of Vermont, Recreation Management Program.

ALAN GRAEFE is with the Leisure Studies Program, The Pennsylvania State University.

GERARD KYLE is in the Department of Parks, Recreation and Tourism Management, Clemson University.

---

Information and education programs represent an attractive management alternative that can potentially reduce the ecological and social impacts of recreation while maintaining visitor freedom of choice.

---


# Bill Bainbridge of South Africa Receives Honorary Doctorate for Wilderness Work

BY DRUMMOND DENSHAM

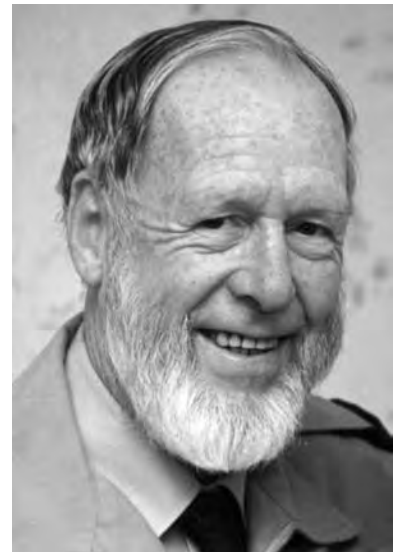
**B**ill Bainbridge, noted wilderness expert (and frequent *IJW* contributor) from KwaZulu Natal in South Africa (SA), received an honorary doctorate of law from the University of Natal on April 12, 2003. Bill is recognized for his distinguished career in conservation, during which he held several senior government posts at both national and provincial levels, always supporting and promoting wilderness conservation. Since retirement from public employment he has worked as an environmental consultant and as a director of the Wilderness Action Group (WAG), an NGO he helped form following the 1983 3rd World Wilderness Congress (WWC) in Scotland.

Bill's appreciation of wilderness stems from his experience in Zambia (1951–1971), where he was responsible for the management of the national parks of Luangwa and Kafue and explored, mostly on foot, the near-pristine big-game (de-facto) wilderness of that beautiful country. Upon returning to SA's Natal, his home province, he began promoting wilderness conservation there in his beloved Drakensberg Mountains. Subsequently, after an amendment to the Forest Act, which enables wilderness designation on state forestland, and encouraged by Bill's active promotion, nomination proposals for four Drakensberg wilderness areas were eventually formalized. The support of NGOs, such as the Mountain Club of SA and the Wildlife and Environment Society of SA, was instrumental to these actions, along with Bill's advocacy personally and through WAG, of which he has been chairman for eight years and vice chairman for five years during its 20-year existence.

Bill has been a delegate and presenter at six WWCs, several times serving on its resolution committee and chairing that committee at the 7th WWC in 2001. He has been a long-standing team member for the Wilderness Concept and Practice Courses jointly presented by the Centre for Environment and Development, University of Natal, and WAG. Recently, Bill helped establish accredited courses on wilderness management and research within the Centre for Environment and Development (University of Natal), the only courses of their kind in Africa and which led to international partnership agreements and eventually to the master's degree program in Protected Area Management Masters first offered July 2002.

Dr. Bainbridge, on behalf of your many wilderness colleagues around the world, the *International Journal of Wilderness* congratulates you on this well-deserved honor. 

DRUMMOND DENSHAM is chairman of the Wilderness Action Group in South Africa and is retired from the KwaZulu Natal Wildlife Services. E-mail: densham@sai.co.za.



Bill Bainbridge.

# Announcements and Wilderness Calendar

COMPILED BY STEVE HOLLENHORST

## South Africa Wilderness Seeks Volunteers

Exciting opportunities exist for experienced wilderness rangers and professionals to become active in South Africa. Host to the smallest of the six plant kingdoms—the Cape Floral Kingdom—the conservation authority, Western Cape Nature Conservation Board (WCNCB), invites volunteers to become involved in the identification, management, and educational aspects of their wilderness. Support is needed to start identifying potential wilderness from the fast disappearing pieces of “unspoiled” land with its abundant diversity. Skills required include path maintenance, rehabilitation, eradication of nonnative species, zonation, staff training, public education, and fund-raising. This initiative started under the umbrella of The WILD Foundation and the Wilderness Foundation (South Africa), after an approach by Pierre van den Berg of the WCNCB. The program promotes international exchanges between wilderness professionals and is viewed as an innovative approach to the challenges facing these reserves. It is also an ideal marketing opportunity for individuals and organizations to take

advantage of the generous gesture of the U.S. volunteers. For more information, please contact Pierre at [gvbosch@telkomsa.net](mailto:gvbosch@telkomsa.net).

## U.S. Plans to Limit Additional Wilderness to 23 Million Acres

The Interior Department wants to limit Bureau of Land Management (BLM) lands eligible for wilderness protection to 23 million acres nationwide, a figure that leaves out millions of acres of roadless area.

In April the department told Congress that it intended to halt all reviews of its western land holdings for new wilderness protection and to withdraw that protected status from about 3 million acres in Utah.

Suspending wilderness reviews would limit the amount of land held by the bureau eligible for wilderness protection at 22.8 million acres. Congress could order additional areas protected.

Interior Secretary Gale A. Norton said that, in 1976, Congress had given the Interior Department 15 years to inventory wilderness areas, and only those areas identified by 1991 as having wilderness characteristics qualified for protection.

Environmental groups said the suspension of wilderness reviews would leave millions of undeveloped acres vulnerable to oil and gas development and off-road vehicle use.

The policy changes come as part of a settlement filed in federal court in Salt Lake City. Utah had sued the Interior Department in 1996 over a reinventory of 3 million acres conducted by the interior secretary at the time, Bruce Babbitt. Norton's announcement means that the department will disregard the results of Mr. Babbitt's 1996 reinventory. That inventory identified 5.9 million acres of Utah land that qualified for wilderness protection, 3 million acres more than were found in the original inventory in the Reagan administration. Sizable parts of the additional 3 million protected acres are red rock canyons and rock formations in southeastern Utah. The settlement is subject to approval by a federal judge in Utah, who also has yet to rule on efforts by environmentalists to intervene in the case.

“It looks like Interior agrees with me and my Western colleagues that the BLM does not have the authority to designate new wilderness study areas,” said Senator Orrin G. Hatch, a Utah Republican. “Secretary Norton's

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



actions will bring resolution to the illegal activities of the past administration.” Source: The Wilderness Society: <http://www.wilderness.org/>.

## **IUCN World Commission on Protected Areas Creates Wilderness Task Force**

The WILD Foundation is pleased to announce that the IUCN's World Commission on Protected Areas (WCPA) recently approved the creation of a new Wilderness Task Force (WTF). WILD played a central role in pushing for the creation of this new task force, which will be cochaired by Vance Martin, president of The WILD Foundation, and Khulani Mkhize, CEO of KwaZulu Natal Wildlife. The WTF's immediate objective will be to integrate wilderness-related issues into discussions at the World Parks Congress in Durban, South Africa, September 2003, and to report on wilderness proceedings after the congress. The WTF will also serve as an important liaison to the 8th World Wilderness Congress, which will likely be held in 2005. The WTF is open to all IUCN members.

The WTF will meet an important and long-standing need. Although wilderness has been a protected areas category (IUCN Category Ib) since 1992, until now there has been no official IUCN forum specifically dedicated to wilderness issues. WILD therefore submitted a proposal for a Wilderness Task Force at the WCPA's meetings in Amman, Jordan, in 2000, and further discussed the proposal with the IUCN at the World Summit on Sustainable Development in Johannesburg in September 2002. WILD is very pleased that the IUCN was able to

establish this task force in time for the meetings in Durban—we believe the new task force will perform an important function, serving as a catalyst both for policy discussions and for conservation results on the ground. For more information, go to [www.iucn.org/themes/wcpa/](http://www.iucn.org/themes/wcpa/) or [www.wild.org](http://www.wild.org). If you are an IUCN member and wish to participate on the WTF, please contact [cyril@wild.org](mailto:cyril@wild.org), with a copy to [vance@wild.org](mailto:vance@wild.org).

## **New Forest/Natural Resources Faculty Chair at SUNY-ESF**

Dr. Chad P. Dawson was appointed March 1, 2003, as the new chair of the Faculty of Forest and Natural Resources Management at the State University of New York, College of Environmental Science and Forestry at Syracuse. Chad is also professor of recreation resources management at ESF, where he teaches outdoor recreation and wilderness management courses and serves as managing editor of the *International Journal of Wilderness*. Among his accomplishments at ESF are earning the SUNY Chancellor's Excellence in Teaching Award in 1995. Chad has authored many articles on recreation and wilderness topics and recently coauthored the textbook *Wilderness Management: Stewardship and Protection of Resources and Values*, 3rd edition (Fulcrum Publishing) with John Hendee in 2002. Chad joined SUNY-ESF in 1989 after working on research and public service projects with Cornell Cooperative Extension, and Minnesota Cooperative Extension Service about tourism and recreation issues. Previously, he was on the research faculty at Cornell University studying the human dimensions of natural resources

management. *IJW* congratulates Chad on his appointment to this important natural resource leadership position.

## **Wilderness Rights-of-Way Restrictions Eased**

A controversial plan to ease restrictions on granting rights of way across U.S. public lands is now in effect. The rule allows roads and highways to be built along any route presently traced by a road or trail, even if the trail is 150 years old and has never been traveled by a motor vehicle. Criticized as a give-away of lands owned by the public, the rule will hit especially hard in Alaska and the West.

The 130-year-old rule (RS 2477 of the 1866 Mining Act), designed to encourage road-building in the Civil War era and repealed by Congress in 1976, has been resuscitated by the Department of the Interior. Beginning January 2003, local and state governments were able to expedite filing claims for rights-of-way under the Civil War-era statute. It enabled the secretary of the interior to transfer rights-of-way to state or local jurisdictions. As a result, state and local governments can make claims on dirt roads, historic wagon trails, hiking trails, and even well-used animal paths to build roads or highways on federally owned lands, including national parks.

According to a 1993 Park Service memo, claims under the road statute could affect up to 17 million acres of national park lands in the lower 48 states, and the state of Alaska has identified 164 routes totaling 2,741 miles in 14 national parks. Source: Environmental News Service. For more information regarding the rule, visit: <http://ens-news.com/ens/jan2003/2003-01-07-06.asp>.

## **WILD Foundation Announces New Vice President**

Cyril Kormos has just joined the team at The WILD Foundation (one of *IJW*'s founding sponsors). Cyril comes to WILD from Conservation International (CI) where he worked for the last six years, most recently as senior director for program management in the President's Office. A native of California, Cyril returns to his home state with his wife, Rebecca, to take on the position of vice president for policy at WILD. Rebecca is a primatologist by training, and an expert on chimpanzees. She is a research fellow for CI's Center for Applied Biodiversity Science.

Prior to his position in the President's Office, Cyril directed CI's Policy Program, during which time he developed considerable experience on a broad range of issues, from multilateral development-bank operational policies, to national parks legislation, to U.S. involvement in international environmental affairs. Cyril has traveled widely, both in southern Africa and Latin America, and has considerable field experience. Projects in Botswana, and in the remote forests of the Guianas Shield, helped develop his wilderness conservation skills. He has also published extensively, including several important pieces on wilderness protection. Cyril has a bachelor's degree in English literature from the University of California at Berkeley, a master's degree in political economy from the London School of Economics, and a law degree from The George Washington University.

Most importantly, Cyril has a strong commitment to wilderness conservation: "We're at a crossroads. Wilderness is disappearing extremely fast, but if we act now, we can still save the planet's last wild places. We

can and must rise to the challenge—a world without wilderness is an impoverished place, in every sense of the word."

## **A Mandate to Protect America's Wilderness**

The Campaign for America's Wilderness recently completed a Comprehensive Review of Public Opinion Research conducted by commercial polling firms, the media, and the federal government from 1999 through 2002. The review reveals that polls consistently, and by wide margins, find that the American people treasure the heritage of wilderness on their public lands and want to see more of it preserved as wilderness. The very high level of support for protecting more wilderness is broadly shared across the political spectrum, all ages and ethnicities, and across demographic groups, including both urban and rural residents.

Strongly held values drive this majority support for protecting more wilderness. These public values go far beyond on-site recreational use of wilderness areas and reflect a strong and fundamental sense of duty to preserve a legacy of wilderness for future generations. Appreciation for the "ecological services" of wilderness—clean water, clean air, habitat for wildlife—were reported and a commitment to protecting wild scenic landscapes to enjoy from the roadside as well as the trail. The public expressed the belief that decisions about the fate of their federal lands—that could be, but are not yet protected as wilderness—should be made in the national interest. The findings of the polls by commercial firms and the media were confirmed by academic surveys and, most notably, in intensive polling done by the

U.S. government. The values reportedly held by survey respondents include (1) a strong and fundamental sense of duty to preserve a legacy of wilderness for future generations, (2) very high appreciation for the ecological services of wilderness, and (3) a commitment to protecting wild scenic landscapes from the roadside as well as the trail. The 44-page report was written by Douglas W. Scott, policy director, and was published in January 2003. This report and others on wilderness preservation are available on the Campaign for America's Wilderness website at [www.leaveitwild.org](http://www.leaveitwild.org).

## **More Support for Protected Areas in Central America**

The protected area systems of all the countries in Central America and the Central American System of Protected Areas will be strengthened with support from their governments. This was agreed upon by the Ministers of the Environment of Central America on the last day of the First Central American Congress on Protected Areas, which was held from March 10–14, 2003, in Nicaragua. In the "Declaration of Managua," the ministers committed to push for a Central American participative policy and strategy for protected areas, and then insisted on the importance of terrestrial and marine protected areas as one of the principal forms of ecosystem and biodiversity conservation in the region. In general, the Ministers of the Environment endorsed the recommendations and conclusions given by the participants of the Congress, which had over 700 representatives from Central America and Mexico, including scientists, government officials, indigenous and rural people, NGOs,

and international organizations, which work with protected areas and natural resources. This event was part of the preparatory process for the 5th IUCN World Parks Congress, which will be held in Durban, South Africa, in September 2003. For more information, visit <http://iucn.org/themes/wcpa/newsbulletins/new.html>.

## Vance Martin Receives NRPS President's Award

President of The WILD Foundation and executive editor of the *International Journal of Wilderness*, Vance Martin has been selected to receive the 2003 President's Award from the Nevada Recreation and Parks Society (NRPS). Vance is being honored for "Outstanding Leadership in Worldwide Conservation." In announcing the award, Bud Solmonsson, president of the NRPS, praised Vance's "leadership for 20 years as president of the WILD Foundation, sponsors of the World Wilderness Congresses, which have convened under his tenure in Scotland, the U.S., Norway, India, and most recently in South Africa in 2001. And beyond those events, WILD, with Vance's personal involvement, has provided leadership to assist several other conservation organizations, including the Cheetah Conservation Fund in Namibia; The International Center for Earth Concerns in Ojai, California; and The Wilderness Foundations of South Africa and Great Britain." A foremost authority on international wilderness, Martin has edited, authored, and coauthored several books and articles on the subject, and has traveled to over 50 countries to study and help establish wilderness, wildlife, and wildland conservation programs. The NRPS, now 50 years old, is the professional state affiliate/chapter of the National Recreation and

Parks Association. Source: Bud Solmonsson, president, Nevada Recreation and Parks Society.

## Nominations Sought For Keith Corrigan Wilderness Stewardship Award

The *International Journal of Wilderness* solicits nominations for the "Keith Corrigan Excellence in Wilderness Stewardship" award to honor persons whose efforts to protect and manage wilderness are worthy of special recognition. The award honors the late Keith Corrigan, who was wilderness branch chief for the Bureau of Land Management during that agency's formative years of their wilderness program from the mid 1980s to mid 1990s.

Keith was a strong leader and advocate for wilderness education, protection of wilderness and wilderness study areas, low impact use of all public lands and wilderness skills training. His influence extended beyond BLM to all the wilderness agencies, universities, and environmental organizations. Keith's quiet determination, passion and high standards for wilderness and all resource management provided leadership and mentoring to all his colleagues and cooperators. Rarely outspoken, he set an outstanding example of dependability, vision and professionalism that charted direction and fostered cooperation.

The "IJW-Keith Corrigan Award for Excellence in Wilderness Stewardship" is given annually to an individual or team of persons whose efforts to protect and/or steward wilderness is worthy of special recognition. Nominees may be professionals or citizens involved in wilderness work. Nominations are solicited until August 30 each year for

the annual award. Submit a 500 word statement and seconding letter to: Steve Hollenhorst, *IJW* editor, "IJW Corrigan Award" ([stevenh@uidaho.edu](mailto:stevenh@uidaho.edu)) describing why the award is deserved, with complete snail mail, e-mail and telephone contact information for the nominee(s) and the person(s) making the nomination.

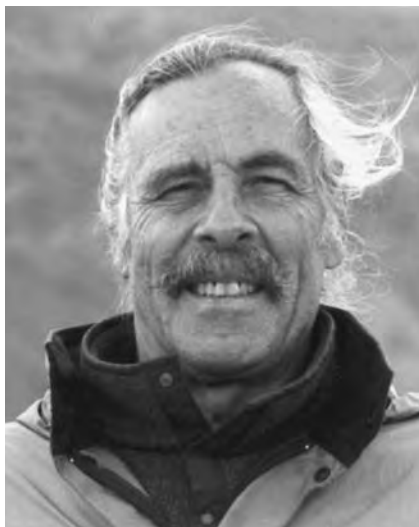
## Minnesota Designates Some State Wilderness in BWCAW

In the spring of 2003, the Minnesota Legislature debated the fate of more than 100,000 acres of state-owned land within the 1.1 million-acre Boundary Waters Canoe Area Wilderness (BWCAW) of northeastern Minnesota. Some northern Democratic state legislators want to force the U. S. Forest Service to exchange the 93,000 acres of state school trust fund land within the BWCAW for most of the federally-owned lands of Superior National Forest outside the wilderness. One such lawmaker also pushed legislation to auction off some of this school trust land within the BWCAW to the highest bidder. These proposals did not ultimately succeed, but an amendment proposed by a Republican state legislator from the Twin Cities region during the debate did remain in the final law signed by the governor. This amendment designates state acquired lands within the BWCAW as state wilderness, the first time that Minnesota has ever designated state wilderness under the statute adopted in 1975 (also see Dawson and Thorndike, 2002, State-Designated Wilderness Programs in the United States, *IJW* 8 [3]: 21-26). The new state wilderness lands within the BWCAW include about 18,000 acres of land from the Burntside State Forest in the Little Sioux Unit of the



BWCAW. The fate of the 93,000 acres of school trust land in the Boundary Waters, however, remains undecided. Source: Kevin Proescholdt (e-mail: kevin-jean@msn.com)

## Steven Foster, Wilderness Rites Of Passage Teacher, Dies



Steven Foster, the most prominent teacher, scholar and author on using wilderness for personal growth thru

rites of passage and modern day vision questing, passed away on May 6, 2003, at age 64 from a genetic lung disorder. A former English and Humanities Professor, Dr. Foster left academia in the early 1970s to seek a more meaningful life. Ultimately, in 1977 he and his wife, Meredith Little, founded a non-profit organization in the San Francisco Bay Area called “Rites of Passage”, to take “at risk” youth on modern-day wilderness vision quests to celebrate their passage from childhood to adulthood.

In 1983, Steven and Meredith moved to Big Pine, California and founded The School of Lost Borders to focus on training rites of passage and wilderness vision quest guides, and Lost Borders Press to publish their work. Since then they trained more than 1,000 individuals from all over the world in diverse skills related to wilderness vision questing and rites of passage in nature, and impacted thousands more thru the subsequent efforts of their trainees. They also published important works on the subject includ-

ing the popular: *Book of the Vision Quest*; the widely used handbook, *The Trail to the Sacred Mountain*; *The Roaring of the Sacred River*; *The Four Shields: The Initiatory Seasons of Human Nature*, reviewed in *IJW* 6 (1); and other works. Dr. Foster contributed an invited article in the inaugural issue of *IJW* in 1995, “The Vision Fast: Therapeutic Use of Wilderness for Self Discovery” *IJW* 1 (1), 27-29.

Lost Border’s courses increasingly drew international participants, and Steven and Meredith were invited to teach in many other countries—their last presentation was at The Jung Institute in Zurich, Switzerland.

On June 14–15, 2003, a celebration of Steven Foster’s life was held in Big Pine, California, attended by 130 people from the U. S. and abroad, with concurrent gatherings in 21 other locations in the U. S. and 6 other countries. *IJW* deeply regrets the loss of Steven Foster, an important pioneer in the use of wilderness for personal growth. Source: John C. Hende, *IJW* Editor in Chief. 🌀



Water lily in the Okefenokee Wilderness Area and National Wildlife Refuge. Photo by Pam Sikes.

# Letters to the Editor

## Dear *IJW* Editor:

Even though it's been a while, I'd like to respond to Naomi and Rebecca Oreskes's well-written response ("Don't Blame Science," *IJW* 7 [1]: 35–38) to my article on controlling nature (*IJW* 6 [1]: 4–8).

First, I'm flattered that anyone responded at all. My common experience is that you grind and sweat and strain to write an article, and if you're lucky it eventually gets published. There follows a short period of profound silence, and by the next month it is forgotten.

So this is an ego-inflating process for me. Anyway, the problem with responses and re-responses is that they get bogged down in accusations of misinterpretation. You get stuff like, "Cronon says that I said that he said that wilderness is a worthless construct, but I said that what he said was worthless as a construct ..."—that kind of thing.

So I'll try to avoid that (even though, of course, Oreskes and Oreskes somehow did indeed misinterpret every single word of all my perfectly clear points, and they must

have read my article during the 34th straight hour of riding a Greyhound bus from New Hampshire to Mexico City to have misunderstood it so wildly).

Seriously, the big point we may agree on is that the process of science has been co-opted, or maybe corrupted, by corporate interests. I'm not sure how badly they feel it has been corrupted. I feel it has been very badly corrupted.

Second, I feel that science, as a corrupted *institution*, is way overtrusted by almost everyone. I don't really disagree with the idea of science and the beauty of discovery and the true joy that some scientists find in that. But most of the science I see here at my university is driven by whatever grant money is available. We've got scientists trying to figure out ways to grow 50 more kernels of corn on a 100-acre plot, or make a brake pad with 2% more friction than the old one, or find ways to get the 20 to 25 year old market to buy more Gore-tex clothes.

Regarding ecological restoration, I'm merely mistrustful of how easily it, too, can be corrupted. I feel the

example I gave is about perfect. A certain agency devoted to scientific resource management came up with an identical plan for some heavy tree-cutting three or four different times, each time with merely a new name. The last time, it was called "ecological restoration."

I'm in favor of trying ecological restoration (who isn't?), especially when that's the true goal and not a pretext. I do think there's a bit of hubris involved, though, if we think we know enough to reconstruct systems that evolved over eons. And I think we should be more honest about that.

Lastly, I'm simply a big fan of leaving more places alone. By doing so, I do not see how things could go any more wrong.

And I only advocate a wee bit of Eastern philosophy, a tiny bit of *non-action*, here and there—a few places we can still visit, look around, and say, "out here, nothing is possible." 🌀

JAMES GLOVER, professor in the Department of Health, Education and Recreation at Southern Illinois University, Carbondale. E-mail: jglover@siu.edu.

# Book Reviews

## ***Natural Area Tourism: Ecology, Impacts and Management***

By David Newsome, Susan A. Moore, and Ross K. Dowling. 2002. Channel View Publications, Clevedon, U.K. 400 pp., \$29.95 (paper).

The main objective of *Natural Areas Tourism* is to overcome the existing perception that tourism developments in environmentally sensitive areas are inherently adverse. The authors offer the view that with adequate foresight, planning, and management, tourism development creates increased awareness and conservation of natural areas.

The book is divided into eight chapters. Following an Introduction, Chapter 2 provides a synthesis of basic ecosystem functions and processes and is primarily intended for nonspecialists on ecological issues. Chapter 3 provides an account of the environmental impacts of tourism in natural areas, with a focus on sources of impacts caused by the development and operation of transport and travel, accommodation and shelter, and recreational activities. Chapter 4 discusses visitor planning and management frameworks. The utility and applications of concepts such as carrying capacity, Limits of Acceptable Change, the Recreation Opportunity Spectrum, Visitor Impact Management, and Tourism Optimization Management models are discussed. Chapter 5 describes management strategies and actions applied in national parks and other protected areas. Chapter 6 considers the principles and application of interpretation in relation

to providing minimal impact messages and fostering sustainable tourism. Chapter 7 discusses visitor impact monitoring techniques, with special emphasis on backcountry recreation areas. The final chapter assesses the future links between natural area tourism and ecology; the types, scale, and range of impacts; and trends and issues in management of natural area tourism.

This book is a welcome addition to the growing body of literature on biophysical impacts of tourism, as there is a lack of good textbooks on ecological impacts of tourism, especially for students without an ecology background. From this perspective, this well-written book will suit tourism students and instructors. Particularly useful are the suggestions for further readings listed at the end of each chapter. While the book does not break any new ground, it is successful in gathering the relevant literature and presenting it in a systematic and coherent manner. It also demonstrates the usefulness of and link between outdoor recreation research and nature-based tourism issues.

Although the book claims to be about ecological impacts and management of tourism in natural areas, the book is essentially about outdoor recreation impacts in wilderness and backcountry areas; Chapters 4 through 7 are heavily dependent on existing literature on outdoor recreation research. Also, the focus on North American and Australian case studies could make the book less appealing to a wider international audience. The concluding chapter could have been strengthened

by tying together various findings discussed in the previous chapters, identifying key issues and concepts, and discussing emerging research approaches and applications in the broader aspects of nature tourism.

Despite these shortcomings, I found the book very useful in demonstrating how studies in outdoor recreation have contributed to the understanding of ecological processes in natural settings modified by recreation and tourism activities. I would certainly recommend it as a textbook for visitor impact management.

Review by SANJAY K. NEPAL, Geography/Resource Recreation and Tourism Program, University of Northern British Columbia. E-mail: nepals@unbc.ca.

## ***Sustainable Tourism in Protected Areas: Guidelines for Planning and Management***

By Paul Eagles, Stephen McCool, and Christopher Haynes. 2002. IUCN—The World Conservation Union, Cambridge, U. K. 183 pp., \$26.25 (paper).

As tourism grows in economic importance around the world, protecting the natural and cultural areas that are the foundation of *sustainable* tourism becomes essential. If these areas are not protected, the quality of visitor experiences declines, and, eventually, levels of visitation decrease as well. This message comes through clearly in *Sustainable Tourism in Protected Areas*. With support from the World Conservation Union (IUCN), Cardiff University,

Environment Australia, the United Nations Environment Programme, and the World Tourism Organization, the authors of this text have undertaken the difficult task of developing guidelines for tourism in protected areas. The authors not only discuss why protection is needed, but how we—as tourism educators, planners, and managers—can effectively establish tourism programs and experiences that minimize impacts and protect the resources on which tourism thrives. The outcome of their efforts is a comprehensive text that is well written, interesting, concise, and supported by short case studies.

Guidelines are included in the book in both text and table format. The word *guidelines* is highlighted throughout the book for quick identification. Guidelines are included for issues such as creating park policies, identifying tourism planning objectives, developing infrastructure and services, and monitoring tourism programs.

Numerous case studies, presenting examples of natural and cultural tourism from around the world, are spread throughout the book. Areas with varying levels of visitation and tourism development (e.g., Galapagos National Park in Ecuador and Chumbe Island Coral Park in Tanzania) are included. Several case studies also present information about the activities of non governmental organizations such as The Nature Conservancy.

*Sustainable Tourism in Protected Areas* will appeal to a diverse audience. Tourism planners, entrepreneurs, and managers will appreciate the inclusion of topics such as establishing fee structures at tourism attractions, monitoring tourism impacts, and increasing public involvement in tourism efforts. College students and educators will appreciate the book's well-organized approach to tourism planning and management, and the diverse case studies that are included. This

book is suitable for tourism professionals and students working in developed as well as developing countries.

In addition to the factual content and organization, I appreciated the design of the publication. Rather than extensive paragraphs of text on each page, a combination of concise paragraphs, numerous tables, full-color photographs, and case-study sidebars are used throughout, making this book enjoyable to read and suitable for its diverse audience. Though an index is not included, the organization of the text combined with a complete table of contents make this book user-friendly. A list of references related to tourism and protected areas is included. I liked how the authors carefully integrated the protection of cultural resources with that of natural resources, presenting a comprehensive view of tourism planning and management that effectively includes the human element. Overall, I would strongly recommend this book to anyone involved in *sustainable* natural or cultural tourism planning or management.

Review by DIANE KUEHN, assistant professor, State University of New York, College of Environmental Science and Forestry, Syracuse, N. Y. E-mail: dmkuehn@esf.edu.

### ***Wilderness Management: Stewardship and Protection of Resources and Values (3rd ed.)***

By John C. Hendee and Chad P. Dawson. 2002. International Wilderness Leadership (WILD) Foundation and Fulcrum Publishing, Golden, Colo. 640 pp., \$65.00 (paper).

Wilderness protection advocates, once they have figured out how to hold this three-pound tome in their laps comfortably, will find it surprisingly reassuring

to read. It offers a welcome contrast to the anxious e-mail we receive from colleagues daily that describe the latest campaigns to erode wilderness integrity and what political countermeasures to take. Its historical and global perspectives encourage the reader to breathe deeply, count to ten, and take some well-deserved pleasure in considering how far we've come, from the initial 9-million-acre "instant" National Wilderness Preservation System (NWPS) of 1964 to today's far-flung 106-million-acre NWPS, and to the active pursuit of the wildland-protection goal in Canada and many other corners of the Earth. It even provides an optimistic view of our chances of seeing a 200-million-acre system in place in the United States one of these days, through the addition of major chunks of national park backcountry and more contributions from the Bureau of Land Management, particularly in Alaska. Most usefully, it systematically traces the evolution of professional thinking as to how to manage wilderness. Given the "minimum tool" rule—stated as "guardians, not gardeners" by Howard Zahniser—the authors steer a commonsense middle course (at least in my view) between the guardians and the gardeners.

The new edition was written by John C. Hendee, former dean of the University of Idaho's College of Natural Resources, and Chad P. Dawson, chair of the Faculty of Forest and Natural Resources Management at SUNY-College of Environmental Science and Forestry. An Acknowledgements section at the end of each of 17 chapters identifies both the author(s) of the original version in earlier editions and those who helped write or review the new chapters for this edition. The roots of this book go back to a 1971 U.S. Forest Service wilderness research symposium. The first edition (1978),



coauthored by Hendee, George H. Stankey, and Robert C. Lucas, was sponsored by the Forest Service and published by the Government Printing Office. Fulcrum Publishing of Golden, Colorado, produced both the second (1990) and this third edition. Vance G. Martin, president of the International Wilderness Leadership Foundation, wrote both the publisher's Preface and (with Alan Watson) an encouraging chapter on international wilderness. No stone is left unturned in the pursuit of an encyclopedic review of the topic of wilderness management.

For the teacher, study questions and references are offered at the end

of each chapter. I can see this book being effectively used as the textbook for a 10-week college course or a weeklong in-service training session for those who see wilderness as either their vocation or avocation (e.g., trail maintenance volunteers). For resource management professionals and laypersons alike, it paints a comprehensive picture of the history of wilderness designations, the complexities of wilderness management in the face of an expanding human population, and what the future may hold in this regard. I salute Vance Martin and the International Wilderness Leadership Foundation for

sponsoring the thorough updating and republishing of this unique reference work on the state of the planet's wilderness resources. 🌀

Reviewed by RUPERT CUTLER, who currently resides in Roanoke, Virginia, and was elected to the Roanoke City Council in 2002. As the assistant secretary of agriculture for conservation, research, and education in the administration of President Jimmy Carter, Dr. Cutler provided wilderness management policy direction and initiated the RARE II roadless area review process at hearings on the Endangered American Wilderness Act of 1978. E-mail: mrcutler@aol.com.

---

## From ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE on page 33

---

that start in surrounding areas and otherwise would spread into wilderness are usually suppressed, further limiting the amount of natural fire that occurs within wilderness.

Wilderness fire managers strive to restore or maintain fire as a natural process and they need to know whether they can actually accomplish this objective. We are helping wilderness managers assess whether lightning-caused fires can indeed restore ecosystem conditions and fire regimes in wilderness. In those areas where lightning-caused fires can be allowed to burn, we are developing computer tools that will allow managers to evaluate if there are enough

ignitions for restoring the natural or historical fire regime. In addition, we are attempting to quantify the effect that suppression activities outside of wilderness can have on efforts to maintain natural fire regimes inside of wilderness. 🌀

### REFERENCES

- Arno, S. F., Smith, H. Y. and M. A. Krebs, 1997. Old Growth Ponderosa Pine and Western Larch Stand Structures: Influences of pre-1900 fires and fire exclusion. USDA Forest Service Research Paper INT-495. Intermountain Research Station.
- Covington, W. W. and M. M. Moore. 1994. Southwestern ponderosa forest structure and resource conditions: Changes since Euro-American settlement. *Journal of Forestry* 92: 39-47.

Parsons, D. J. and P. B. Landres. 1998. Restoring natural fire to wilderness: How are we doing? In T. L. Purden, and L. A. Brennan, eds., *Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription*. Tall Timbers Conference Proceedings No. 20. Tallahassee, Fla. Tall Timbers Research Station, 366-373.

Schmidt, K. M., J. P. Menakis, C. C. Hardy, W. J. Hann, and D. L. Bunnell. 2002. *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management*. General Technical Report RMRS-GTR-87. Fort Collins, Colo.: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

CAROL MILLER is a research ecologist, Aldo-Leopold Wilderness Research Institute, P. O. Box 8089, Missoula, MT 59807 USA. E-mail: cmiller04@fs.fed.us.