INTERNATIONAL

# JOURNAL OF WILDERNESS

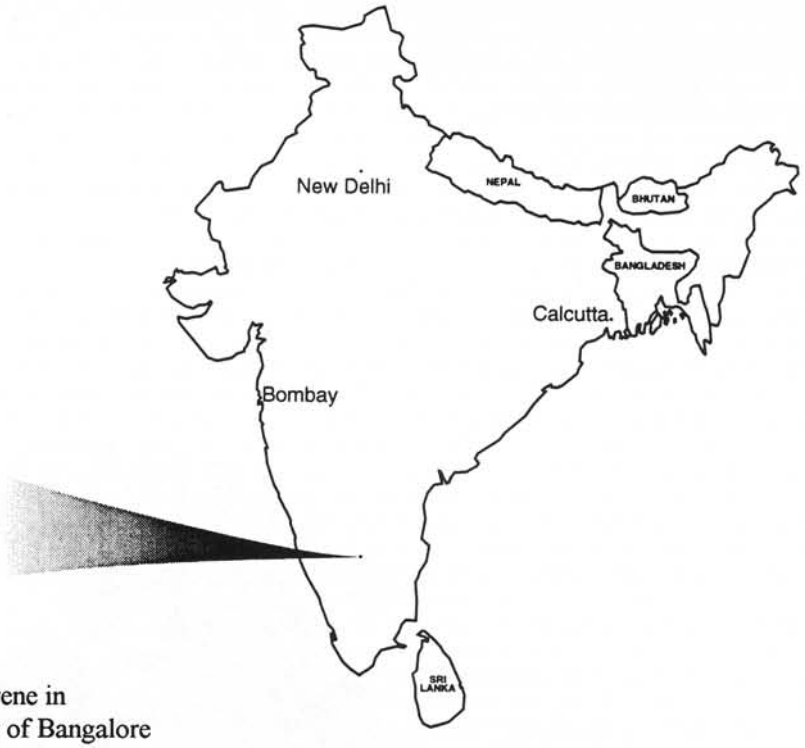
## CONTENTS



INAUGURAL ISSUE VOLUME 1, NUMBER 1


**Inaugural Issue, September 1995, Volume 1, Number 1**

# 6th World Wilderness Congress




# Bangalore, India October, 1997

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

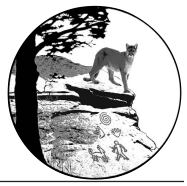
- the conflict of increasing human populations with wildlife and wildlands;
- new policies and programs to save endangered species;
- a framework for wilderness legislation appropriate to safeguard wildlands and their dependent indigenous societies in Asia;
- a concept of sustainable living and appropriate quality of life;
- the need for increased training of youth, for involvement in conservation;
- models of development which draw from the benefits of science, the inheritance of culture, and the wisdom of nature.

For information and registration:

North and South America:
The WILD Foundation
International Center for Earth Concerns
2162 Baldwin Rd
Ojai, CA 93023 USA
fax (805) 649-1757

Europe, Asia, Africa, Pacific:
"Hamsini"
12th Cross
Rajmahal
Bangalore 560 080 India
fax (080) 334-1674

INTERNATIONAL
# JOURNAL OF WILDERNESS
INAUGURAL ISSUE, SEPTEMBER 1995 VOLUME 1, NUMBER 1



## FEATURES



## PLANNING AND MANAGEMENT



## EDUCATION



Cover photograph of Sami woman by Vance G. Martin.

## SCIENCE AND RESEARCH



## INTERNATIONAL PERSPECTIVES



## WILDERNESS NEWS AND CALENDAR

# International Journal of Wilderness



**EXECUTIVE EDITORS**

Alan W. Ewert, University of Northern British Columbia, Prince George B.C.
Vance G. Martin, WILD Foundation/ICEC, Ojai, Calif.
David Porter, Bureau of Land Management, Lakewood, Colo.
Alan E. Watson, Aldo Leopold Wilderness Research Institute, Missoula, Mont.
James R. Fazio, University of Idaho, Moscow, Idaho

**MANAGING EDITOR**

John C. Hendee, Director, University of Idaho Wilderness Research Center, Moscow, Idaho

**PRODUCTION EDITOR**

Michelle S. Mazzola, University of Idaho Wilderness Research Center, Moscow, Idaho

**ASSOCIATE EDITORS**

Liz Close, *U.S. Forest Service, Missoula, Mont.,* Dave Cockrell, *University of Southern Colorado, Pueblo, Colo.,* Dave Cole, *Aldo Leopold Wilderness Research Institute, Missoula, Mont.,* Don Duff, *U.S. Forest Service, Salt Lake City, Utah,* William Forgey, *Medical Doctor, Crown Point, Ind.,* Nancy Green, *U.S. Forest Service, Washington, D.C.,* Glen Haas, *Colorado State University, Fort Collins, Colo.,* Dave Harmon, *Bureau of Land Management, Portland, Oreg.,* Steve Hollenhorst, *West Virginia University, Morgantown, W. Va., Jon Jarvis, Wrangell-St. Elias National Park, Glennallen, Ark.,* Kris Kennett, *British Columbia Parks, Loiliaras Lake, B. C., Canada,* Jamie Kirkpatrick, *University of Tasmania, Hobart, TAS, Australia,* Ruthann Knudson, *National Park Service, Washington, D.C,* Ed Krumpe, *University of Idaho, Moscow, Idaho,* David Lime, *University of Minnesota, St. Paul, Minn.,* Bob Manning, *University of Vermont, Burlington, Vt.,* Joe Mazzoni, *U.S. Fish & Wildlife Service, Albuquerque, N.M.,* Michael McCloskey, *Sierra Club, Washington, D.C.,* Jonathan Miller, *Australian Heritage Commission, Australia,* Chris Monz, *National Outdoor Leadership School, Lander, Wy,* Bob Muth, *University of Massachusetts, Amherst, Mass.,* Connie Myers, *Arthur Carhart Wilderness Training Center, Huson, Mont.*, Roderick Nash, *University of California, Santa Barbara, Calif.,* Max Oelschlaeger, *University of North Texas, Corrales, N.M.,* Margaret Petersen, *U.S. Forest Service, Portland, Oreg.,* Joe Roggenbuck, *Virginia Polytechnic Institute, Blacksburg, Va.,* Holmes Rolston III, *Colorado State University, Ft. Collins, Colo.,* Mitch Sakofs, *Outward Bound, Garrison, N.Y.,* Susan Sater, *U.S. Forest Service, Portland, Oreg,* Tod Schimelpfenig, *National Outdoor Leadership School, Lander, Wy,* Alan Schmierer, *National Park Service, San Francisco, Calif, Won* Sop Shin, *Chungbuk National University, Chungbuk, Korea,* Jerry Stokes, *U.S. Forest Service, Washington, D. C.,* Ralph Swain, *U S. Forest Service, Fort Collins, Colo.* Jay Watson, *The Wilderness Society, San Francisco, Calif,* Tom Zimmerman, *National Park Service, Boise, Idaho*



*International Journal of Wilderness* (IJW) will be launched in 1995 with two issues (September and December). Look for three issues in 1996 (April, August, and December) and full-production of quarterly issues thereafter (March, June, September, and December).

Manuscripts and Production: University of Idaho, Wilderness Research Center, Moscow, ID 83844-1144, USA; (208) 885-2267. Fax: (208) 885-2268. e-Mail: wrc@uidaho.edu.

Business Management and Subscriptions: WILD Foundation, International Center for Earth Concerns, 2162 Baldwin Road, Ojai, CA 93023, USA. Fax: (805) 649-1757. e-Mail: WILD@FISHNET.NET

Subscription rates: Subscription costs are in U.S. dollars only—$30 for individuals and $50 for organizations/libraries. Subscriptions to California and Mexico add $10; outside North America add $20.

For advertising rates please contact Michelle Mazzola @ the University of Idaho, Wilderness Research Center, FWR Room 18-A, Moscow, ID 83844-1144, USA; (208) 885-2267. Fax: (208) 885-6226. e-Mail: wrc@uidaho.edu.



All materials printed in the *International Journal of Wilderness* copyright © 1995 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.


Mission: The *International Journal of Wilderness* seeks to link wilderness professionals, scientists, educators, and interested citizens, worldwide with a forum for reporting and discussing wilderness research; inspirational ideas; planning, management, and allocation strategies; education; and practical issues of wilderness stewardship.

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 calendar are encouraged. A complete list of manuscript submission guidelines can be found toward the end of this journal.

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

Reprints: Manuscript reprints are available from the production office for a nominal charge.

Printed on recycled paper.


**SPONSORING ORGANIZATIONS**

• Aldo Leopold Wilderness Research Institute • America Outdoors (National Outfitters and Guides Association) • International Center for Earth Concerns (ICEC) • International Wilderness Leadership (WILD) Foundation • National Outdoor Leadership School (NOLS) • Outdoor Recreation Coalition of America (ORCA) • Outward Bound • Society of American Foresters—Wilderness Work Group • The Wilderness Society • University of Idaho Wilderness Research Center • University of Northern British Columbia (Faculty of Natural Resources and Environmental Studies) • U.S.D.A. Forest Service • U.S.D.I. Bureau of Land Management • U.S.D.I. Fish and Wildlife Service • U.S.D.I. National Park Service • Wilderness Education Association • Wilderness Inquiry • Wilderness Watch

# The Time is Right

WELCOME TO VOLUME ONE, Issue One of the *International Journal of Wilderness* (IJW). For many of us, this journal is a dream come true—an international voice integrating the wilderness and wildland concerns of scientists, planners and managers, educators, and citizen environmentalists, worldwide.

The idea of a wilderness journal has been discussed for twenty years. Now the time is right! Wilderness interest and effort is broadly based and spans the globe. The United States, Australia, South Africa, Canada, and Finland legally designate wilderness. New Zealand and Zimbabwe administratively zone and protect wilderness. Botswana, Namibia, and Italy recognize wilderness. Russia, through its Zapovednik system, Brazil, through its indigenous and extractive reserves, and Antarctica, through pressure from many nations are protecting wilderness values and sites.[1]

Wilderness stewardship is emerging as an important natural resource specialty supported by a textbook and numerous reference books, correspondence study curricula, annual conferences in the United States, and World Wilderness Congresses which have convened on five occasions in five different countries.

The IJW is an outgrowth of this global rallying interest in wilderness issues. Appropriately, IJW is being launched as a partnership, led by a team of executive editors—wilderness leaders contributing their professional energy and talents, associate editors providing technical reviews, organizational sponsors providing start-up support and funding, and advertisers investing in the vitality of wilderness consumers.

John C. Hendee

It will not be easy integrating the diverse wilderness interests of planners and managers, scientists, educators, and citizen environmentalists. To provide substance for everyone, the IJW will include topical feature articles plus peer-reviewed manuscripts on wilderness planning and management, science, and education. Look, too, for invited articles on important global wilderness concerns, debate on contentious wilderness issues, book reviews, a wilderness calendar, announcements, internet reviews, and letters to the editor.

Join the wilderness dialogue with us, expand your networks and send us your feedback, ideas, and material. Please share this inaugural issue with a colleague. We look forward to hearing from you.

—John C. Hendee, Managing Editor

[1]Details of wilderness protection efforts around the world are outlined in several articles by Vance Martin, president, International Center for Earth Concerns and The WILD Foundation, 2162 Baldwin Road, Ojai, CA 93023, USA.

> "A journey into the wilderness is a test of the will against the odds. Going into the wilderness, *any* wilderness, is a way of opening yourself to the possibility of danger and to the likelihood of discomfort, at least. There is the possibility of getting lost, of being trapped in a storm, of confronting *an* angry animal or falling. There *are* certain hardships of arduous walks, of exposure to cold, heat, wind, rain, of sleeping on the ground, of solitude. To be alone is sometimes the most difficult challenge of all. It is in itself *an art,* for which we are ill equipped, both by training and by experience. To confront the unknown and meet its challenges is to be admitted into a permanently enlarged world. ... so our encounters with the wilderness widen us and free us."
>
> —from *The Necessity of Empty Places* by Paul Gruchow

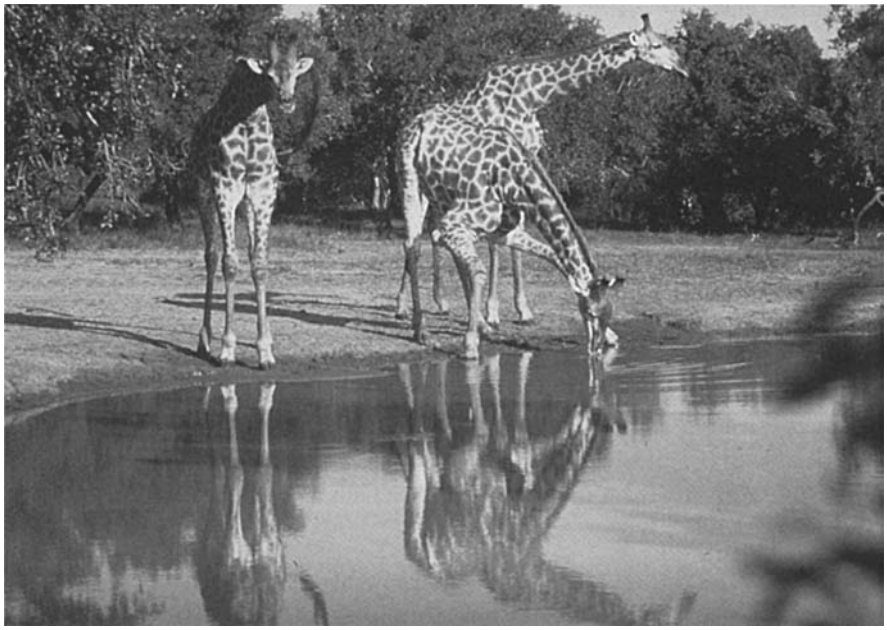
**Are You On e-Mail?**

Now you can use e-mail to talk with us. Let us know what you think about the *International Journal of Wilderness* recent articles, features, research, etc. Let us hear from you—write a letter to the editor for the next issue. The IJW e-mail address is wrc@uidaho.edu.

# Soul of the Wilderness—

## *"What Happens to the Birds and Animals May Happen to Us!"*

**BY IAN PLAYER**



*Giraffe (left). Photo credit: Trevor Barrett. Dr. Ian C. Player (above), former game ranger and chief conservator (Zululand) in the South African province of Kwazulu/ Natal, led the team which saved the white rhino from extinction through translocation to zoos throughout the world.*

IN THE AUTUMN OF 1975, my Zulu friend and mentor, Qumbu Magqubu Ntombela, and I were leading a group of six people into the brooding savannah country of the Umfolozi wilderness. Magqubu was born and raised in what is today known as the Umfolozi Game Reserve, and he knew the country thoroughly. Not only did he know about the animals, the birds, and the trees, but he also knew about the history of his people.

> It is time that we have a big Indaba (gathering) of all the people ... from all over the world and in this way begin to help and educate more people to save wild country.
>
> —Magqubu Ntombela

One night we camped beneath a huge sycamore fig tree and sat around the fire. I clearly remember that night because the lions were roaring downstream, the rhino were shuffling on a path that led close to where we were sleeping, the hyena were whooping in the hills, the jackals were hunting and calling, and the bushbuck antelope were barking all around us. When I looked up into the great Southern Galaxy, I saw the Southern Cross, which is to Africans, Australians, and New Zealanders what the North Star is to Europeans. It was a wonderful, magical African night, and I intuitively knew that something significant was going to happen.

Magqubu, who was 75 years old, began to tell us stories. What a wonderful storyteller he was. He told us how he grew up in the Ongeni area, learning from his father and the old men in his krall (home), the meanings of Hlonipho, which implies respect for all things, including people, tradition, plants, animals, and ancestral spirits, and Ubuntu (compassion). Magqubu said that the spirits of the old people who lived in the Umfolozi are guarded by the snakes in the isolated ravines, and that the spirits were there to protect us and look after the wild country.

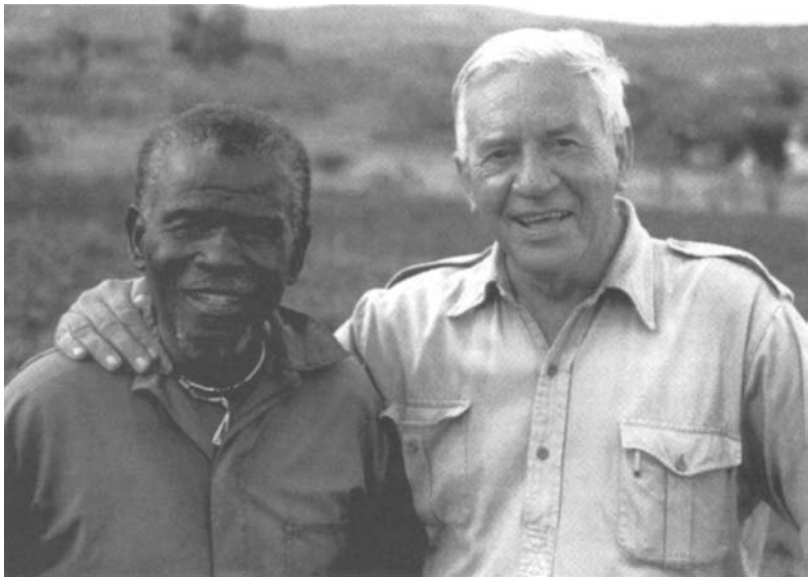
He went on to tell us about the Zulu months of the year, a poetic description of the seasons. He said that April was Mbasa, which is the time to make fires and move inside the huts. July is Ntulikazana, when the winds first come and blow the leaves off the trees. August is Nhloyiwe, when the yellow-billed kite comes down from the north; the name of the month is derived from the onomatopoeic sound of the birds calling. September is Ulwezi, which means that when you look across the landscape, it is like looking through a spider web because of the first fires that have begun in the land. October is uZibandlela, when the grass starts to grow over the paths; and December is kNkonkoni, when the wildebeest begin to calve.

That night, as I sat alone at the fire on watch to keep the lions away, I thought how wrong it was that a man with such insights and knowledge as Magqubu was not more widely known. He could not read or write, but he was a brilliant naturalist and orator. So, it was that night, sitting around the fire underneath the Southern Cross, that the idea of a world wilderness congress was born. Strangely, and yet maybe not, the next morning, Magqubu said to me: "You know, it is time that we have a big Indaba (gathering) of all the people that we have brought out here, so that we can join them together from all over the world and begin to help and educate more people to save wild country." This confirmed my feeling of the previous evening and I decided that the moment I got back into town I would begin to create a World Wilderness Congress (WWC).

The effort to organize took two years, and in October 1977, in the midst of some of the worst apartheid years in southern Africa, and during the infamous Soweto riots, the congress took place. This was a miracle. There were some 40 international speakers in attendance, including artists, poets, hunters, musicians, and writers. For me, one of the most important aspects of the congress was seeing Magqubu and other indigenous people, who had dedicated their entire lives to nature conservation, on the same platform as leading politicians and environmental and cabinet ministers.

The 1st WWC renewed strength in the international movement to understand and protect wilderness. The 2nd WWC was held Cairns,

Australia, in 1980; in 1983, the 3rd WWC was held in the Scottish Highlands at Inverness and Findhorn; in 1987, the 4th WWC was held in the United States; in 1993, the 5th WWC convened in the Arctic, in northern Norway. The 6th WWC is planned for India in 1997. Each congress brings together those of us who know the values of wilderness and who especially understand the power of wilderness experiences to transform human lives to help solve the world's current spiritual and ecological plight.



Ian Player and Magqubu Ntombela in the Zululand wilderness.

Those who are committed to the wilderness must confront barbaric people and ideas. I use the word "barbaric" carefully, but purposefully, because there are insensitive developers and mining companies, and incompetent governments, that have no feelings for anything wild and seem to think that they have the God-given right to do anything they wish to the world. Yet, ironically, without wilderness and wildlife, many people could not maintain their sanity.

In 1955, when I was a young game ranger in Zululand, stationed in the Umfolozi Game Reserve, I spent many days walking down the White and Black Umfolozi rivers talking with the old Zulu game guards about the history of the wonderful landscape. It was at this time too, thanks to my friend, Jim Feely, who was a great admirer and reader of American wildlife literature, that I was able to read about the ten fundamental principles of the wilderness concept in a book on wildlife management by a man called Tripensee. It was without question one of the most remarkable reading experiences that I have ever had. For the previous three years, I had been working in the wild country of Zululand and now suddenly reading these ten fundamental principles became for me a fusion of Logos and Eros. The words described what I had experienced during my foot, canoe, and horse patrols in Zululand and other wild country that I had explored.

Since then, there has been an explosion of wilderness literature. Authors Paul Shepard, Theodore Roszak, Max Oeschlager, Rod Nashjohn Hendee, and many others have given the world the opportunity to read about the importance of wilderness to humankind. We have now reached the point in human history where we have no excuse not to defend wilderness and wildlife. It is imperative that we save the wilderness because our own survival depends upon it.

*We are certainly going to need the help of the Great spirit of the American Indian peoples, Nkulukulu of the Zulu people, and the god of the Western world to keep us from destroying nature and its bounty and thereby destroying ourselves.*

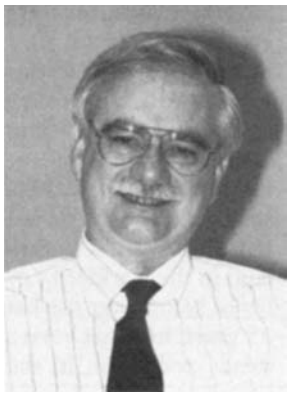
Major disasters are evident all around us. I recently watched a television documentary about amphibians and how they are disappearing from the world. I instantly knew that this was true. In my own homeland in the Karkloof Valley of Natal, over the last 25 years there has been a steady reduction in the number of toads and frogs. When my family first moved into the valley, after the early rains we could hardly sleep because of the noise of the frogs. We don't hear them much anymore. What does this and other stories of ecological disintegration tell us? Which shadow announces the death of the afternoon? We need to listen to what the animals and the birds are telling us because they are the indicators of what might happen to us.

I ask you to pause for a moment and think, not only of the wild places and animals that are being destroyed, but also of the indigenous peoples of the Kalahari, the central African forests, the South American forests, and Asia. We must also consider the powers greater than ourselves. We are certainly going to need the help of the Great Spirit of the American Indian peoples, Nkulukulu of the Zulu people, and the God of the Western World to keep us from destroying nature and its bounty, and thereby destroying ourselves. Simply stated, our direction in these troubled times can best be determined by following the old, biblical injunction: "I will lift up mine eye unto the hills from whence cometh my help." **IJW**

**DR. IAN PLAYER** is founder of the Wilderness Leadership School (South Africa), The WILD Foundation (USA), the World Wilderness Congress, and remains an active leader in the South African wilderness protection movement. Further information can be obtained from the International Center for Earth Concerns, 2162 Baldwin Road, Ojai, CA 93023, USA. This paper draws on Dr. Player's presentation at the 5th WWC (Norway, 1993) and can be found in *Arctic Wilderness: Proceedings of the 5th World Wilderness Congress,* 1995. V. Martin and N. Tyler, eds. Golden, Colo.: North American Press.

# The Biggest Threat to Wilderness

**BY G. JON ROUSH**



G. Jon Roush

THIRTY YEARS AGO, Congress passed the Wilderness Act in order to, "secure for American people of present and future generations the benefits of an enduring resource of wilderness." We in the United States are proud of our National Wilderness Preservation System, now over 100 million acres. The managers of our public lands have taken on the challenge of the wilderness stewardship. Wilderness research is emerging, and universities are offering more classes on various aspects of wilderness. Capping all this progress, the new *International Journal of Wilderness* will provide a timely forum for sharing new information and perspectives among diverse wilderness interests.

However, events are also unfolding that jeopardize wilderness. Threats to the wilderness system are ecological, economic, political, and social, but one overriding force will drive all the other threats. That force is population growth, and it could reverse most of our progress in wilderness protection. We can and must take steps to avert this tragedy. In this article, the threats driven by population growth are described, and what I think must be done to avert them.

To understand the threats, we need to understand what is at stake. When we protect wilderness, we are protecting more than land. We are protecting certain values that land embodies. The federal wilderness system is more than land. It is a complex set of relationships between people and the land. Through those relationships, we express what we value in wildland. A threat to wilderness threatens the relationship between people and the land, and the values inherent in those relationships.

*Threats to the wilderness system are ecological, economic, political, and social, but one overriding force will drive all the other threats. That force is population growth, and it could reverse most of our progress in wilderness protection.*

## WILDERNESS VALUES

What are the values that have led our nation to invest in wilderness? We have legally designated over one hundred million acres of public land as wilderness, more than half of it in Alaska. In the aggregate the system is as large as the state of California. On all that land (with only a few specific exceptions) we allow no roads, nothing motorized like trail bikes or chain saws, no logging or mining, no cabins, dams, or other structures. We have decreed that on this land, nothing mechanized will interfere with natural communities and natural processes. Why would we do that, and why are wilderness advocates calling for even more land to be added to the system?

People have proposed many reasons for saving wilderness, from which four basic arguments emerge. The first is the value of diversity. Wilderness is essential for the preservation of biological diversity and rare and endangered species. The most common reason for loss of diversity is loss of habitat. The complexity of wildland ecosystems makes it impossible to predict all the consequences of manipulating, fragmenting, or diminishing habitat critical for biological diversity. Therefore, the prudent approach is to leave the land alone as much as possible.

The second argument for protecting wilderness is its immediate usefulness. Wilderness provides unique and essential products or services essential for human well-being. Wild lands are essential parts of larger systems. For example, because wilderness stores and purifies water, the land is an essential part of many of our largest municipal water systems and rural irrigation systems.

The third argument recognizes the spiritual values of wilderness and its unique healing qualities. Wild land improves the quality of human life. Our species has spent virtually all its existence in diverse natural habitats, from our earliest beginnings in African forests and savannahs. No wonder even the most ardent lovers of cities want parks with green trees and grass and flowing water. No wonder we turn on cable TV shows about wild nature and watch with a primal fascination and longing. The values of wilderness for healing and personal growth are well documented. (See the articles on Wilderness Vision Fasting and Outward Bound in this issue.)

The fourth argument is the value of ethical behavior demonstrated through wilderness stewardship. This argument was developed elegantly by Aldo Leopold, in his essay "The Land Ethic."[1] He argued that we have an ethical responsibility to the land, by which he meant not just soil and water but the living community of species that inhabits the land. In the land ethic, a human being becomes not conqueror but plain fellow citizen of the land community. An ethical citizen, Leopold argued, treats other members of the land community with humility and respect. So the land ethic acknowledges that all species have a right to exist and, at least in some places, to exist in their natural state.

These four values are fundamental motives that lead us to protect wilderness: diversity, utility, quality of life, and responsible ethics. Population growth is a direct threat to these values and to wildland itself. Consider the following statistics and ask yourself whether these values are not in jeopardy.

## POPULATION GROWTH

The global population is expanding at a rate approaching one billion people per decade. Let's put that number, one billion people, in perspective. After millions of years of human history on Earth, the population of the whole planet finally reached one billion people around the year 1850. In the next 80 years, by 1930, we added another billion. We needed only 45 years to double again, adding two billion by 1975. In only 45 years from then, 2020, we will have doubled once again, adding not one billion, not two billion, but four billion people. Some people alive in 2020 will have seen the world's population increase by an astounding 300% during their lifetimes. As the United States struggles to manage its own exploding population, it also will face new problems responding to global demands for our resources.

People who downplay the threats of population growth offer several arguments. Some still say that new, unspecified technologies will save us. Others say that human labor is the source of wealth and innovation, and so the more human beings we have, the more wealth and creativity we will enjoy.

The days for such wishful thinking are over. We have increasing evidence that we already are approaching, or have surpassed, earth's carrying capacity. Neither technological ingenuity nor human productivity can overcome the fact that the Earths resources are finite. The limits are most evident in our food supplies.[2] For example, in the past we have counted on increasing the production of two sources of protein: fish and grain. In the past few years, the per capita production of both world s fisheries and world cereal supplies has leveled off, and may have begun to decline. In the 1970s, the United Nations Food and Agriculture Organization (FAO) estimated that ocean fisheries could not sustain a yield over 100 million tons per year. In 1989, the total fish catch, including fish farms and inland water ways, reached that number, and it has fluctuated between 97 and 99 million tons in the

four years since then. Since the world's population keeps growing, the fish catch per person actually declined 8% in those four years. Recent FAO reports indicate no excess capacity in any of the world's seventeen oceanic fisheries.

## DIMINISHED CAPACITY FOR FOOD PRODUCTION

The law of supply and demand works. The growing scarcity of seafood has caused an increase in cost. In 1960, a pound of seafood cost about half as much as a pound of beef. Now that difference has virtually disappeared. During the last ten years alone, the world price of seafood, in real terms, has risen almost 4% per year. That could be good news for beef producers, but it is bad news for the hundreds of millions of people who rely on fish as a staple in their diet.

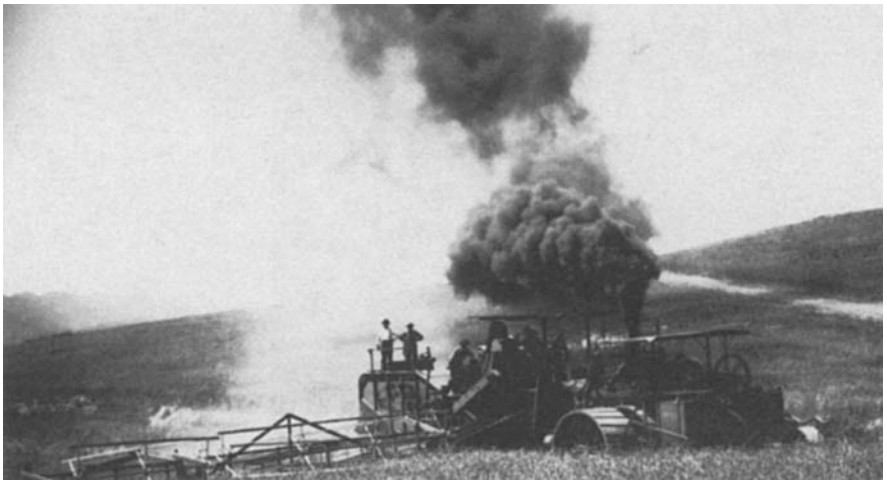
The prospects are no better for grain. In the past, we have gained productivity by using chemical fertilizers, irrigation, and new genetic varieties of crops. It seems we now have reached the point at which the marginal gains from using more fertilizer do not justify the costs. Although fertilizer use increased steadily from 1950 to 1989, global fertilizer use has been declining since 1989. In the United States use peaked early in the 1980s and has declined about 10% in the past decade.

Increased irrigation does not offer much promise; most of the world's best irrigable land is already in production. More importantly, our supply of irrigation water is decreasing. The most important world food crop is rice, but rice production requires huge amounts of water. We have depleted aquifers by overpumping, and rice yields per acre are falling. It is too early to tell definitely, but total global rice production may have leveled off for good in 1993. Farmers are switching to other grains that are less water dependent but also are less productive and less nutritious. Meanwhile, the world's population grows at an ever increasing rate.

The United States is not immune to these problems. We are drawing down our aquifers at a rate 25% faster than they are recharging. Some, like the Ogallala aquifer are depleting much faster. Meanwhile, every year our spreading population converts about one million acres of U.S. farmland to urbanization and roads.

Human beings already use an enormous portion of the net energy created by the world's photosynthesis—no less than 40%. And our demand continues to grow. By the year 2050, we can expect Earth s population to exceed 10 billion. I know of no ecologist who believes we can support that many people at our current standard of living.

But is that the right standard to use? Should we expect that we, let alone the whole world, should continue to enjoy our current standard of living? Another, perhaps more enlightened, reason offered for ignoring population growth is the idea that we really have a consumption problem, not a population problem. The United States, this argument goes, consumes much more than its share of the world's resources. If the United States, Japan, and Western Europe lived more rationally, spending less money on luxury items, eating less meat and processed foods, more resources would be available for a growing population. We could still enjoy a high-quality life while consuming less. The argument has merit. Surely, we could reduce our consumption and stretch the world's resources. Still, in the long run, that would only lessen the pain and slightly postpone the day of reckoning. The problem finally is numbers. The number of people is increasing, while the number of resources is decreasing.



*Agriculture changed forever the great central valley of California in order to feed land hungry settlers from the east during the early settlement period of the American West and the million that have followed since then.*

## THE FALLACY OF REDUCING CONSUMPTION

A reduction of consumption rates in the United States is not a strategy; it is an inevitability. We cannot sustain our current rates of consumption even if we wanted to. The questions are, how much will we reduce, and how fast, and how will we decide?

If everyone in the United States consumed no more than the average citizen of China, the strain on our resources certainly would be reduced. In China, on the average, 322 people occupy every square mile, while in the United States the average is only 69 people per square mile. If we followed the Chinese example, we would have room for 1.2 billion people, a 467% increase over our present population. But do we want to strive for the Chinese quality of life? We could learn many things from that ancient nation, but the art of cramming people into small spaces—at the expense of a low standard of living, ecological devastation, and political repression—is probably not something we want to emulate. On the other hand, maybe we should study China. At our present rate of population growth, the United States will reach China's current population of one billion by the year 2100. That is not so far away. Some of you readers will have children alive then.

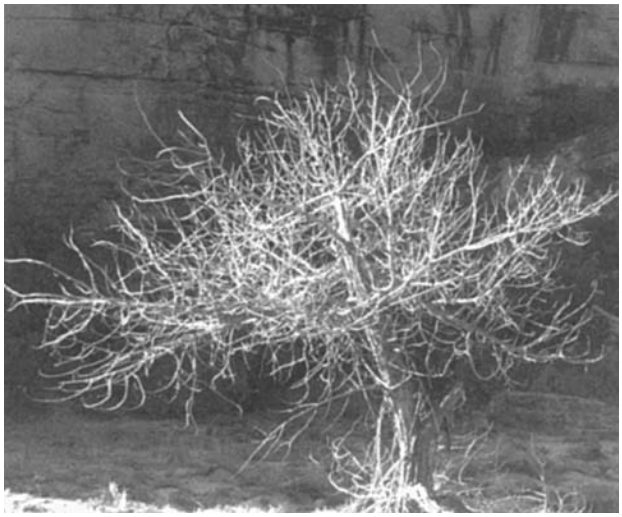
Still, it is argued, can't we learn to consume more wisely, so that we stretch our resources? Can't we eat more grains, and less processed food and meat, reduce our caloric intake, and become healthier while we are saving the planet? Certainly, in the United States, we do not need to spend $50 billion each year on tobacco; we could use the farmland now devoted to tobacco to grow food. Yes, we could and should, but still, the arithmetic is inescapable. If everyone in the world followed the prescriptions in the book *Diet for a Small Planet,*[3] we would stretch our food resources by ten years. At the end of that ten years, our per capita food supplies would still be declining. Furthermore, having already gained the efficiencies of improved consumption, we would have one less option to turn to.

We have increasing evidence that we already are approaching or have surpassed Earth's carrying capacity. Neither technological ingenuity nor human productivity can overcome the fact that Earth's resources are finite.

I could say much more about population, but this paper is about wilderness. The point I want to underscore is that, short of worldwide disease or war or unprecedented natural catastrophe, we cannot escape the numbers, at least not for the next two or three generations.

## IMPLICATIONS FOR AMERICAN WILDERNESS

For American wilderness, the problems posed by population growth are ecological, political, economic, social, and technological. Ecologically, more people will mean a greater demand for wilderness resources and a greater strain on the



*Population growth and the industrial-commercial-residential and transportation activity that follows it, creates indirect impacts on a global scale. Here a desiccated tree, weakened perhaps from the indirect environmental influences of civilization, stands alone in Arch canyon in southern Utah.*

ecosystems surrounding them. Since the National Wilderness Protection System was established in 1964, recreational use of federal wilderness areas has been growing at a rate even faster than our rate of population growth. Wilderness managers already worry about the growing human impact on popular areas. Increasingly, people are moving nearer to natural amenities and away from urban problems (which are, in part, caused by population growth). As this trend continues, so will the increase in demand for wilderness. Meanwhile, the land surrounding wilderness will be impacted as well, with more opportunities for soil erosion, air and water pollution, and other ambient problems that can degrade wilderness.

Fifteen years ago, the National Park Service reported to Congress that scenic resources were threatened significantly in more than 60% of the parks, air quality was endangered in more than 45% of the parks, and mammal, plant, and fresh water resources were threatened in more than 40% of the parks. More than 50% of the reported threats were attributed to sources outside the parks, including real estate development, air pollution, urban encroachment, and roads and railroads.[4]

Since that report was issued, both the ambient pressures and park visitation have increased dramatically, even more rapidly than our rate of population growth. Since 1940, U.S. population has doubled, but park visitation has increased 16 times. In Yosemite National Park, annual visitation has exploded from 820,000 in the 1950s to more than 3.5 million. Yosemite has been designated an International Biosphere Reserve and a World Heritage site, but population pressure will threaten its values for those purposes.

Our national forests also are experiencing population growth, and they sustain nearly three times as many visits as national parks each year (730 million in 1993). Yet visitation is not the only problem. The growing scarcity of resources will increase pressures for resource extraction, like mining, grazing, and logging. Wilderness values will be hard pressed to compete with economic demands. Natural areas and seminatural areas that now buffer wilderness areas from human incursion and provide similar values for short trips, will themselves become populated and degraded, thus complicating the work of wilderness managers. We already have suburban subdivisions lapping up against wilderness areas. People escaping urban pressures to live in log homes in the forest at the end of dirt roads expect the same services they enjoyed back in the suburbs. Their demands for road improvements, forest fire suppression, and logging to remove fire fuels will be listened to. This is a democracy.

Socially, population growth will pose deep and disturbing challenges to our culture. The traditions and values that have created and sustained our unique wilderness system will be challenged. This is the most important threat of all. Population growth will bring unpredictable cultural changes, including changes in the way we treat wilderness.

## WILDERNESS IN AMERICA'S EVOLVING CULTURE

In the early years of our nation, public land was an undifferentiated expanse of "wilderness"—that is, land that was not yet civilized. Our 18th century predecessors accepted the European idea that land had value only if it increased human wealth. Wilderness per se had no definable value. The words "cultivate" and "culture" both come from the same word, the Latin word for "plow." Europeans assumed that the way to bring land into the culture was to plow it—or log, graze, mine, or otherwise convert it to some immediate use. Public land was simply land that had not yet been appropriated for private purposes.

Gradually, through the 19th and 20th centuries, Americans assigned specific economic values to specific public lands. Some public land was valued for economic exploitation, when people recognized society would be better served to have the resources available to all rather than a few. Other public lands (a growing group) reflect different kinds of public values, that do not depend on exploitation. At first, it was most commonly watershed protection. Now we recognize that is only one of many ecological values that public land can serve.

Shifts in perception have been difficult to predict. They grew organically, like a river, from meandering streams of philosophy, politics, religion, technology, geography, and ecology. Predicting cultural change is difficult and risky. Still, we should ask, what will characterize American culture in the midst of population explosion and resource exhaustion? How will people perceive, and therefore treat, wilderness?

We have some signals from history that indicate that if land use is not sustainable, neither will our economy be sustainable, nor in the long run, will our society. History has many examples. Consider, for example, the fate of Mesopotamian and Mayan civilizations. Whatever else went wrong, those great cultures simply exhausted their resources and declined. But sadly, we do not have to look to ancient civilizations. In too many countries today, scarcity, caused largely by population growth, has weakened traditional customs and institutions. In Somalia, Rwanda, Kenya, and Uganda, families and communities necessarily organize to meet short-term needs. In some developing countries, families are using children for labor more than they have before in recorded history. As resources grow scarcer, and as water and firewood recede farther from home, families simply need more hands and feet. In parts of India now, some 10-year-old children work more hours than adult males do, tending livestock, fetching water and firewood, and watching younger siblings.[5]

I am not suggesting that the United States will soon decline to the level of Somalia, nor that a technologically developed society will have the same history as a developing, rural society. I am suggesting that these extreme examples show the inevitable social disintegration that accompanies extreme scarcity. Our wilderness system depends above all else on people's willingness to take the long view, to act responsibly toward future generations, and to give up some personal gain for the common good. The danger is that under the duress of population pressures, our culture will unlearn the progress of the past hundred years. Then the perception of wilderness as a heritage to be preserved will fade away, as once again we view the land chiefly as a resource to be used.

Now, recall the four arguments for wilderness. You can see how population growth in the United States threatens wildland and all its values. From no other cause than the sheer number of us, we may lose habitat and the biological diversity that wildland holds .We may overtax wildland's capacity to store water or purify water and air. We may degrade the spiritual and psychological experience of wilderness. And we

may lose the cultural ethic that has sustained a national wilderness system unprecedented in history.

## WHAT CAN WE DO?

If population growth threatens wilderness, what can we do? Citizens and policy makers alike need to think and work in three arenas. First, we must build informed, diverse constituencies for wilderness. Second, we must confront population issues directly and openly. Third, we must reform federal land management for ecosystem protection.

### 1. Build Constituencies for Wilderness

To build an informed, diverse constituency for wilderness, we need to educate people explicitly about wilderness. Through formal education from the earliest years, we should expect our citizens to have at least a rudimentary understanding of ecosystem values and concepts. Those concepts are central to understanding how this world works, and are central to any citizen actions that might avert the coming disaster. Informally, we also need to give people contact with nature. We need more urban parks with more natural features and less pavement; we need greenways connecting downtowns to natural areas; we need clean urban rivers.

We also need to build a constituency directly, through political and social action. We need ecological and economic modeling at the level of large ecosystems or bioregions. We need community organizers and forums in which people of all interests can come together to work on problems. Included in those regional forums should be public land managers who represent the legitimate interest of those outside the region, and those not yet born. We need people who have experienced wilderness and who treasure natural values in their lives.

### 2. Confront U.S. Population Growth Directly

To work on population problems directly, we need to begin with some very heavy lifting—lifting our heads out of the sand. We should acknowledge the problem and begin talking about solutions. Even if we are not immediately concerned about what happens elsewhere in the world, our concern for wilderness should move us to immediate action. Through schools, universities, and local, state, and national government, we should take action to slow the growth of population. At each level, cultural norms will shape what we do. We cannot pretend that problems do not exist—problems of reproductive health, contraception, adolescent pregnancy, overconsumption promoted by subsidies and other public policies, and immigration. These are difficult and often sensitive problems. I do not have the answers, but as someone who cares about wilderness, I know that we need to address them. They will not go away, and the sooner we address them, the less stressful the solutions will be. We cannot ignore, nor fail to engage, the religious and ideological institutions in our society for whom population control is taboo.

### 3. Reform Public Land Management

Now let us turn to public land policy. To prepare for the population onslaught, we primarily need productive, resilient, and diverse ecosystems. Federal policy should focus on maintaining the integrity of our remaining natural lands, especially those areas important for biological diversity. The first step is to complete the federal wilderness system, while we still have the opportunity. The Wilderness Society estimates that federal lands include about an additional hundred million acres of roadless areas that qualify for wilderness designation. The largest portion of these lands is in Alaska, but the lower forty-eight states also have tens of millions of acres. Much of the land is administered by the U.S. Bureau of Land Management, including crucial lands in Idaho, Utah, and New Mexico. Still, lands managed by all the federal agencies include large areas of important undesignated wilderness.

*Our wilderness system above all else depends on people's willingness to take the long view, to act responsibly toward future generations, and to give up some personal gain for the common good.*

In the present political climate, designating new wilderness areas will be difficult, although The Wilderness Society intends to take action as opportunities present themselves. Meanwhile, we have another important opportunity. Some significant wildlands already have been authorized but not added to the wilderness system. These are private inholdings within federal lands whose acquisition has been authorized, but for which money has not been appropriated. The Land and Water Conservation Fund (LWCF) is the chief source of money for these acquisitions. The main source of the LWCF is royalty income from off-shore oil drilling. The original justification for the fund was that resource depletion should pay for resource conservation. In many cases, the most cost-effective way to manage wilderness is to buy these inholdings rather than manage around them, but recent administrations and congresses have not seen it that way. About a billion dollars worth of authorized acquisitions is waiting for money to be released from the LWCF.

Of course, wilderness designation and land acquisition are only the first steps. We need to enhance wilderness management, and conduct research to support that management, to unveil wilderness' scientific treasures. If the new science of ecosystem management has any laboratory, it is wilderness, for only in wilderness are ecological relationships still largely intact. We can find no better models as benchmarks against which to compare ecosystem management on multiple-use lands.

Public land managers should give priority to ecosystem integrity, for all the reasons discussed, and for one other reason. Setting priorities would be an essential step toward coordinating the actions of different agencies, so that we can begin to manage whole ecosystems rather than arbitrary parts. We need to change our thinking about our public land. When Lewis and Clark explored the west, they were intent on finding what was here to exploit. That attitude opened the great public land states of the American West to settlement. In those days, our economic goals drove our behavior on the land. Now we must reverse that priority. Ecological goals must now drive our economy and all other aspects of public policy. The reason is not that the economy is unimportant. The contrary is true. If you care about our economic future, then you should understand that without sustainable ecosystems, we cannot have sustainable economies.

To summarize, if you care about wilderness, you must be concerned about population growth. If you worry about population growth, you must see the need to protect wilderness. Healthy ecosystems, with wildlands at their core, are essential elements of a population strategy Without them, we cannot withstand the ecological, economic, social, and political impacts of the coming population avalanche. **IJW**

**G. JON ROUSH** was appointed president of The Wilderness Society in January 1994. After receiving his Ph.D. in English from the University of Califronia at Berkeley, he was an Assistant Professor of Literature and Humanities at Reed College and a Program Officer at the Carnegie Corporation of New York. He also worked for The Nature Conservancy, first in the western United States and then as executive vice president. For further information, contact The Wilderness Society, 900 17th Street N.W, Washington, D.C. 20006, USA; (202)429-2677.

## REFERENCES

[1] Leopold, Aldo. 1949. *A Sand County Almanac, reprint* 1982. New York: Oxford University Press.

[2] The statistics for global scarcity in the following seven paragraphs are from *State of the World*. 1995, p. 5–10.

[3] Lappe, Frances Moore. 1982. *Diet for a Small Planet*. New York: Ballantine Books.

[4] National Park Service, *State of the Parks Publisher,* 1980,

[5] Partha S. Dasgupta, "Population, Poverty and the Local Environment," *Scientific American* (Feb. 1995), 43.

# The Changing Role of Wilderness in Ecosystem Management

BY MARK W. BRUNSON

**Abstract:** *Wilderness has played only a minor role in peer reviewed discussions of how ecosystem management will be implemented on federal lands, even though ecosystem management will affect all lands including wilderness. This article examines relationships between the philosophies of ecosystem management and wilderness management including how wilderness managers can help in developing ecosystem management strategies. Three examples are provided on how wilderness objectives might shift under ecosystem management.*

*While we may be able to predict which species are most likely to be eliminated from a community due to recreation and commodity uses, we may not know what that loss means to the species that remain.*

PUBLIC LAND AGENCIES IN NORTH AMERICA have begun shifting toward an ecosystem management approach to land management. This shift in philosophy reflects concerns about the often severe impacts of human activities on natural systems. While discussions of ecosystem management dominate the current discourse about natural resources, the word "wilderness" rarely is mentioned in those discussions. Yet ecosystem management is a shift in both the practice and the philosophy of natural resource management, and so will affect all lands including wilderness. This paper examines connections between wilderness management and ecosystem management, then explores three examples of how wilderness management issues may take on new meaning in the ecosystem management era.

Ecosystem management is an approach to managing lands and resources that integrates ecological, sociopolitical, and economic principles so as to safeguard the sustained, long-term maintenance of human and ecological communities. Definitions of ecosystem management nearly always refer to three critical aspects: ecological sustainability, directing the land toward desired conditions that embody the complexity of ecological relationships at multiple spatial and temporal scales; social acceptability, showing increased sensitivity to amenity values while supplying the wide range of products and services that the public demands; and adaptive management, employing extensive monitoring and holistic problem-solving that allows rapid response to changing conditions. As this definition suggests, a challenge for ecosystem managers will be to balance the social and ecological dimensions of their task. This is a challenge that wilderness managers know well.

One important reason why wilderness does not play a prominent role in discussions of ecosystem management may be that managers' attention has necessarily been drawn to lands where commodities are produced, since that is where ecological sustainability has been most threatened. A second reason might be found in Title 16 of the Wilderness Act:

> A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.

The law describes wilderness as nature's place, managed as nonmanipulatively as possible, where the human element is kept largely subordinate to natural influences. It is not subject to the kinds of manipulations (e.g., using selection methods for timber harvest) that many people associate with ecosystem management.

Yet the Wilderness Act also describes wilderness as a "resource" that must be protected for "the use and enjoyment of the American people." This paradox at the core of wilderness management—that humans benefit from wilderness but that wilderness exists apart from humans—can also be found underlying the concepts of ecosystem management. For example, in a recent statement of philosophy adopted by the U.S. Forest Service's Southwestern Region (USDA Forest Service 1994), the authors assert that "humans are an integral part of today's ecosystems and depend on ecosystems for survival and welfare." However, they also note that "as people become more urbanized, they often become more physically and mentally separated from the nonurban ecosystem on which they depend."

One study of ecosystem management (Evenden et al. 1993) noted that many of the values that people hold for public lands are afforded especially well by wilderness settings. These include social values such as solitude, psychological renewal, spiritual reawakening, challenging recreational opportunities, and the close study of nature. In addition, there are the ecological values such as scientific controls and replicates, reservoirs of biodiversity, preserved ecological processes, development of an ecological ethic, and bequests of undisturbed natural beauty to future generations and its intrinsic value. Wilderness therefore has a role in ecosystem management that is critical for maintaining the biophysical system but also the socioeconomic context within which it functions. Neither role can be safely ignored.

## ECOSYSTEM MANAGEMENT MUST INCLUDE PEOPLE

Few land managers would dispute Salwasser's (1994) statement that "ecosystem management is more about people than anything else." Yet ecosystem managers have so far seemed to focus more intently on the biophysical dimension. For example, many U.S. Forest Service (USFS) personnel, discomfited by the flexibility of the ecosystem management concept, praised

**(Peer Reviewed)**

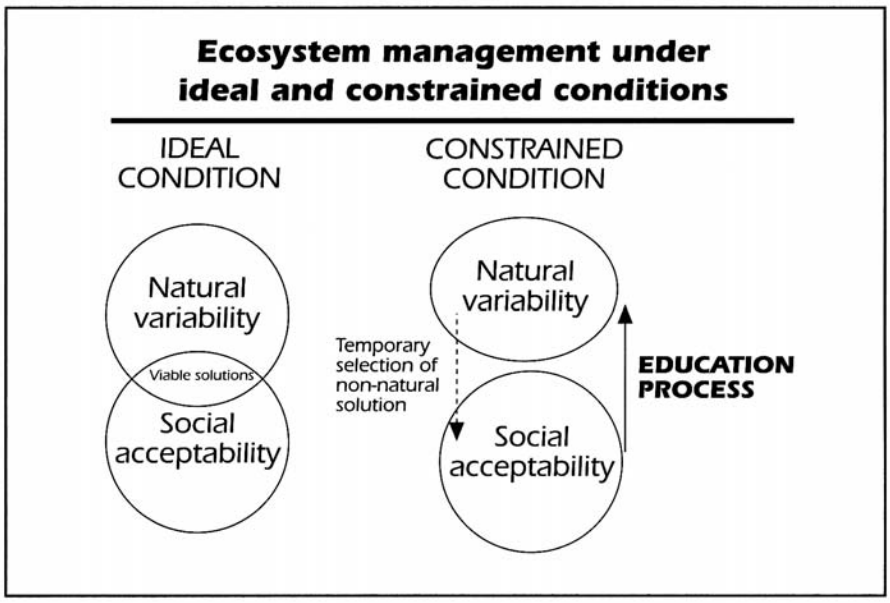



*Figure 1. Ecosystem management decisions should consider both the historic range of natural variability and the range of social acceptability. Under ideal conditions the two ranges will overlap, yielding one or more viable solutions to the problem under study.*

this definition of ecosystem management which flashed across the agency's computer system in 1993:

> ... the human element of altering, by careful manipulation, the communities of all living organisms and all of the physical and biological factors that together make up their environment, within a previously specified boundary, which has as its goal a long-term sustainable balance that provides for the benefit of all recently historical species (1800 AD) and environmental factors that influence those species, with preference given to none.

The definition was praised for its terminological precision and focus on quantifiable objectives. Yet it ignored the social aspect of ecosystem management after its first three words. Similarly, a literature review by Grumbine (1994) found ten key ecosystem management concepts, only two of which directly related to the human dimension.

The imbalance between biophysical and social dimensions is reflected in the way ecosystem management is incorporated into agency organizational structures. The staff person in charge almost invariably comes from a natural science profession such as silviculture, range science, or wildlife biology. Rarely do they have backgrounds in recreation, landscape architecture, or sociology. This person's first task generally is to identify the range of natural variability (i.e., changes in the ecological condition of the area since the arrival of European—American settlers began to alter forest systems). Two assumptions underlie this approach to ecosystem management: 1) alterations by native peoples, if they occurred at all, were adaptations to natural processes while post-settlement change occurs independent of such processes; 2) pre-settlement conditions were always ecologically sustainable.

Certainly there is ample evidence that deviations from the range of natural variability often have not been sustainable. Yet even if sustainability of natural systems is given primacy in ecosystem management decisions, it is essential that those decisions be able to withstand political assaults from those who oppose a change in policy. The November 1994 elections offer compelling evidence that those who oppose biocentric approaches to land management still wield political power. To maintain political defensibility, a *range of social acceptability* needs to be defined at the same time as the range of natural variability is determined. Under ideal conditions, these independently derived social and natural ranges will overlap, creating a range of potential solutions (see Figure l). When no such overlap exists—as surely will happen sometimes—managers will have to decide whether to try to use public education to shift the range of social acceptability in the direction of natural variability, or to operate, at least temporarily, outside the range of natural variability.

## WILDERNESS MANAGEMENT CONTRIBUTIONS TO ECOSYSTEM MANAGEMENT

This is precisely the dilemma wilderness managers have confronted for 30 years. The Limits of Acceptable Change (LAC) approach to wilderness management planning (Stankey et al. 1985) can be considered an attempt to define where the overlap between sustainability and acceptability exists, or, if that is not feasible, as a way to ensure that human activities don't stray further than absolutely necessary outside the range of natural variability. "Leave No Trace" education programs (e.g., Cole and Hampton 1988) can be characterized as efforts to shift the range of social acceptability in the direction of natural variability. Wilderness managers' expertise in LAC and "Leave no trace" education techniques could prove invaluable to ecosystem managers.

Another contribution wilderness managers can make is by sharing their experiences with the transactive planning approach advocated for use in LAC processes (Stokes 1990). Ecosystem management requires means of incorporating public needs and concerns into agency decision-making which transcend the limitations of the National Environmental Policy Act (NEPA) process. Collaborative planning is seen as a way to give interest groups "ownership" in ecosystem management decisions, especially when those decisions will address issues that cross agency boundaries. When seeking a model of sound collaborative planning, we need look no further than the LAC process as applied in the Bob Marshall Wilderness complex (Stokes 1990). Participants in the Bob Marshall LAC task force gained shared understandings and a mutual commitment to the process despite their divergent interests, and they developed a product that has so far received high levels of support both in the community and agency (Moore 1994). Wilderness managers who have used transactive approaches successfully should be able to help ecosystem management staffs design collaborative processes that could address non-wilderness issues.

## NEW CHALLENGES FOR WILDERNESS MANAGERS

The use/preservation balance in wilderness has gradually shifted since 1964 in the direction of ecosystem protection. Still, human uses—especially recreation, livestock forage, drinking water, and other products—remain a primary consideration. If ecosystem management means a shift in the overall orientation of agencies toward protecting natural systems, the trend may be accelerated in wilderness management. There may be less willingness within agencies or on the part of wilderness activists to favor solutions that lean in the direction of social values.

Already this trend can be seen in the activities of some environmental groups. Proponents of the Wildlands Project advocate using wilderness areas as core reserves in conservation biology efforts, and envision further restrictions of human activities in some of those reserves (Foreman et al. 1992). One Utah wilderness group has shifted its advocacy focus from designation of new wilderness areas to protection of existing ones and calls for controversial actions such as a partial ban on hunting and game fish stocking (Carter 1994).

Meanwhile, new ecological knowledge may focus attention on concerns that hadn't arisen before. Ecosystem management itself is primarily a response to emerging knowledge about how wildland commodity uses affect habitats at various spatial and temporal scales (Salwasser 1994). Its emphasis on monitoring and. adaptive management is likely to increase the influence of scientific knowledge on management decisions. As researchers uncover new causes for concern about anthropogenic impacts, the tendency to "err on the side of the ecosystem" in wilderness regulation may become more pronounced. The following three examples illustrate how decision criteria in wilderness management might change.

**1. Recreational Packstock**

Packstock are commonly used in about half of all wilderness areas (McClaran and Cole 1993), though such use has declined as the wilderness user population grows more urban, and supplies and equipment become more portable. The impact of horses, mules, and burros on alpine and desert ecosystems have been concerns for outdoor recreation managers for at least half a century (Sumner 1942). A recent comprehensive study found widespread evidence of trampling along stream banks and in camps, severe defoliation in heavily grazed areas, and animal wastes around camps, streams, and lakes (McClaran and Cole 1993).

*Wilderness managers' expertise in Limits of Acceptable Change and Leave No Trace education techniques could prove invaluable to ecosystem managers.*

The 1980s saw a significant increase in the use of llamas—and to a lesser extent, goats—as packstock. Llamas are reputed to be easier to handle than equine packstock, and are said to have fewer biophysical impacts than horses. Llamas and goats eat less and produce smaller droppings than equine pack animals, and, because of their smaller foot and body size, seem unlikely to cause the same levels of soil erosion or stream bank degradation. Yet some wilderness managers have expressed concern that llamas and goats might transmit diseases to wildlife, or escape and create feral backcountry populations. For those reasons, and because of safety concerns about horses shying or bolting when meeting llamas on the trail, some wilderness managers have banned llamas and goats (McClaran and Cole 1993).

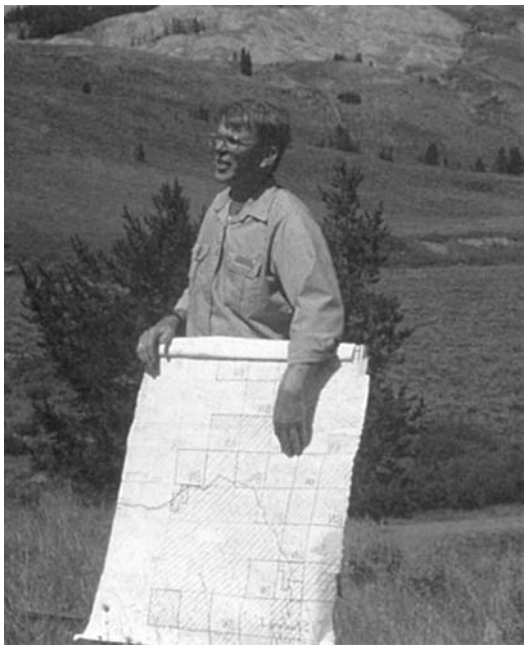
Moving to a more ecologically driven form of wilderness management might shift the balance of hikers, equine packstock and non-equine stock. Horses are a traditional part of wilderness use, and indeed were the basis for Leopold's (1921) original definition of wilderness as a place large enough for a two-week pack trip. Some large western wilderness areas have had nearly as many users with packstock as without. Moreover many managers—especially those who have served longer—have symbolic attachments to packstock rooted in "pioneer values and frontier aesthetics" (Moore and McClaran 1991). Thus, for symbolic and practical reasons, use of horses, mules, and burros has been tolerated even by managers who ban llama or goat use.

Packstock of any kind can cause local defoliation, increase camp and trail damage, degrade water quality, and introduce exotic weed seeds. However, equine packstock may do more damage than llamas or goats. Already many areas have adopted regulations requiring the use of certified weed seed-free feed— a rule which may disproportionately limit horse and mule packers because their animals require greater amounts of certified hay. Moreover, wilderness hikers are more likely to dislike meeting parties riding or leading horses than parties with llamas (Watson et al. 1993). Moore and McClaran (1991) suggest that as leadership roles begin to be filled by younger managers with less romantic attitudes toward packstock, a more pragmatic approach to packstock management may take hold. The trend already seems to be to resolve use conflicts to the detriment of traditional packstock users. Ecosystem management is only likely to enhance such a trend.

However, because llamas are not indigenous to the United States, the tendency to ban them also could increase. Potential negative impacts such as disease transmission are not easily confirmed. Concern about "exotic" species is increasing in wilderness management as well as conservation biology, and it may be deemed wisest to presume guilt until proven otherwise. Moreover, since llamas still account for only about 5% of all packstock use (McClaran and Cole 1993), rules against llama use can be enacted with lower political cost.

**2. Exotic Weed Control**

A wide variety of nonnative plants and animals inhabit wilderness areas. Most, if not all, have had negative impacts on ecosystems, from fungi such as white pine blister rust, which is decimating whitebark pine populations (Hoff and Hagle 1990), to the introduced trout, which are changing the structure of aquatic invertebrate populations in high mountain lakes (Luecke 1990). One of the most pervasive and difficult problems is that of exotic plants. One such plant, spotted knapweed *(Centaurea maculosd)* has colonized thousands of acres inside the Selway-Bitterroot Wilderness (Kummerow 1992). A 1991 study put the total knapweed acreage in the Bob Marshall Wilderness at a comparatively meager 250 acres, but found 108 different infestation sites (Winfield and Monnig 1993). These invaders are often able to successfully outcompete native species—so much so that there are meadows in Glacier National Park where 85% of the total plant biomass consists of spotted knapweed (Winfield and Monnig 1993). Since ecosystem management has as one of its principal objectives the maintenance and restoration of natural plant communities, the need to prevent and control exotic weed introductions is considerable.



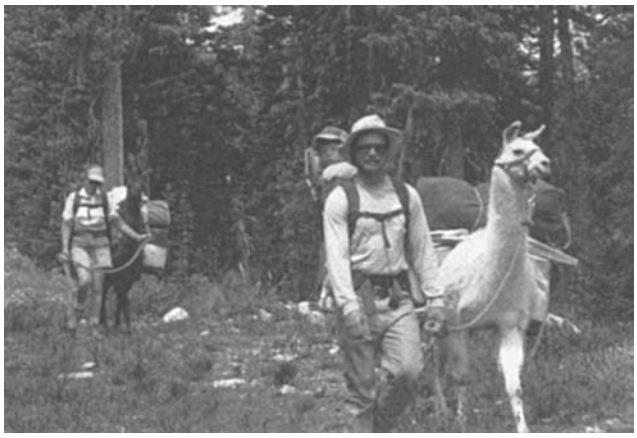
*Engaging natural resource users and the full spectrum of stakeholders in dialogue about use and management will be a key challenge for ecosystem management.*

Strategies to prevent the spread of weeds in wilderness so far have focused largely on eliminating weed seeds from packstock fodder. However, this can have only limited success because little can be done about the pastures in which packstock graze immediately prior to entering the wilderness, nor about seeds carried by wildlife. Recreation users without packstock also can spread weeds. For example, while roads don't enter wilderness, they are a critical step in the introduction process as the weeds spread along the disturbed edges of roads to wilderness trailheads and ultimately trails (Kummerow 1992).

Clearly prevention efforts must be supplemented by post-infestation control. Therein lies a potential conflict between ecosystem management and wilderness objectives. Control options fall into four categories, listed in descending order of compatibility with wilderness: manual (e.g., hand-pulling); biological (grazing by sheep or goats, importing natural pests); cultural (plowing and replanting, irrigation); and chemical spraying (Kummerow 1992). All are legal under the Wilderness Act, but visitors

may find chemical sprays contrary to the spirit of the Act, even if applied by hand. Horse-powered agriculture is only slightly less obtrusive, and grazing is frequently disparaged by recreationists. Unfortunately, the control options are also listed in ascending order of feasibility and effectiveness. The cost of manual control of knapweed in the Bob Marshall Wilderness has been estimated at $1.9 million, or $7,600/acre (Winfield and Monnig 1993), and the resulting disturbance might only create new seed beds for the next exotic invader. Biological and cultural treatments are only slightly more practical, leaving herbicides as the only reasonable way to control weeds in wilderness.

For recreationists who may not recognize flowers as exotic, the presence of weeds is probably less obtrusive than a ranger wielding a chemical spray canister. Recreation-oriented wilderness managers might opt for chemical control only under the direst circumstances. But under ecosystem management the ecological imperative to reduce weed populations could be stressed, and the negative impacts on recreation deemphasized. So far there has been little public opposition to spot application of chemicals in wilderness, but there is no guarantee that a more widespread program would escape political scrutiny.



*The popularity of llamas as packstock is increasing, partly because they have lighter ecological imacts on wilderness environments. Under ecosystem management this trend may accelerate, or it may be reversed if there is increased concern about the potential impacts of allowing non-native mammals in the wilderness. Photo credit: Doug Ouren.*

**3. Protecting Plant Communities**

Uses of wilderness such as recreation or livestock grazing affect plant communities in several ways. Species composition can change as disturbances (trampling, overgrazing, etc.) reduce the survival of rarer or more sensitive species while producing habitat for exotic plants or native disturbed-site colonizer species (Cole 1993; McClaran and Cole 1993). In the worst cases, there could be substantial reduction in within-community species diversity. Even if species composition does not change, individual plant fitness can be affected by trampling which affects plant morphology (Cole 1993).

Unfortunately, there is much we don't know about the effects of these anthropogenic disturbances on wilderness plant communities. Plant community ecology research in forested systems has tended to focus on economically important, tree-dominated systems. Much less has been done in the kinds of alpine or desert environments where wilderness areas tend to be located. Cole's extensive work on recreation impacts in wilderness has focused on short-term impacts and on structural variables such as cover, species composition and richness, plant height, and percent bare ground (e.g., Cole 1993, Cole and Marion 1988). Information about community function is much less available. As a result there are ecologically important questions we may not be able to begin to answer.

While we may be able to predict which species are most likely to be eliminated from a community due to recreation and commodity uses, we may not know what that loss means to the species that remain. Are important nitrogen-fixers more susceptible to these impacts than other species in an alpine plant community? Would local elimination of a particular species force herbivores to shift to another species that is less susceptible to recreation impacts but is locally or regionally rare? Do non-fatal impacts such as reduced height or foliage have relatively minor short-term effects but more serious long-term consequences (e.g., reduced reproductive fitness)? Can recreational gathering of products from wilderness plants affect localized survival by reducing seed sources or reproductive ability?

Already managers in the national parks of the Colorado Plateau are eyeing restrictions to protect cryptogamic soils, in which communities of bacteria, algae, fungi, lichens, and mosses bind soil particles together to produce irregular, crusted substrates important for plant germination and erosion control. These fragile desert soils are very susceptible to trampling by recreationists (Cole 1990), but visual evidence suggested that they also recover fairly rapidly. More recent research suggests that the physical recovery occurs much sooner than recovery of community structure (Belnap 1993), and it isn't known how rapidly the crust communities regain their vital roles in nitrogen fixation and water conservation.

It may be relatively easy to restrict off-trail use at cryptogamic crust sites in National Park Service settings, where heavy use has long made visitor controls mandatory. That may not be true in USFS, U.S. Bureau of Land Management, or U.S. Fish & Wildlife Service areas where the mandate for a "primitive and unconfined type of recreation" has encouraged wilderness managers to use unobtrusive persuasion as the sole means of discouraging damaging off-trail use. As we know, some wilderness visitors see branches laid across a shortcut trail as an attractant rather than a barrier. More obvious strategies may be required under ecosystem management.

## CONCLUSION

Reconciling ecological and social imperatives is a critical challenge of ecosystem management. This same challenge is one that wilderness managers have tackled for 30 years. Ecosystem managers can learn much from the wilderness management experience, and especially from the LAC process. While the management challenge in wilderness will not be a new one, managers' choices could change under ecosystem management as decisions lean increasingly in the direction of ecological concerns. Ironically, one of those changes may affect the application of the LAC process.

The fundamental assumption of LAC is that anthropogenic change is inevitable, but too much anthropogenic change is unacceptable. Human interest groups, through transactive or NEPA-style planning processes, define the thresholds beyond which change should not occur. The implication is that social acceptability has priority over ecosystem sustainability in wilderness planning and that ecological concerns are addressed mainly by the fact that wilderness interests generally prefer natural conditions in wilderness anyway. But that may not be good enough under ecosystem management. If ecological priorities are indeed to be placed above social ones in ecosystem management, managers may consider some standards nonnegotiable (e.g., trampling of plant communities) while only impacts of purely recreational concern will remain within the purview of collaborative planning. Lenient standards set by existing LAC plans may be ignored by wilderness managers who feel bound to be more restrictive. Some managers may decide to exclude human use altogether in highly sensitive settings. Such decisions will be difficult politically as well as administratively. The resulting disputes may provide a true test of ecosystem management as well as wilderness management.

This paper is based on research supported by the USDA Forest Service, Pacific Northwest Research Station, and the Utah Agricultural Experiment Station, Utah State University, Logan, UT 84322-4810, USA. (McIntire-Stennis Project No. UTA-700). Ideas expressed here grew out of discussions with George Stankey and Alan Watson. **IJW**

**MARK W. BRUNSON** is a faculty member in the Department of Forest Resources at Utah State University, Logan, UT 84322-5215, USA; (801) 797-2458.

REFERENCES

Belnap, J. 1993. Recovery rates of cryptobiotic crusts: in-oculant use and assessment methods. *Great Basin Naturalist* 53(l):89-95.

Carter, D. 1994. A Utah Wilderness Association wilderness vision. Utah Wilderness: The First Decade! *Utah Wilderness Association newsletter* (September): 1994, 3–4.

Cole, D. N. 1990. Trampling disturbance and recovery of cryptogamic soil crusts in Grand Canyon National Park. *Great Basin Naturalist* 50 (4): 321–324.

Cole, D. N. 1993. Trampling effects on mountain vegetation in Washington, Colorado, New Hampshire, and North Carolina. *USDA Forest Service Research Paper INT-464*. Ogden, Utah: Intermountain Research Station.

Cole, D. N., and B. Hampton. 1988. *Soft Paths.* Harrisburg, Pa.: Stackpole Books.

Cole, D. N., and J. L. Marion. 1988. Recreation impacts in some riparian forests of the eastern United States. *Environmental Management* 12 (1): 99–107.

Evenden, A., P. Landres, and A. E. Watson. 1993. The role of wilderness/natural areas in ecosystem management. Unpublished paper prepared for the Northern Region and Intermountain Research Station, USDA Forest Service.

Foreman, D. J. Davis, D. Johns, R. Noss, and M. Soule. 1992. The Wildlands Project mission statement. *Wild Earth* (special edition): 3–4.

Grumbine, M. E. 1994. What is ecosystem management? *Conservation Biology* 8(l): 27–38.

Hoff, R., and S. Hagle. 1990. Diseases of whitebark pine with special emphasis on the white pine blister rust. In *Proc.–symposium on whitebark pine ecosystems: ecology and management of a high-mountain resource.* Schmidt, W. C, & McDonald, K. J., eds., USDA Forest Service General Technical Report INT–270. Ogden, Utah: Intermountain Research Station.

Kummerow. M. 1992. Weeds in wilderness: a threat to biodiversity. *Western Wildlands* 18 (Summer): 12–17.

Leopold, A. 1921. The wilderness and its place in recreational policy. *Journal of Forestry* 19: 718–721.

Luecke, C. 1990. Changes in abundance and distribution of benthic macroinvertebrates after introduction of cutthroat trout into a previously fishless lake. *Transactions of the American Fisheries Society* 119:1010–1021.

McClaran, M. P., and D. N. Cole. 1993. Packstock in wilderness: use, impacts, monitoring, and management. USDA Forest Service General Technical Report INT–301. Ogden, Utah: Intermountain Research Station.

Moore, S. A. 1994. Interaction processes and the resolution of environmental disputes: case studies from public land planning in the United States and Australia. Ph.D. diss., University of Washington.

Moore, S. D., and M. P. McClaran. 1991. Symbolic dimensions of the packstock debate. *Leisure Sciences* 13: 221–237.

Salwasser, H. 1994. Ecosystem management: can it sustain diversity and productivity? *Journal of Forestry* 92 (8): 6–10.

Stankey, G. H., D. N. Cole, R. C. Lucas, M. E. Peterson, and S. S. Frissell. 1985. The Limits of Acceptable Change (LAC) system for wilderness planning. USDA Forest Service General Technical Report INT–176. Ogden, Utah: Intermountain Forest and Range Experiment Station.

Stokes, G. L. 1990. The evolution of wilderness management. *Journal of Forestry* 88 (10): 15–20.

Sumner, L. 1942. The biology of wilderness protection. *Sierra Club Bulletin* 27 (4): 14–22.

USDA Forest Service. 1994. The human dimension in sustainable ecosystem management: a management philosophy. Document prepared by the Human Dimensions Study Group, Southwestern Region and Rocky Mountain Forest and Range Experiment Station. Washington, D.C.: Government Printing Office.

U.S. House. 1964. The Wilderness Act. *See* Title 16, ºl 131 [c].

Watson, A. E., M. J. Niccolucci, and D. R. Williams. 1993. Hikers and recreational stock users: predicting and managing recreation conflicts in three wildernesses. USDA Forest Service Research Paper INT–468. Ogden, Utah: Intermountain Research Station.

Winfield, J. T, and E. Monnig. 1993. Noxious weeds in the Bob Marshall Wilderness complex. Paper presented at the annual meeting of the Society for Range Management, Feb. 14–19. Albuquerque, N.M.


# Fish Stocking—A Plea For Wildness

Fish stocking in many high elevation lakes of western North America may place highly effective alien predators into vulnerable prey communities and this can result in the decline or elimination of native aquatic species. Such events contradict the naturalness goals of the Wilderness Act. Thus, many scientists and conservationists are increasingly challenging fish stocking in wilderness on ecological and ethical grounds.

For example, field data collected in the Selway-Bitterroot Wilderness of Idaho and Montana (Bahls 1990) suggests that several aquatic species may be impacted by fish stocking, such as the long-toed salamander, which suffers from progressive population fragmentation and isolation. Fish stocking in wilderness will be a topic of increasing controversy in the future.


—Greg Gollberg and Michael P. Murray

Ecocentric Wildlands Management Institute, Moscow, Idaho



REFERENCES

Bahls, E, and M Stkkney. 1987. Preliminary report of the High Lake Fisheries Project, Moose Creek Ranger District, Idaho. *USDA For. Serv. publ. Nez Perce National Forest*. Grangeville, Idaho; U.S. Government Printing Office.

Bahls, P. 1990. Final report of the High Lake Fisheries Project, Nez Perce National Forest. *USDA Per. Serv. publ. Nez Perce National Forest*. Grangevilie, Idaho: US. Government Printing Office.

# Fish Stocking in U.S. Federal Wilderness Areas—

## *Challenges and Opportunities*

BY DONALD A. DUFF

**Abstract:** Fish stocking in wilderness has been a widespread and largely indiscriminate practice with synergistic impacts on wilderness naturalness and species biodiversity State and federal stocking activities recognize recreational fishing opportunities, but have given little consideration for maintenance of wilderness aquatic ecosystem value and integrity. Controversy has centered around state and federal responsibilities in stocking practices and wilderness management. Public concern for wilderness stewardship and the maintenance of ecosystem and species biodiversity is leading to increased interagency efforts to *reassess* stocking practices in wilderness.

FISH STOCKING IN DESIGNATED WILDERNESS is a controversial issue because of changing resource values. The stocking of nonindigenous fish to enhance recreational fishing can compromise an area's natural character and cause declines or elimination of some indigenous fish and aquatic organisms (Bahls 1992; Bradford et al. 1993; Hendee et al. 1990). Most fisheries managers agree that fish stocking has a major affect on wilderness and species diversity, especially in the western United States, and the continued maintenance of these stocked populations is being questioned under ecosystem management (Wiley and Hubert 1994).

Native fish and other aquatic organisms are ... important indicators of wilderness health. Managers are faced with the challenge to provide for wilderness character where natural processes operate freely and provide foe at the same time, a natural balance of interdependent indigenous species.

State fisheries managers estimate that, as a result of stocking, less than 1% of lakes with historic distribution of fish still contain relatively pure strains of indigenous fish (Bahls 1992). Although many refer to fishless lakes as barren, waters without fish typically support a diversity of species, such as amphibians, frogs, invertebrates, crustaceans, and insects. Declines in native aquatic fauna have been attributed to fish stocking in wilderness waters in several states (e.g., Washington's North Cascade Range, California's Sierra Nevada Range, and Utah's Wasatch and Uinta Ranges [Bahls 1992; Bradford et al. 1993; Hovingh 1994; Liss and Larson 1991; Murray 1994; and Reimers 1979]).

Past management of wilderness fisheries has emphasized maximizing the recreational aspects of fishing as opposed to the maintenance and protection of the natural biological character of wilderness ecosystems. This emphasis, through stocking programs, caused declines in or elimination of some fisheries and other aquatic organisms (Wiley and Hubert 1994). Federal wilderness managers are mandated to view wilderness as a resource that does not need to be subjected to human manipulation in order to extract its value. They recognize the states' responsibility in fisheries management, yet federal managers' concern for maintenance of wilderness character has led to state-federal jurisdictional conflicts in fish stocking policies and practices.

The Wilderness Act of 1964 mandates protection of wilderness so its community of life are untrammeled by humans and its natural conditions are preserved (P.L. 88-577 1964). Aldo Leopold alluded to the land as "one organism," with all its parts interconnected. He believed the first principle of conservation is "to preserve all the parts of the land mechanism" (Leopold 1966). Native fish and other aquatic organisms are important wilderness resources. They are important indicators of wilderness health (Schoenfeld and Hendee 1978; USDA FS 1990). Managers are faced with the challenge to provide for wilderness character where natural processes operate freely and provide for, at the same time, a natural balance of interdependent indigenous species.

Many states have expressed concern to the U.S. Forest Service (USFS) over management constraints imposed by wilderness. In 1986 the International Association of Fish and Wildlife Agencies (IAFWA) and the American Fisheries Society (AFS) met and developed wilderness fish guidelines jointly agreed to by the IAFWA, representing the states, USFS, and the U.S. Bureau of Land Management (USBLM). A recent USFS and USBLM directive reaffirms adherence to these guidelines and the responsibility of the state in wilderness fish stocking decisions (USDA FS 1995).

Following is a brief review of fish stocking activities that have affected wilderness values; the extent to which impacts of stocking on wilderness have been addressed; and the future challenges and opportunities for future wilderness fisheries management. The USFS will be used as a key agency example but other agencies are also discussed.

### MANAGEMENT POLICIES

Federal wilderness is managed by the U.S. Department of Agriculture, Forest Service (USDA FS), and US. Department of the Interior (USDI) agencies, namely, the National Park Service (NPS), the USBLM, and the Fish and Wildlife Service (FWS). Fish stocking is the responsibility of individual state wildlife agencies, except the FWS may stock fish on either state or federal lands, if requested by the agency.

**(Peer Reviewed)**

Fish stocking policy differs somewhat with each agency. USFS policy emphasizes naturalness in managing wilderness fisheries. Stocking of indigenous and native fish is allowed to reestablish or maintain indigenous species, or to recover a threatened, endangered, or sensitive species. Naturalized, or established species, may be stocked if their presence does not impair wilderness values. Exotics are prohibited. Fishless waters should not be stocked (USDA FS 1990, 1995). USBLM allows stocking of native and naturalized (established exotics) species where practice existed prior to wilderness designation, and to reestablish indigenous and threatened and endangered species. Fishless lakes will be considered on a watershed by watershed basis. Exotics species will not be introduced (USDI BLM 1992).

*Solitude for wilderness visitors is doubly disturbed by stocking. Aerial stocking is disturbing to any visitors in the vicinity and increased use of stocked areas by fishermen can further reduce solitude. ... the increased visitation can compromise a lake's remoteness, impair water quality from human and packstock waste and trampling, and reduce native vegetation in and adjacent to aquatic-riparian ecosystems.*

The NPS native animal management is empowered by the property clause of the U.S. Constitution and the NPS Organic Act (USDI NPS 1991), and upheld by court cases (USSC 1976). Where a park has concurrent or proprietary jurisdiction, state laws and regulations also apply to the fishery. However, NPS precedence of authority can implement more restrictive regulations to protect native fish. NPS policy allows fish stocking in wilderness only to reestablish native (or indigenous) species. Exotics may be allowed to replace lost species only if they are the nearest genetic relative. Naturally fishless lakes cannot be stocked (USDI NPS 1991). FWS manages fish in wilderness within the National Wildlife Refuge System. FWS stocks only to restore native fish where extirpated or to increase natural diversity, but not for recreational use. Stocking of exotics is prohibited (USDI FWS 1995).

State and federal agency roles in wildlife management have long been a focus of juris-dictional disagreements between agencies and this has hindered development of wilderness fish management programs. The Wilderness Act, Section 4 (d), stipulates that "nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife or fish in the National Forests." The act makes no specific mention of fish stocking. Subsequent wilderness allocation laws have supported this posture. However, in the Endangered American Wilderness Act of 1978 (PL. 95-237) the conference report mentions the intent to continue stocking in the proposed Golden Trout Wilderness to protect and propagate the rare golden trout (HR 95-540 1978). While the states have responsibility for fish management on most federal lands, case law upholds the federal property clause giving agencies, through Congress, the authority to protect and regulate wildlife living on federal land (USSC 1976). Both USFS and USBLM recognize the role of the state in fish management and cooperate with them to ensure coordination offish stocking activities to protect federal resources (USDA FS 1995; USDA FS 1986; USDI USBLM 1992). However, wilderness advocates argue that these federal agencies may be abrogating their responsibility for wilderness protection by allowing fish stocking by the state to occur without proper cooperative assessment of affects on the wilderness resource.

## STOCKING EFFECTS

The introductions of "exotic" species is one major reason for decline of native fish throughout North America (Miller et al. 1989; Minkley and Deacon 1991). A 1994 workshop by Rocky Mountain states fisheries managers recognized the impacts on wilderness of nonindigenous fish stocking. They agreed fish stocking reform in wilderness was necessary to both protect wilderness character and maintain indigenous fish and genetic diversity. All agreed the IAFWA guidelines for wilderness fish stocking needed clarification to refine ambiguous terminology for standard interpretation and use by state and federal agencies (Wiley and Hubert 1994).

Despite many joint agreements between state and federal agencies for cooperative fish programs, inadequate communication and coordination between agencies in developing annual stocking programs has resulted in unilateral stocking decisions which have compromised wilderness naturalness and biodiversity. Such selection of nonindigenous fish for stocking has compromised indigenous fisheries through hybridization, disease, competition, and lack of genetic integrity. Selection has also affected the recovery of threatened and endangered species in wilderness, as in the case of Paiute cutthroat trout, and thus a scientific and ecological value of wilderness is impaired or lost.

Solitude for wilderness visitors is doubly disturbed by stocking. Aerial stocking is disturbing to any visitors in the vicinity and increased use of stocked areas by fishermen can further reduce solitude. Moreover, the increased visitation can compromise a lake's remoteness, impair water quality from human and packstock waste and trampling, and reduce native vegetation in and adjacent to aquatic-riparian ecosystems.

Lack of a standardized terminology has caused inconsistencies in selecting species for stocking. USFS and USBLM use "indigenous" to refer to species naturally occurring in a wilderness area, and "native" to mean species native to the United States; NPS and FWS use "native" for species occurring in an area without human intervention. The NPS and FWS use "exotic," or alien, to mean any species not naturally occurring in an area, whereas to USFS and USBLM it means species foreign to the United States (e.g., the eastern brook trout and rainbow' trout are considered exotics by NPS and FWS in the Rocky Mountain west, but the USFS and USBLM consider them natives).

## REASSESSING FISH STOCKING

Current federal emphasis on ecosystem management to better conserve species biodiversity is a motivating force in reassessing wilderness fish stocking. The USFS has implemented a public involvement process to determine threats to and future conditions of wilderness (Stankey et al. 1985). The USFS and some states are developing specific stocking protocols for individual wilderness plans. They agree that "indiscriminate" stocking without proper ecosystem and species risk assessment is not in the best interest of wilderness. Some states now propose to stock only native or indigenous species in USFS wilderness.

The economics of stocking operations are vital when addressing the continuation of stocking in the large number of wilderness lakes previously stocked, when assessing over-winter survival while looking at the degree to which a species represents a viable sport fishery to the public, and when addressing the potential for disease. Many states now favor a case-by-case

approach to fish stocking that considers impacts and benefits to wilderness waters, as opposed to blanket cessation of stocking to all wilderness lakes. Some managers may revert back to primitive stocking means (e.g., packhorse), rather than aerial stocking, due to costs protecting wilderness solitude and respecting wilderness management tradition.

Stocking practices have improved. The states of Minnesota and the USFS defined annual stocking rates, waters to be stocked, methods of stocking, and species to be stocked within the Boundary Waters Canoe Area wilderness to meet both wilderness and indigenous species needs (Superior NF 1988). The states of Michigan and USFS signed an agreement for fish stocking in the Big Island Wilderness agreeing to maintain or reestablish indigenous species and not stock exotics (Hiawatha NF 1995). The state of Oregon and the USFS are developing wilderness fish stocking protocols (USDA FS 1994) to determine where current stocking may be continued, further evaluation is needed, and stocking will be discontinued. The process is also sensitive to nonfish species, such as salamanders, which are "phylopatric" (i.e., returning to reproduce in the same lake where they were born).

Wilderness preserves or genetic reserves are being proposed to protect indigenous aquatic fauna reduced or eliminated by stocking (Philipp et al. 1993). Examples include a preserve for the yellow-legged frog in California's Sierra Nevada Range (Knapp 1994). In Utah's High Uintas wilderness, a watershed preserve has been proposed to protect the rare Colorado River cutthroat trout (Nickas 1993), while in New Mexico, the state and USFS are restoring Rio Grande cutthroat trout to its historic range within the Pecos and San Pedro Parks Wilderness areas (Stumprf 1994). California has agreed to assess its hatchery and stocking program due to legal action brought by Trout Unlimited (TU), in part due to stocking of nonnative fish in habitats of the rare indigenous Kern River, rainbow and golden trout in the upper Kern Paver in the Dome Land and Southern Sierra Wilderness areas (TU 1993).

USFWS recovery plans for endangered species offer opportunities to recover species affected by nonnative stocking. In California's Carson—Iceberg Wilderness the state is removing all nonnative trout from wilderness watersheds occupied by the threatened Paiute trout. Wilderness serves as a preserve for the trout's survival.

## SUMMARY AND CHALLENGES

Widespread fish stocking in wilderness has often eroded the primeval character and natural condition of areas. The synergistic effects of fish stocking on wilderness must now be addressed by state and federal agencies. Past impact must be acknowledged and new strategies considered. The public sees the inherent conflict in current agency management policies and is confronting them to change their practices. Agencies must jointly reevaluate their policies in order to assure maintenance of wilderness aquatic ecosystems, while at the same time providing for reasonable wilderness recreational fishing opportunities. Jurisdictional responsibilities should be agreed upon to enhance cooperative relations.

Cooperative planning and joint agreements can facilitate a common understanding of the wilderness values. Conservation of species diversity and maintenance of wilderness values can be attained if managers emphasize natural process and ecosystem principles. Leopold cautioned that wilderness is a resource that can only shrink, not grow. With careful planning, public participation, and collective scientific knowledge, managers can put back some biotic quality into wilderness that has been removed by artificial stocking (Leopold 1966). The future challenge is implementation of wilderness stewardship that recognize Leopold's concepts of natural processes and species conservation, and cooperative efforts among agencies working toward this end.

Wilderness protection is not automatically assured by designation. The public is demanding wilderness management accountability and stewardship. Public awareness of wilderness has increased so that fish stocking can no longer be managed in isolation by agencies. State and federal agencies must work together to provide responsible fish stocking protocols to maintain the wilderness resource. **IJW**

**DONALD A. DUFF** is an Aquatic Ecologist with the USDA Forest Service. He is also the National Partnership Coordinator for Trout Unlimited. Don can be reached at the USDA Forest Service, 125 S. State Street, Salt Lake City, UT 84138, USA; (801) 524-6491.

## REFERENCES

AFS. 1976. American Fisheries Society. Management of wilderness area waters. Washington, D.C.: AFS.

Bahls, P. 1992. The status of fish populations and management of high mountain lakes in the western United States. *NW Sci*. 66 (3): 183–193.

Bradford, D. F., F. Tabatabai, and D. M. Graber. 1993. Isolation of remaining populations of the native frog, Rama muscosa, by introduced fishes in Sequoia and Kings Canyon National Parks, California. *Consu Biol*. 7 (4): 882–888.

Hendee, J. C., G. H. Stankey, and R. C. Lucas. 1990. *Wilderness Management*. Golden, Colo.: North American Press.

Hovingh, P. 1994. Personal communication with D. Duff. Salt Lake City, Utah.

Hiawatha National Forest. 1995. Fisheries management within the Big Island Lake Wilderness. Escanaba, Mich.: USDA FS.

Knapp, R. 1994. The high cost of high Sierra trout. *Wilderness Record*. 19: 1–3.

Leopold, A. 1966. *A Sand County Almanac.* Oxford Univ. Press.

Liss. W. J., and G. L. Larson. 1991. Ecological effects of stocked trout on North Cascades naturally fishless lakes. *Park Sci*. 11 (3): 22–23.

Miller, R. R., J. D. Williams, and J. E. Williams. 1989. Extinctions of North American fishes during the past century. *Fisheries* 14(6): 22–38.

Minckley, W. L., and J. E. Deacon, eds. 1991. Discovery and extinction of western fishes: a blink in the eye of geologic time. In *Battle Against Extinction: Native Fish Management in the American West* . Tuscon, Ariz.: Univ. of Ariz. Press.

Murray, M. P. 1994. Reconsidering fish stocking of high wilderness lakes. *Wild Earth* (Fall): 50–52.

Nickas, G. 1993. A proposal for a Colorado River cutthroat trout refugium. *Utah Wilderness Review* Special Edition (Fall).

Philipp, D. A., J. M. Epifanio, and M. J. Jennings. 1993. Conservation genetics and current stocking practices-are they compatible? *Fisheries* 18(12): 14–16.

Reimers, N. 1979. A history of a stunted brook trout population in an alpine lake: a lifespan of 24 years. *Calif. F&G,* 65(4): 196–215.

Schoenfeld, C. A., and J. C. Hendee. 1978. Wildlife management in wilderness. Wildlife Management Institute. Pacific Grove, Calif.: Boxwood Press.

Stumpff, B. 1994. Personal communication with D. Duff. Santa Fe, NM.

Trout Unlimited. 1993. Trout Unlimited Lawsuit Gains Environmental Review of California Fish Hatcheries, Sacremento, Calif., 17 September 1993.

U.S. Congress. HR 95-540. 1978. House Conference Report No. 95-861. Washington, D.C.: U.S. Government Printing Office.

USDA FS. 1986. Policies and guidelines for fish and wildlife management in National Forest and Bureau of Land Management wilderness: an agreement between FS, BLM and IAFWA. In *USDA FS Handbook* 2309.19. Washington, D.C.: U.S. Government Printing Office.

_____. 1990. Forest Service manual, chapter 2640 and 2323.3. Washington, DC: U.S. Government Printing Office.

_____. 1994. Draft fisheries management in wilderness: a process. Portland, Oreg.: U.S. Government Printing Office.

_____. 1995. Fisheries and wildlife management in wilderness. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Agriculture. Forest Service. 1988. Fish and wildlife management within the BWCA Wilderness. Superior National Forest. Duluth, Minn.: USDA FS.

USDI BLM. 1992. Introduction, transplant, augmentation, and reestablishment of fish, wildlife, and plants. *USDI BLM Manual 1745.* Washington, D.C.: U.S. Government Printing *Office.*

USDI FWS. 1995. An ecosystem approach to fish and wildlife conservation. Washington, D.C.: U.S. Government Printing Office.

USDI NPS. 1991. Natural resource management guidelines. *USDI NPS-77*. Washington, DC: U.S. Government Printing Office.

USSC. 1976. *Kleppe v. New Mexico.* U.S. Supreme Court.

Wiley, R. W., and W. A. Hubert, eds. 1994. *Wild trout and planted trout: balancing the scale.* Proc. of workshop May 19–20, 1994, Denver, Colo. Laramie, Wy.: Wyoming Department of Game and Fish.

# Mission Mountains Tribal Wilderness Area of the Flathead Indian Reservation

BY TOM McDONALD

***Editor's note:*** *Indigenous societies, those with ancient, cultural, and physical relationships to specific geographical areas, are an important part of wildlands conservation around the world. Valuable information and insights are found in the traditional practices and beliefs of indigenous people. Today's natural resource managers need to learn from and help protect these traditional values. In many cases, these values and the cultures in which they have evolved are wilderness-dependent. Degradation of wild areas directly impacts the long-term viability of these cultures and their unique gifts to the world. IJW considers this a timely and critical issue, and will explore it through case studies from different cultures and countries.*

*This first article, which summarizes a little-known but significant achievement in Native American natural resource management, is an inspiration for all wilderness managers, advocates, and policy-makers. When one considers that in the United States there are over 300 federally recognized tribes with sovereign authority over at least 44 million acres (18.3 million hectares), much of which is rural, remote, and/or de facto wilderness, it is clear that this pioneering work by the Confederated Salish and Kootenai Tribes in western Montana is an important model. We encourage other American Indian nations to follow their example.*

*—Vance G. Martin*

*The craggy peaks of the Tribal Mountain Wilderness area. Photo credit: Confederated Salish and Kootenai Tribes.*

THE STRIKING PEAKS FOUND in the Mission Mountains of the Flathead Nation (in western Montana) crown a wilderness range unique in the United States both in majesty and management. Standing more than a mile above the farm lands and towns of the Mission Valley, the western front of the range provides one of the most spectacular valley landscapes in the Rocky Mountain region. But the range is more than a natural wonder. It is the first place in America where an Indian nation has dedicated lands to be managed as a wilderness preserve.

The Confederated Salish and Kootenai Tribes are comprised of descendants of Salish (Flathead), Pend d'Oreille, and Kootenai Indians who traditionally had occupied a 20-million-acre (8.3-million-hectare) area stretching from central Montana to eastern Washington and north into Canada. The signing of the Hellgate Treaty of 1855 ceded the vast majority of those ancestral lands to the United States government in return for the approximately 1.243 million acres (518,000 hectares) now known as the Flathead Indian Reservation. The treaty agreement only formalized the tribes' relinquishment of their lands; events long preceding the Hellgate Treaty event had guaranteed this eventual loss.

In the words of Issac Stevens, then governor of the Washington Territory, the treaty gave access to "much valuable land and an inexhaustible supply of timber" and enabled "settlers to secure titles to land and thus the growth of towns and villages." The loss of this vast wilderness meant the potential loss of traditional Indian society Every aspect of the Indian culture, from hunting and food gathering to religious practices, was dependent upon the surrounding wilderness.

To the Salish, Pend d'Oreille, and Kootenai Indians, the Mission Mountains were one part of this wilderness homeland, distinct in its ruggedness and extreme weather but no wilder than anywhere else. And, like other features of the landscape, the Mission Mountains influenced the culture and the economy of the tribes. The area could be crossed only through certain passes, used for hundreds of years by many different tribal bands and still used today for hunting, fishing, plant gathering, and cultural activities.

## TRIBAL PROCESS TO PROTECT WILDERNESS

The first attempt by the tribes to officially protect the Mission Range occurred in 1936, during a period of extensive trail construction by the Indian Civilian Conservation Corps in the mountainous areas of the reservation. The tribal council voted to set aside about 100,000 acres (41,666 hectares) of the western slope of the Mission Mountains as an Indian-maintained national park. The tribes were to retain ownership of the lands but planned to parallel National Park Service management practices in its administration of the area. The main goals were to encourage tribal member use of the park with traditional encampments and activities and to provide an economic opportunity for Indian guides to bring visitors into the park. Nothing ever came of this tribal council action. Correspondence suggests the idea dissolved in Washington, D.C., in the office of the Commissioner of Indian Affairs where trust responsibilities for the Flathead Nation were administered.

Ironically, one year later in 1937, the Mission Range was classified as a roadless area by the same Office of Indian Affairs, but the tribes objected

because it was classified without their consent or input and some of the land was determined to be better suited for other uses by the tribes. Ultimately the Mission Range Roadless Area was announced as declassified in the *Federal Register* in 1959.

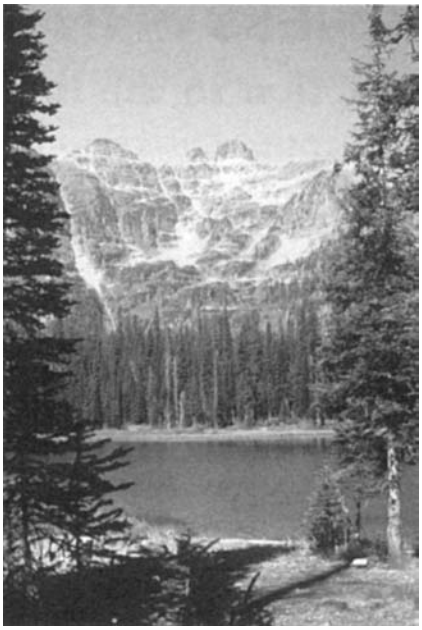
During the mid-1970s, the Bureau of Indian Affairs Flathead Agency proposed to log portions of the remaining roadless area on the western front of the Mission Range on behalf of the tribes. The proposal fueled a renewed interest in preserving the Mission Mountains in a natural state and in 1979 the tribal council decided to set aside approximately 91,778 acres (38,240 hectares) as a tribal wilderness.

This decision arrived through the efforts of a number of tribal members and groups. Three greatly respected grandmothers (Yayas) raised the initial protest to the proposed logging and led the way for other community leaders to organize the Save the Mission Mountains Committee, to stop timber sales proposed for the area. The committee circulated a petition in 1975 asking the council to designate a Mission Mountains Primitive Area in which logging would be banned. Soon after this, the council seriously began to consider some type of wilderness protection.

Several proposals were advanced, all of which lacked sufficient protection considerations other than that logging would be prohibited. A proposal citing the least acreage included only those lands not feasible for timber harvest. Advocates of this proposal were concerned about loss of income from reduced access to commercial timber lands.

The Save the Mission Mountains Committee proposed a boundary that came to the base of the mountain range, and included private and roaded lands, but this made it politically not viable. Their interest centered on protecting aesthetic values and preserving the overall wilderness character of the area, thereby helping to retain some of the cultural and spiritual values important to the tribes.

In 1976, the tribal council, at the recommendation of Thurman Trosper (a tribal member, retired U.S. Forest Service employee, and past president of The Wilderness Society), contracted with the Wilderness Institute at the University of Montana to develop a draft boundary and management proposal for a Mission Mountains Tribal Wilderness Area. Two years later the institute presented the drafts to the council for review. These represented a compromise of previous proposals. The council took no immediate action on the institute's management proposal and boundary, but a year later they approved the draft boundary and created a new tribal program to oversee the interim management of the area. This tribal program, called



*Mission Mountains Tribal Wilderness Area. Photo credit: Confederated Salish and Kootenai Tribes.*

the Wildland Recreation Program (WRP), was also charged with developing a wilderness management plan to meet the specific needs and values of the tribes.

The WRP completed the plan in the spring of 1982 and on June 15 the council voted overwhelmingly to approve Ordinance 79A, the Tribal Wilder ness Ordinance, and the Mission Mountains Tribal Wilderness Management Plan, designating 92,000 acres (38,333 hectares) as wilderness. The council's action was historic. It was the first time that an Indian tribe had decided on its own to protect a sizable portion of its lands as wilderness, and to commit policy and personnel to fulfill that purpose. The first section of the Tribal Wilderness Ordinance states that, "Wilderness has played a paramount role in shaping the character of the people and the culture of the Salish and Kootenai Tribes; it is the essence of traditional Indian religion and has served the Indian people of these tribes as a place to hunt, as a place to gather medicinal herbs and roots, as a vision seeking ground, as a sanctuary, and in countless other ways for thousands of years. Because maintaining an enduring resource of wilderness is vitally important to the people of the Confederated Salish and Kootenai Tribes and the perpetuation of their culture, there is hereby established a Mission Mountains Tribal Wilderness Area and this area, described herein, shall be administered to protect and preserve wilderness values."

*Wilderness is ... one part of the Indian culture that remains as it was. Its preservation expresses reverence for the land and its community of life, as well as respect for Indian culture.*

The tribal council continued its historical precedent by following through with specific management actions to fulfill the wilderness mandate. A Mission Mountains Grizzly Bear Management Plan was written to foster greater care of one of the wilderness' greatest, but threatened, resources. A Mission Mountains Tribal Wilderness Fire Management Plan was developed to facilitate reintroduction of natural fire to the wilderness ecosystem, and a Mission Mountains Wilderness Buffer Zone Plan (for the 23,000-acre [9,600-hectare] surrounding zone) was created to cushion the wilderness from outside influences that might impact its integrity.

Other special management direction/regulation was developed primarily for nontribal members, and today include the following:

- Use of any tribal lands or waters by nontribal members requires the purchase of a tribal conservation license and the appropriate activity stamp (fishing, bird hunting, or camping), and this requirement applies to use of the wilderness lands.
- A group size limit of eight persons and eight head of packstock applies to the wilderness lands.
- Use of a campsite for longer than three consecutive days is prohibited.
- It is illegal to carry or use firearms.
- A spring stock closure helps protect pathways from erosion.
- No commercial use of wilderness (outfitters or professional guides) is allowed.
- A 10,000-acre (4,166-hectare) zone is closed to all human use between July 15 and October 1 of each year to protect critical grizzly bear habitat and maintain visitor safety.
- Fisheries management gives special attention to waters containing native west slope cutthroat trout and native bull trout.

The first Flathead Nation wilderness manager stated: "Wilderness is, to a segment of the tribal population, vitally important. It is one part of the Indian culture that remains as it was. Its preservation expresses reverence for the land and its community of life, as well as respect for Indian culture." **IJW**

**TOM McDONALD** has been the Wildland Recreation Program Manager for the Confederated Salish & Kootenai Tribes since 1988. He can be reached at: the Tribal Office, Box 278, Pablo, MT 59855, USA.

# WILDERNESS @ INTERNET

## Introduction to the Internet

### BY ADRIAN PFISTERER

*IJW is geared to wilderness in the future and its importance to humankind. The Internet, as a rapidly expanding source of information accessible to ordinary citizens as well as wilderness specialists, will be part of that future. In this first issue of IJW, we will begin regular coverage of wilderness issues on the Internet, including instructions for accessing information, reviews of "home page" sources, bulletin boards, and other tips. Send us your ideas.*

THE INTERNET, FOR THOSE NOT FAMILIAR, is a loosely organized network of computers, both personal and business, scattered throughout the world. It was created approximately 22 years ago by the U.S. Department of Defense with the initial purpose to support military research. The Internet has since been used more and more by universities, businesses, and even private citizens in their own homes. Recent advances in telecommunication technology, home computers, software, and technical skills of "normal" citizens have all contributed to explosive growth in traffic on the Internet.

Perhaps the most important event in the evolution of the Internet has occurred over the last two years: the presence of the World Wide Web (WWW). This entity and its associates software (known as Web browsers) have become *the* application for the Internet. The WWW is to the Internet today what Lotus 1-2-3 was to the IBM personal computer in the early 1980s. Web browsers have allowed technically average people to access the Internet through an action as simple as clicking on the mouse button. With a Web browser you can view text, pictures, sound, and even video (if your hardware supports it) on the Internet.

There are numerous "locations" on the Internet where one might get information about wilderness. These locations come in the form of Uniform Resource Locators, called "homepagers." For example, The Wilderness Society's homepage lists more than 20 specific topics one can access for detailed information and write-ups on the California Desert Protection Act, grazing on public lands, ancient forests of the Pacific Northwest, and so forth. **IJW**

**ADRIAN PFISTERER** is a software engineer with Micron Technology in Boise, Idaho. He can be reached via e-mail: APFISTER@A4icron.net.

## Cyberwild

### BY BLASE REARDON

EXPLORING THE INTERNET FOR WILDERNESS INFORMATION? Suppose you've got a question for other wilderness managers. You could ask the question via electronic mail, especially if it's not urgent enough for phone calls and not important enough for letters. With e-mail, you'd only have to ask the question once. But the National Park Service, the Bureau of Land Management, the Fish and Wildlife Service, and the Forest Service have separate computer networks. Your eyes glaze over when the system manager tries to explain how to mail messages between those networks. So how do wilderness managers in different agencies share ideas and discuss problems via e-mail?

One solution for improving interagency electronic communication is a powerful, automated mailing list called *Interwild-L*. This automated list distributes wilderness-related messages much the same way as a radio station broadcasts songs. The software behind the mailing list, called a mail server or listserv, can process hundreds of messages to different networks almost instantaneously, and it allows any subscriber to send messages to all other subscribers.

Because it's automated, *Interwild-L* has several advantages over a mailing list set up in a personal e-mail account or Data General profile. Users subscribe by sending a message directly to the mail server, which automatically adds names to its address lists. *Interwild-L* then responds with a welcome message explaining commands for sending messages. Cancelling your subscription is also automatic; users send another message directly to the mail server, which automatically deletes names from the *Interwild-L* address list. Lastly, *Interwild-L* deletes any returned messages before they fill senders' accounts or inboxes.

Subscribing to *Interwild-L* is free, and open to any U.S. Department of Interior or U.S. Department of Agriculture employee interested in wilderness. The Arthur Carhart National Wilderness Training Center (ACNWTC) sponsors the list, and the Institute for Global Communications (IGC), a nonprofit organization in San Francisco, operates the mail server for the ACNWTC. *Interwild-L* links you to a network of wilderness managers across the country—seasonal wilderness rangers, specialists, outdoor recreation planners, and line officers from the four agencies that manage the National Wilderness Preservation System. You can post announcements, share ideas and expertise, or ask for help. In addition, you can look for job vacancies, listen to other managers' discuss wilderness education and management issues, and learn what solutions people are developing across the country.

To subscribe, compose an e-mail message for: *"majordorno @igc. apc.org."* Leave the subject line blank. On the message line, type *"subscribe interwild"* followed by your name. Don't include the quotation marks in the address or your message. Send the message. Within a day, you'll receive a welcome page detailing how the *Interwild-L* mail server works. *Interwild-L* won't overload your inbox or already full schedule. Activity on *Interwild-L* tends to be sporadic—quiet stretches punctuated by short flurries of discussion. *Interwild-L* will, however, help you find resources, develop contacts, expertise, keep you informed about wilderness issues nationwide, and provide a forum for sharing your knowledge and concerns.

For more information about *Interwild-L,* contact Rob Hellie at (202) 452-7703 or *rhellie@wo0033wp.wo.blm.gov.* To learn more about setting up a mail server, contact IGC Networks, 18 De Boom Street, San Francisco, CA 94107, USA; (415) 442-0220.

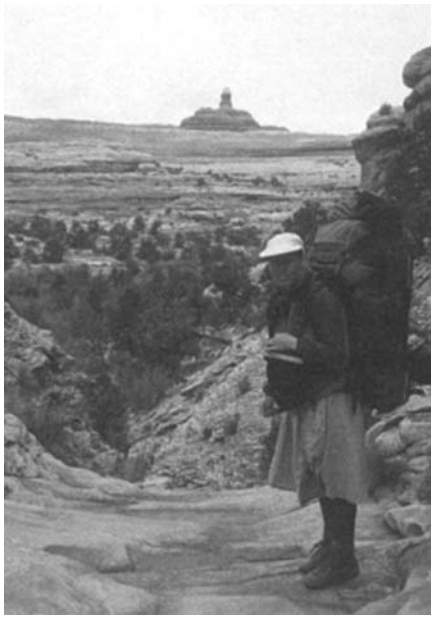
If you have questions on electronic communications in general or would like to share information on other programs, systems, or databases, write to Wilderness @ Internet Editor c/o the Managing Editor, *International Journal of Wilderness.* **IJW**

**BLASE REARDON** is writer-editor for the Kootnei National Forest, Libby, Montana 59923 USA, and can be reached at (406) 293-6211.

# Outward Bound and Wilderness

**BY KATRINA S.ABBOTT**

THE STORY OF AN ORANGE PEEL on the ground during an Outward Bound course is a wonderful example of the value of wilderness and its impact on people. I was one of two instructors for an Outward Bound program for a group of thirteen students, one of whom was an intern from a high school in New York City. The intern had been on a similar overnight trip the previous year and except for him, this was the first time any of these students had been backpacking. To many of them, the "ground" was still the "floor." As I walked at the end of the line, talking with the intern, he stopped and picked up an orange peel that one of his group members had dropped. He turned to me and somewhat angrily said, "What do they think they are doing, dropping orange peels on the ground?" When he asked why they had dropped the peels, his fellow urbanites responded that their habit of dropping trash on the ground was "because there is always someone there to pick it up in the city."



Article author Katrina S. Abbott.

The power of that moment, for me, was that this young man had internalized an environmental ethic and a sense of responsibility for the natural world during his prior Outward Bound experience, and this quality found expression in action. He intuitively appreciated the value of the natural world and provided his peers with a role model of earth stewardship. During an Outward Bound course, students have the opportunity to experience nature in a way that allows them to understand its intrinsic value, beyond the utilitarian value of providing raw material for human use (Meyer 1978). Invariably, they begin to take an interest in environmental stewardship.

Being in the grandeur and beauty of wilderness is a primal experience. It elicits a sense of connectedness to something greater than ourselves and expands our sense of self. The wilderness, a neutral environment devoid of human infrastructure, demands that individuals adopt responsible behavior to ensure their comfort and well-being. For most, the wilderness is a novel environment that requires new responses and behaviors. Experiencing our self in nature is not easy to do in a world dominated by human activity. Thus, while many seasoned Outward Bound staff have provocatively mused that an Outward Bound course "can be conducted under a kitchen table," a wilderness setting creates the potential for a profound and compelling experience for each participant.

Outward Bound in the United States and the wilderness are intimately linked. The term "outward bound," originally used by seamen to describe the moment when a ship leaves a safe harbor and heads into the open sea portending adventure and challenge, is a perfect metaphor for the curriculum of a modern-day Outward Bound course. Today, a diverse group comes together to experience a journey into the unknown—the wilderness.

During an Outward Bound course, students may climb mountains, paddle rivers, and sail the seas, both for the challenge and joy of the experience and, as a means to an end; the reason to climb is not necessarily to reach the top, but to acquire the understandings that arise from the journey itself. It has been eloquently said that "Outward Bound trains through the sea and not for it" (Miner 1981). The essence of the Outward Bound process is the exposure of students to activities that require responses that have meaning beyond the activity, thus serving as metaphors which are isomorphic (Bacon 1993), or similar in structure, to responses they might successfully make in their home environment. In this way, students learn new and better ways of addressing issues, ways that can be transferred to their daily lives.

Outward Bound experiences require sustained physical, mental, and emotional effort over fully scheduled consecutive days. They often take place in an environment unfamiliar to the students, which requires a fresh approach and impels individuals to work together as a team to attain their goals. As knowledge and trust in each other increases, communication becomes more direct and honest, and deeper connections are established among students. The value of individual uniqueness and ability becomes apparent and appreciated and each student comes to understand what they bring to the group. Throughout the experience, activities are reflected upon and discussed so individuals retain their import. "It's been six years since I've been on my course," a student wrote "and there's not a day that goes by that I don't think about it and apply it to my everyday things I have to do—job, school... I never forget."

## IN THE BEGINNING

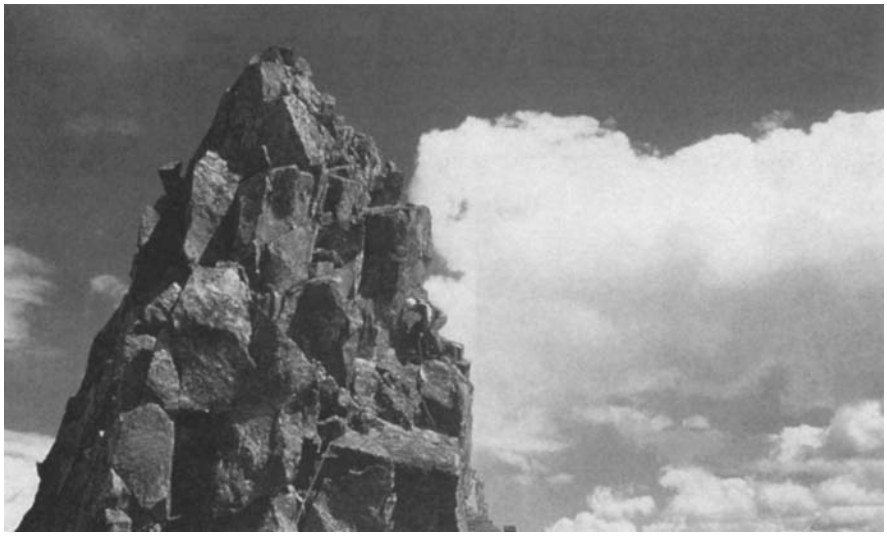
The first Outward Bound course was conducted in Aberdovey, Wales, in 1941. It was designed to help young men, who were products of years of depression in Britain, to "defeat their defeatism." Through sail training and rescue service, the students at the first Outward Bound school cultivated physical health and a sense of moral responsibility. Kurt Hahn, the founder of Outward Bound, believed strongly in the need for value oriented education, with a mix of physical, academic, and service learning. He wrote, "I regard it as the foremost task of education to ensure the survival of these qualities: an enterprising curiosity, an undefeatable spirit, tenacity of pursuit, readiness for sensible self-denial, and above all, compassion" (Sakofs 1988). Hahn, an innovative German born educator, created and developed a number of schools around the concept of experiential education or "learning by doing."

Josh Miner, an American teacher who worked with Hahn in Britain, brought Outward Bound to the United States, and in 1961, the Colorado Outward Bound School was created. Today, the Hurricane Island Outward Bound School (Maine), North Carolina Outward Bound School, Pacific Crest Outward Bound School (Oregon), and the Voyager Outward Bound School (Minnesota) offer wilderness courses, while the New York City Outward Bound Center and the Thompson Island Outward Bound Education Center (Boston) offer primarily urban programs.

While there are now more than forty Outward Bound schools on five continents and twenty-nine countries around the world, Kurt Hahn s influence has spread beyond Outward Bound to over 700 experiential education programs and numerous professional associations across the United States, including the National Outdoor Leadership School, Project Adventure, Association for Experiential Education, and the Wilderness Education Association.

## THE OUTWARD BOUND CURRICULUM

While each of the Outward Bound schools in the United States conducts courses in very different environments, the core curriculum of any course has five basic elements: training phase, expedition phase, solo, final phase, and concluding phase. The curriculum relies heavily on the instructors



*Facing and conquering challenges is at the heart of the Outward Bound experience.*

use of Socratic questioning for the students' acquisition of knowledge, guiding students to learn through their own experience.

During the training phase of a wilderness course, students learn skills necessary to safely engage in high adventure activities and become members of a functioning group, with increasing responsibility for leadership of the group. The expedition phase tests the students' knowledge through opportunities to experience safe, yet real success and failure. A day or two of service work, such as working at a homeless shelter or trail rehabilitation, gives students a chance to understand compassion through service to others and to the land through which they travel. On solo, the student experiences the wilderness in solitude, with up to three days of reflection with a minimum of food and equipment. A final expedition requires that the students use all the knowledge they have gained to safely reach a predetermined destination. A concluding physical event, such as an endurance run or ski marathon, offers the students a final opportunity for an individual challenge and a dramatic closure to their course. Reflection and discussion on their experience and its import often take the form of metaphors which students can apply to their daily lives, thus allowing the lessons learned and awareness gained during the Outward Bound course to be available for later application.

Although a "standard" course is 23–26 days in length and primarily conducted for youth between the ages of 16–24, Outward Bound courses vary from 4–80 days and serve such diverse populations as families, adults over 55, educators, and corporate work groups, and are offered throughout the United States and in a number of foreign countries including Costa Rica, Mexico, and Nepal.

## OUTWARD BOUND AND THE WILDERNESS

With a threefold increase in students over the past 15 years, Outward Bound USA has grown to five wilderness schools and two urban centers and currently serves more than 34,000 students a year (Glenn 1994). Many of these students have an extended wilderness experience, living outside, sleeping on the ground, exploring the land around them, and leaving their Outward Bound course with a much stronger connection to Earth. It is this intimate knowledge of themselves in a natural place, combined with the acquisition and use of low impact skills, that helps Outward Bound students internalize care of and concern for the wilderness.

As wilderness use increases, Outward Bound students and other users must adopt practices that will minimally impact our resources, including use of state-of-the-art low impact techniques and self-regulation. For example, we have been expanding into water environments through sailing and sea kayaking courses, while consciously traveling less in over-impacted wilderness areas. Outward Bound staff firmly believe that continued access to wilderness areas is a privilege and not a right. This privilege is earned by being exemplary users in the natural environment, and exemplary teachers for future users of the environment (Hart 1993).

In 1990 the Outward Bound Environmental Affairs Committee was formed with representatives from each of the seven US. Outward Bound schools. The committee provides national leadership for Outward Bound's environmental education and stewardship, and addresses the critical public policy issues facing outdoor education and recreation organizations today, including wilderness allocation and management, risk management, user fees and permit standardization, mitigation of environmental impacts (including Limits of Acceptable Change research and "Leave No Trace" education and practice), and climbing and fixed anchors in the wilderness.

The sustainability of wilderness and all natural resources is one of Outward Bound's highest priorities and we continue to address this issue through four avenues in particular: partnerships, wilderness and environmental education, stewardship, and diversity (Mackey 1994).

## PARTNERSHIPS

Wilderness use is projected to increase as much as 135% by the year 2040 and federal funding may not keep up with this increase (Mackey 1994). Partnerships between federal agencies and other organizations can support the stewardship of our resources, given this increased use. Outward Bound, for example, has been working for many years in partnership with the U.S. Forest Service (USFS) assisting in the education of wilderness users, building and maintaining trails, monitoring campsites, and providing rescue support. A specific project in Colorado gives Outward Bound students the opportunity to work side by side with the USFS employees on the "Fourteeners Initiative," a project designed to mitigate the human impacts on the fifty-four 14,000-foot peaks in Colorado.

While most Outward Bound courses are conducted on public lands, students in the eastern United States often travel through land owned by corporations and private citizens, with whom Outward Bound has agreements for use. On private lands, as on public lands, continued access cannot be assumed and local Outward Bound site managers work each year to maintain positive relationships with private land owners.

Two top priorities for Outward Bound over the years have been self-regulation of environmental impact and managing participant safety. The privilege of taking students into the wilderness requires that we take care of the land and ourselves on the land. To this end, for over 15 years, Outward Bound has had a strong national

infrastructure for safety and quality management and education.

## WILDERNESS AND ENVIRONMENTAL EDUCATION

The majority of Outward Bound program activity takes place in the wilderness. Environmental education is partnered with physical and spiritual self-discovery, enabling students to experience themselves as a part of the natural world. For three decades Outward Bound has been at the forefront of low impact wilderness education. When students come to Outward Bound, they learn to respect the land, employ low impact skills, and give back to the land through service. Through publications, such as *Wilderness Ways,* a guide for environmentally sound back country travel, and the *EarthBook,* a book of activities and readings for environmental education, appreciation, and celebration, Outward Bound has been able to share its practices not only with its students but with other organizations worldwide as well.

## STEWARDSHIP OF NATURAL RESOURCES

Active service to the environment is part of the Outward Bound student experience. Through service work such as trail and campsite rehabilitation, visitor education and river cleanups, Outward Bound students come to understand that they, too, can make a difference in the stewardship of the natural world. It has been estimated that in 1993 alone, Outward Bound students and staff provided 6,500 days of environmental service work, mostly on public lands. This active care for the environment enhances students' sense of responsibility for Earth and is an attitude and understanding which they are likely to take away from their Outward Bound experience. This attitude will help preserve the wilderness for future generations.

## DIVERSITY

Diversity is an integral part of all Outward Bound experiences. Kurt Hahn believed that the "student constituency" of every Outward Bound course should be as "broad as possible" (Miner 1991). Today, "Outward Bound aims to provide a diverse mix of participants on its courses, in the belief that a wide variety of perspectives and life experiences contribute to a rich learning environment. Believing the same holds true for our employees, we have made serious efforts to diversify our staff and board of trustees" (Glenn 1995). One of the missions of Outward Bound is to increase the diversity (socioeconomic, physical ability, gender, ethnic, and racial) of its participants and staff at all levels of the organization. To this end, nearly two million dollars was raised in 1993 to fund scholarships for students to attend Outward Bound courses.

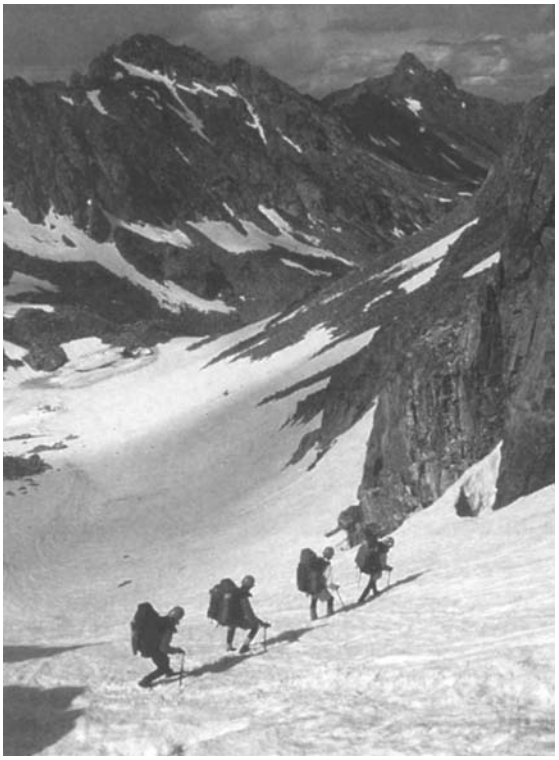
The Native, African, Asian, Latin American (NAALA) Institute has been created within Outward Bound to help promote efforts toward increasing ethnic and racial diversity. The Director of Diversity and the NAALA Institute has been hired to support and coordinate efforts toward increasing diversity within Outward Bound USA.

As we continue to reach into more urban and school environments, Outward Bound has the opportunity to offer an outdoor experience to youth who might not otherwise be able to experience the natural world. Given the increasingly diverse nature of the United States demographics, it is imperative that as many citizens as possible experience and come to understand the value of the natural world so each will support its protection.

## OUTWARD BOUND, WILDERNESS, AND THE 21ST CENTURY

Kurt Hahn, the founder of Outward Bound recounted often that "our disability is our opportunity" and as Outward Bound approaches the 21st century, we are finding that one disability, degradation of our wilderness, is an opportunity to find ways to educate people, locally and globally, about concern and care for the environment.

Environmental stewardship education is most easily understood while in the wilderness. During a course, the wilderness provides Outward Bound students with a profound, life-changing experience and we will continue to look for ways to responsibly offer our students a wilderness experience.



Outward Bound schools operate in some of the wildest wilderness areas in North America and the world.

> … Going to the mountains is going home; wildness is necessity; and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life.
>
> —John Muir

Education about the natural world should not only be offered to those that are or want to venture into the wilderness. Believing that all citizen should know about and experience the natural world, Outward Bound has taken its philosophy and pedagogy to urban environments such as New York, Boston, Baltimore, and Atlanta, and focused on introducing urban youth to the natural world and service.

A new and successful urban initiative, Expeditionary Learning Outward Bound, is transforming public schools across the country into centers of educational excellence for grades kindergarten through high school. During a multidisciplinary study of the natural world, a first and second grade class focused on a study of human impact on the environment through

River rafting and specially designated exercises teach the value of teamwork and cooperation.

a six-week "learning expedition" titled "Walk Lightly on the Earth."

These urban programs are strongly supported by wilderness experiences, and often students prepare throughout a year of school for an Outward Bound experience in the wilderness. Teachers, principals, and superintendents associated with Outward Bound come to understand how to transform their schools into learning environments based on Kurt Hahn's philosophy after experiencing a wilderness course. After an Outward Bound experience, a school principal wrote, "I experienced nature on a very personal basis. Metaphors from each day's experiences can fill a book and I will continue to bring those metaphors into my work life and private life every time I encounter a challenge."

Concerns for environmental stewardship are important worldwide, and Outward Bound has taken the initiative to share its best environmental practices throughout its global network of schools. In 1993 Outward Bound staff from the United States and overseas joined with federal land agency staff and other environmental educators for the first International Outward Bound Wilderness Programming Conference to discuss land stewardship issues, share best environmental practices, and create partnerships for the future. In October 1994, in Hong Kong, the Fifth International Outward Bound Conference participants focused on global environmental concerns during numerous workshops and forums. In this next century, Outward Bound will continue to look toward stewardship of the global environment through collaboration, partnerships, and education.

Outward Bound will continue to take students into the wilderness, and in doing so, monitor our impact and respect of this limited resource—the wilderness. We will continue to instill a sense of responsibility in our students for care of the natural world, with the hope that they will recognize that an orange peel on the ground is not part of the wilderness experience. As Outward Bound changes and moves into the 21st century, we need to leave the safety of our harbor and travel into the unknown, always seeking new ways to help our current and future caretakers of the wilderness to intimately understand it with their heart. **IJW**

"For the care of rivers is not a question of rivers but of the human heart."

—Tanaka Shozo

**KATRINA S. ABBOTT** has been working for Outward Bound for the past 15 years as an instructor, both in the United States and Costa Rica, and as the manager of a base camp with environmentally sound facilities in North Carolina. Currently she is the Coordinator of Special Projects for Outward Bound USA.

## REFERENCES

Anderson, L. 1993. Compass, *The Outward Bound Alumni Newsletter.* Garrison, N.Y.: Outward Bound National.

Bacon, S. 1983. *The Conscious Use of Metaphor in Outward Bound*. Denver, Colo.: Colorado Outward Bound School.

Colorado Outward Bound School. 1992. *Instructor's Manual*. Denver, Colo.: Colorado Outward Bound School.

Crenshaw, L., ed. 1994. *EarthBook*. Morganton, N.C.: The North Carolina Outward Bound School.

Glenn, L. 1994. *Outward Bound USA Safety Report—1994*. Garrison, N.Y.: Outward Bound USA.

Glenn, L. 1994. Diversity Works. In *Outdoor Recreation Coalition of America* pamphlet. Boulder, Colo.: ORCA.

Greene, J. H., and D. Thompson. 1991 Outward Bound USA. *Adventure Education*. J. Miles, and S. Priest, eds. State College, Pa.: Venture Publishing Inc.

Hunt, J. S. 1986. *Ethical Issues in Experiential Education*. Boulder, Colo.: The Association for Experiential Education.

Hurricane Outward Bound School. 1993. *The Instructor's Field Manual*. Rockland, Maine: Hurricane Outward Bound School.

James, T. 1980. *Education at the Edge*. Denver, Colo.: Colorado Outward Bound School.

Litz, B., and L. Anderson. 1993. *Wilderness Ways.* Denver, Colo.: Colorado Outward Bound School.

Meyer, D. 1978. The outlook for educational use of public lands. *Journal of Experiential Education*. Boulder, Colo.: Association for Experiential Education.

Miner, J. L. 1991. The creation of Outward Bound. *Adventure Education*. John Miles, and Simon Priest, eds. State College, Pa.: Venture Publishing Inc.

Miner, J. L., and J. Boldt. 1981. *Outward Bound USA*. New York: William Morrow & Co.

North Carolina Outward Bound School. 1994. *The Instructor's Handbook*. Morganton, N.C.: North Carolina Outward Bound School.

*Proc. of the Fifth International Outward Bound Conference,* October 24–28, 1994. Hong Kong: Hong Kong Outward Bound School.

*Proc. of the International Outward Bound Wilderness Programming Conference,* September 14-18, 1994. Denver, Colo.: Colorado Outward Bound School.

Richards, A. 1991. Kurt Hahn. *Adventure Education*. J. Miles, and S. Priest, eds. State College, Pa.: Venture Publishing Inc.

Sakofs, M. 1988. Outward Bound: An adventure-based pedagogy for personal growth. *Holistic Education Review, Vol*. I, No. 3, pp 48–51. Greenfield, Mass.

Thompson, D., and S. Bacon. 1987. Outward Bound in America: past, present and future. *The Highest Use of Wilderness.* J. Hendee, ed. In Proc. of a Special Plenary Session at the 4th World Wilderness Congress. Moscow, Idaho: The Wilderness Research Center.

Wilson, R. 1981. *Inside Outward Bound*. Charlotte, N.C.: The East Woods Press.

# The Vision Fast—

## *Wilderness as a Therapeutic Source of Self-Discovery*

**BY STEVEN FOSTER**

*Article author Dr. Steven Foster is cofounder and director of the School of Lost Borders in Big Pine, California (above) Desert wilderness, shown here on the edge of Death Valley in California, provides the space and at is ideal for Vision Fast programs (left).*

FOR UNTOLD THOUSANDS OF YEARS, our indigenous ancestors practiced a primitive form of "psychology" that was nevertheless so effective it ensured the continued survival of our species. This "psychology" flourished among indigenous tribes throughout most of the human occupied world and focused on rites of passage guiding tribal members through some of the potentially disruptive personal life transitions that might otherwise have jeopardized tribal welfare and safety. Sanctioned by tribal society, these rites confirmed the passage of the young to adulthood and the mature to ever more mature states of being. Our primitive ancestors, however, would never have called these practices a "psychology." They knew the practices as rites of passage, or "initiation."[1]

*A deeper taproot connects the Vision Fast to what Jung called the "collective unconscious," the ancestral memories of our species, graven in our genes. In a practical sense, our wilderenss Vision Fast program was developed in response to the blinking red lights on our phones in the Marin County Suicide Prevention Hotline Room.*

Such rites of passage ordinarily took place in wilderness settings, outside of the village or camp. Everyone paid careful attention to these activities, for the health of the community depended on their successful outcome. Participants in the rites also gained great benefit, for the therapy they experienced was far more complete than what we call "therapy" today. The rites went beyond mere personal or community health. They were the fertilizer in which the people grew an identity through their stories about themselves and all their earthly relatives, myths, legendary leaders, sacred ancestors, and symbols of unity, health, and regeneration. The rites guaranteed the vitality of their imagination, enriching psyche, mind, and spirit.

Today, we can learn much from understanding these early wilderness psychology practices that were so functional to the survival of primitive cultures. The same problems they addressed are relevant in today's culture. Thus, it is no wonder the same psychological processes are being rediscovered and applied through a growing number of wilderness experience programs and that a new field of "ecopsychology" is emerging.

### ANCIENT WILDERNESS PSYCHOLOGY

The mythical, religious heroes and leaders associated with the wilderness passage rite tradition are legion and form the foundations of the belief systems of the world, even today. Jesus, Moses, Mohammed, and the Buddha are among those who sought inspiration and wisdom in the wilderness.

The wilderness passage rite tradition is illustrated in the famous indigenous peoples' story of "Jumping Mouse," who, because he heard a roaring in his ears, left his innocent childhood behind and went into the great wilderness to quest for a vision.[2] There he met Raccoon, who introduced him to the Sacred River (Nature). Beside the river he was initiated by Raccoon and Frog, and given directions to unlock the meaning of his life story. The saga of Jumping Mouse then continued as the little mouse searched for "the sacred mountains, shining in the distance" (the meaning of life).

The first part of the story, "Mouse, Raccoon, and the Sacred River," symbolizes the initiation process, the dynamic of a rite of passage. In anthropological terms, the first phase is called "severance." Little Mouse left his past and his familiar life behind. He severed connection from his childhood. The second phase is called "threshold." Little Mouse went alone into the great initiation place and came to the Sacred River, where, by dint of his own efforts, he caught a vision of the "Sacred Mountains shining in the distance." The third phase is called "incorporation," or "reincorporation." Little Mouse became Jumping Mouse. His new name signified an earned maturity and a personal story that made mythical meaning of his life. Then, changed by his vision, he left his past behind and went in search of the Sacred Mountains. Eventually he arrived, blind and alone, at his destination, where the ultimate transformation awaited him.

## MODERN WILDERNESS RITES

The modern wilderness rite, called the "Vision Fast," is a process that my wife, Meredith Little, and I have been involved with for over twenty years. Our work in this area began by leading Vision Fasts and, for several years now, training other leaders. The Vision Fast is an attempt to bring back, at least partially, the therapeutic effectiveness of indigenous rites of passage in the wilderness. However, full effectiveness of such rites cannot be attained until they are again sanctioned by the culture. Such acceptance, while still limited, is emerging. At the present time, the numbers of people who recognize the intrinsic value of these experiences are growing, reflected by the increasing numbers of wilderness experience programs, even as "ecopsychology" courses multiply within institutions of higher learning.

The modern Vision Fast, as we practice it, is rooted in several disciplines: the humanities (folklore, mythology, philosophy, and symbolism); the social sciences (anthropology and psychology); the natural sciences (ecology); and outdoor, experience-based education (e.g., Outward Bound, National Outdoor Leadership School). A deeper taproot connects the Vision Fast to what Jung called the "collective unconscious," the ancestral memories of our species, graven in our genes.

In a practical sense, our wilderness Vision Fast program was developed in response to the blinking red lights on our phones in the Marin County Suicide Prevention Hotline Room. Our tutors were several Native American "medicine men," a couple of excellent field biologists, psychotherapists, a prominent social anthropologist, thousands of people who came to our school, and, of course, all those years we spent in the field, exposed to the therapeutic influence of nature.

As the years passed and we gained experience in what we were doing, various aspects of our program changed to reflect our new insights about the three phases of the ancient initiatory process and how to best present them today. But the core process remained the same, involving the three phases: severence, threshold, and incorporation.

## THE CORE PROCESS OF THE VISION FAST

Severence: Like little Jumping Mouse, our "clients" sever from the past. Some of this severance involves preparation to enter and survive the wilderness experience or threshold phase. We prefer that clients spend six months anticipating and preparing for their Vision Fast experience. Emphasis is not placed on the life issues or problems that brought them to the program *per se,* but on the intent—that is, what he/she would confirm by this act of leaving the past behind and taking on the "taboos" of the threshold, such as fasting alone. When the person returns from the threshold phase to begin the incorporation phase, this intent is then fully "owned" according to the ancient therapeutic formula.

Sitting in council, Vision Fast participants integrate the wilderness experience (incorporation) to return to ordinary life with a new level of self-understanding and acceptance.

Threshold: When our "client" enters the threshold phase, she/he goes into the wilderness for a period of time up to four days. During this time of "threshing," three of the old liminal taboos are observed: no food (hunger), no company (loneliness), no shelter (exposure)—except for a small tarp and some rope. Though the safety of the participants is carefully monitored, they have no contact with each other or the guides unless they chose to initiate it. Alone in the great body of the wilderness, without social distractions, they experience a heightened awareness of their bodies, their emotions, feelings, and thoughts. They are compelled to be more inward and reflective and develop a more careful, clear-eyed attention to the details of the natural world. With nothing but water to fill their bellies, their senses become more acute. Emotional states such as fear, boredom, anxiety, euphoria, and feelings kindled by memories of the past become the basis for insight and internal changes leading to personal health and vitality. Transcendent or psychedelic visions are not encouraged, although participants sometimes bring back such stories.

The threshold state is not particularly dangerous and our several thousand "clients" have endured it without a single serious accident. It is nevertheless a "perceived risk." Fasting, for example, is beneficial to the health of most people. But fasting in the wilderness engenders sensations of existential exhaustion, faint-ness, and vertigo. For many, death is perceived as looming close, even when it is, in reality, far away. The perceived sense of death, or mortality, becomes an invaluable catalyst for self-discovery and change. The entire being is affected: body, psyche, mind, and spirit.

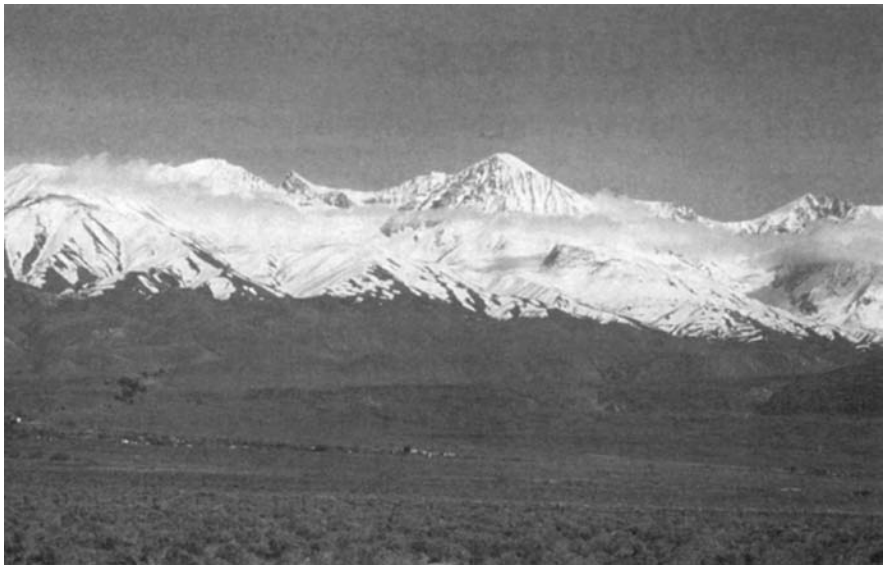
Incorporation: The third phase, incorporation, involves a process of integrating the participants with their ordinary life at a new level of self-understanding and acceptance. They are welcomed back from their threshold experience (received) with a challenge to live what they discovered. In an informal council setting (known as the School of Lost Borders), they tell their threshold stories to the others. The guides respond with comments about various elements (from practical to mythical) in each story. Intent—the reason clients chose to participate in the Vision Fast rite—is formally declared to have been attained. Participation never ends in failure, and those who return early from the fast are also helped to understand what they have learned.

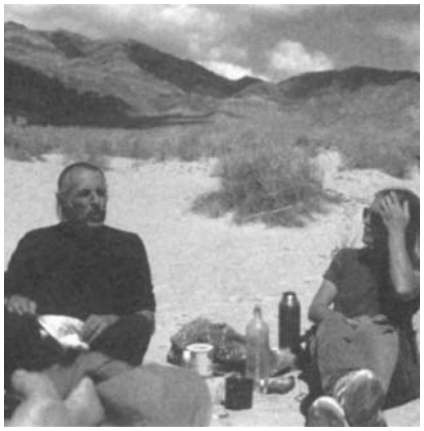
The role of the guides is not to psychologize, nor to point out weaknesses or shortcomings in the person or their story. "Person-centered listening," such as that developed by Carl Rogers, is the rule. The guides basic therapeutic task is "maieutic." That is, they assist the individual in giving birth to a new form of self-understanding. As in traditional elder councils, held when initiates in primitive times returned from their threshold passage, the councils at the School of Lost Borders seek to identify the gifts, abilities, propensities, symbols, values—the "medicine"—inherent in the clients' stories. This identification of "the gifts within the story" empowers the person to use those gifts. "Visions" (transcendent or psychedelic) are considered to be of minimal value unless tied to practical action in the world at large. For example, the vision of a new "way of being" with a spouse, friends, parents, or coworkers could be the basis for practical action, as could visions of a new career or lifestyle. Insights surrounding such issues are not uncommon in the stories brought back from the threshold experience.

## LONG-TERM THERAPEUTIC BENEFITS

Invariably, illumination occurs on a Vision Fast. People get "high." Many profess to be "reborn," "regenerated," or "revitalized." Separated from the everyday confusion of their lives by the wilderness, they are enabled to see more clearly their path ahead. But the "high" is short-lived. They have to return to the context of their lives, the routines, the work, the day by day demands of environment and peers. Sooner or later they fall into a predictable depression. The depression is essential, for without it the experience cannot be truly integrated into the ongoing saga of their lives.

Despite the fact that people generally return to a culture that does not value or understand wilderness passage rites, they rarely completely forget their experience, but hold on to it, sometimes like a shipwrecked sailor clutching a piece of the mast. Even twenty years later many are likely to say such things as, "This was the most important experience of my life." Only recently we learned that when one of our early students had succumbed to cancer, an arrow point he had found during his Vision Fast was clutched tightly in his hand.





Big Pine California, in the Owens Valley, east of the Sierra Nevada Range and west of desert wilderness in Death Valley. This is where Steven Foster and his wife, Meredith Little, train wilderness Vision Fast leaders at the School of Lost Borders.

An inescapable long-term benefit of the wilderness Vision Fast is a lifelong love for wildlands. A young man, who at age 17 confirmed his passage to manhood in Death Valley, later became director of the National Outdoor Leadership School in Kenya. A young woman confirming her passage to womanhood in the Inyo Mountains later became a professor in bioecology. Another young man marking the attainment of manhood in the White Mountains became an environmental botanist absorbed in the reclamation of military bombing ranges. Many others come to mind: the real estate salesman who joined the Nature Conservancy; the college student who became a forest ranger; the television director who decided to produce nature films; the housewife who became a bird watcher; the carpenter who became an ecologist; the teenage boy on probation who became an expert in Stone Age technology; the Disney executive who became a Vision Fast guide; the woman who spent her inheritance on a project releasing captive dolphins to the wild. The list goes on and on among the clients we have guided and expands among the clients of guides we have trained.

There are also other long-term benefits: positive shifts in self-esteem, self-control, self-reliance, and personal values. Participants tend to harbor more constructive attitudes about past crises than they had before. "Victims" crawled out of the swamps of helplessness and began the arduous trek to the sacred mountains of resolution. Decisions are made and courses of action are taken that forever alter lives. There are changes in priorities, spouses, and jobs, changes in housing, relocations of residence, new vocations and avocations, creative retirements. Some end the vicious cycle of addiction. Some sustain a renewal of their faith in matters spiritual, declaring that their experience had taught them something about dying.

## THE FUTURE OF WILDERNESS PASSAGE RITES

The future of the Vision Fast and other wilderness passage rites appears secure. After all, this dynamic has been around for at least a hundred thousand years. Today there are a thousand Raccoons who conduct Mouse down to the Sacred River. Each year we train 50–75 of them at the School of Lost Borders, and there are scores of other training programs and apprenticeships throughout the world. The number of Raccoons are growing and adapting well to the back alleys of modern civilization. But their work is not yet fully accepted by Establishment intellectuals and turf-conscious professionals. This might be expected. In ancient times such passage rites were for the benefit of all the people, even little Jumping Mouse, but the intelligentsia were the ones who told the person that if they heard a roaring in their ears, they must be crazy.

Thus, the effectiveness of the rites are diminished by the absence of universal cultural sanction. Graduates of experiences like the wilderness Vision Fast will continue to return to social contexts that do not make allowances for their self-perceived, new life status. Peers, colleagues, even loved ones may not understand or even appreciate any personal discoveries or changes that have occurred.

Ecologically, wilderness passage rites are a "soft" use of the wilderness, even though the personal experience can be hard. The solo experience leaves virtually no trace after a year's rain. They can be conducted in various kinds of terrain, from pure wilderness to multiple-use public or private lands. Of all the forms of wilderness therapy and outdoor adventure, Vision Fast rites most directly stimulate the full range of complexes within the human psyche. The three-phase dynamic (severence, threshold, and incorporation) and the three taboos (food, companionship, and shelter) potently convey the participant to what Thomas Moore calls "the soul of nature."

*They rarely forget their experience. ... Only recently we learned that when one of our early students had succumbed to cancer, an arrow point he had found during his Vision Fast was clutched tightly in his hand.*

In the regions of the human psyche are found the inward tools of change, adaptability, survival, and growth. These regions have names like self-consciousness, feeling (as opposed to reactive emotion), reflection, conscience, anima, animus, dreams, personal and ancestral memory, and shadow. They compose the mortal darkness from which the light of insight and self-discovery spring. They compose what we frail humans can know of the soul of nature and are the foundations of maturity and species survival. One psychotherapist we know estimated that a wilderness Vision Fast was worth a year of psychotherapy. How can we resist such a challenge? Humans will always be drawn to the source of the roaring in their ears. **IJW**

**STEVEN FOSTER,** PH.D., is codirector of the School of Lost Borders, P.O. Box 55, Big Pine, CA 93513, USA.

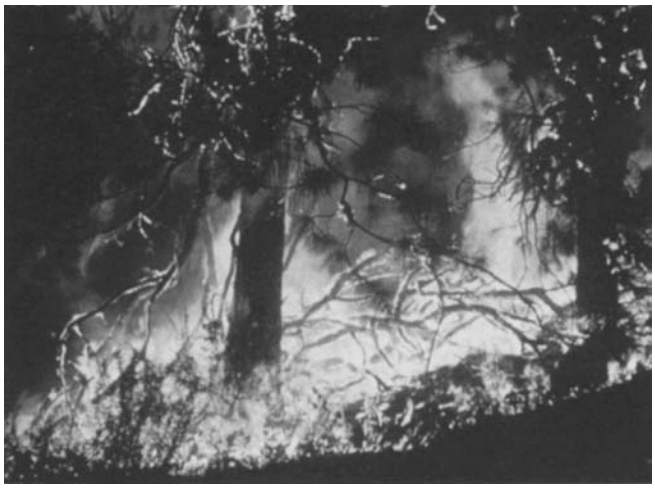
FOOTNOTES

1. See A. van Gennep, The Rites of Passage. See also J. Henderson, Threshholds of Initiation. L. Mahdi, S. Foster, and M. Little, Betwixt and Between: Patterns of Masculine and Feminine Initiation.

2. See Hyemeyohsts Storm, Seven Arrows for an excellent version of the Jumping Mouse story. See also S. Foster and M. Little, "The Roaring of the Sacred River."

# Fire and Wilderness

BY NORMAN L. CHRISTENSEN



*In the absence of fire within a normal range of incidence and severity, even wilderness ecosystems become unnatural. To restore fire to historical levels will require that wilderness managers use planned ignitions. To compensate for 80 years of fire control, and the absence of ignitions by aboriginals, wilderness managers must seriously consider using planned ignitions.*

OVER A CENTURY AGO, we began to designate, protect, and manage wilderness preserves with a confidence, even arrogance, that belied our true understanding of the task. Although not explicit in any management protocols, management of wilderness preserves a century ago was clearly seen as operationally equivalent to museum curation on a grand scale. In the words of the 1963 Leopold Committee Report (Leopold et al. 1963), we were "preserving vignettes of primitive America." If the goals were clear, the means by which we should achieve those goals seemed equally obvious; the mere setting aside of such wilderness areas seemed sufficient.

When the borders of most of our largest parks and preserves were established and fixed, the North American wilderness was envisioned as a vast array of climax communities, the distribution, structure, and function of which were determined primarily by climate. *Determined* is a key word here. Ecosystem recovery from disturbance was viewed as deterministic, following an inexorable and inevitable path to climatic climax. The critical biodiversity of landscapes was, therefore, reckoned to be contained in their array of climax communities.

Disturbances such as fire were viewed as negative, preventing ecosystems from attaining or maintaining their climax state. In his essay on "Ecology in the Public Service," Frederick E. Clements (1935), one of the architects of National Park Service policy, argued that fire was not a natural phenomenon in the "great climaxes of North America." Furthermore, his emphasis on the role of dominant species in shaping climax communities provided a scientific basis for management that focused on the behavior and welfare of the most abundant and charismatic species.

A century ago, the challenge of maintaining "tree museums" seemed a simple matter of delineating preserve boundaries and keeping disturbance, especially fire, out. Issues of spatial scale, landscape pattern, and ecosystem process were only dimly, if at all, understood. All of this seemed consistent with depictions of wilderness parks as "pleasuring places" and their dedication for "the benefit and enjoyment of the people," as termed in the 1916 Organic Act that established the National Park Service. If the potential paradoxes of "natural wonder conservation" and "people benefit and enjoyment" occurred to anyone, no one seemed especially concerned.

In the case of our public lands, our ignorance of humans' role in the development of wilderness and of their capacity to alter that wilderness in subtle and not so subtle ways, permitted us to institutionalize profound conflicts between wilderness ecosystem management and, in the words of the 1916 National Park Service Organic Act, the "enjoyment of the people." With undeserved certainty about our understanding of these ecosystems and the task of maintaining them, preserves were established and management protocols were developed with no explicit provision for the acquisition of new knowledge about the functioning of these ecosystems. Certainly there was no mechanism for the systematic incorporation of new understanding into wilderness management protocols.

Nowhere have the impacts of the limits of our understanding of wilderness ecosystems come back to haunt us with greater vengeance than with regard to the role of wildland fire. Indeed, fire management serves as a paradigm for the most daunting issues in wilderness management. Fire management during the first half of this century was focused on prevention and suppression, and operationally expressed in the so-called "10 A.M. policy": Any fire started on one day should be out be 10 A.M. of the next day (Pyne 1982).

## EMERGING EVIDENCE OF FIRE IN ECOSYSTEMS

By the late 1950s, a vast body of evidence contradictory to Frederick Clements' view of succession to climatic climax had accumulated. Tree ring fire scars dating back hundreds, even thousands, of years reveal that fires were recurring regularly in many ecosystems prior to European colonization (Swetnam et al. 1993). Indeed, studies of lake sediments have extended fire chronologies back tens of thousands of years and demonstrated a clear connection between climate change and naturally occurring wild fires. In some cases, these fires were clearly connected to the activities of Native Americans; however, in other situations, they were the consequence of lightning.

Early in this century, ecologists discovered that many plant species were adapted to fire. Thick, nonflammable bark in many conifer species imparts resistance to fire damage, and below-ground burls and protected epicormic buds facilitate rapid recovery following fire. However, in other cases, adaptations not only provide resistance to the negative effects of fire but actually result in species' dependence on fire for successful reproduction. Such adaptations include the serotinous cones of many pine species, heat stimulated germination in many chaparral shrub species, and fire-stimulated flowering in many prairie and savanna species (Keeley 1981).

In addition to its direct importance to many species, ecologists discovered that fire plays an integral role in the functioning of many ecosystems. For example, fire greatly influences the cycling of nutrients, often increasing nutrient availability to immediate post-fire pioneer species. In regions where climate or nutrient availability limits the decay of woody debris, fire is a major agent of organic decomposition. Indeed, in such situations, fire may be viewed as virtually inevitable, with the rate and pattern of fuel accumulation regulating the frequency and behavior of wildland fire. Thus, contrary to the conventional wisdom of the early part of this century when many of our largest wilderness preserves were established, succession does not necessarily lead inexorably to increased stability.

The historic lack of understanding the role of fire in wilderness ecosystems, coupled with reactions to such devastating fire events as the 1910 fires in northern Idaho and western Montana and the Tillamook Fires in Oregon during the 1930s, led to management strategies focused on fire prevention and suppression. In many cases, such strategies resulted in dramatic changes in ecosystem structure and function. For example, in the sequoia-mixed conifer

**(Peer Reviewed)**

forests of the central Sierra Nevada, a century of fire suppression resulted in diminished reproduction of the giant sequoia, and increased invasion of shade tolerant species such as white fir and incense cedar. By suppressing or preventing fires, flammable fuels had accumulated on many landscapes to levels considered by some to be outside the range of "natural" (Harvey et al. 1980).

In the late 1960s and early 1970s, recognizing the importance of fire in wilderness ecosystems, the National Park Service and the U.S. Forest Service began programs to "restore fire to its natural role." Although an unfortunate misnomer, such programs were often characterized as "let burn" programs. In reality, two classes of fire management were initiated. Planned ignition fires were systematically set within predetermined boundaries, and natural ignition fires took advantage of lightning-ignited fires burning within predetermined prescriptions. A key point is that both kinds of fire were "prescribed," that is, allowed to burn only so long as the weather, fire intensity, and fire size remained within preset parameters.

## WHAT HAVE WE LEARNED?

### 1. Change is Constant

In the words of Henry Chandler Cowles (1899),"succession is a variable converging on a variable." Climate change has been constant and has resulted in constantly changing patterns of ecosystem disturbance and recovery. Wilderness landscapes have never looked the same twice. Thus, we should not study past patterns in the hopes of recreating them, but rather to help us understand how change will determine the patterns of the future.

### 2. Change is Complex

Patterns of change are neither perfectly cyclic nor linear. Rather successional transitions are often complex and patterns of disturbance and recovery are often greatly affected by chance events. The steady accumulation of fuel during succession may result in a predictable increase in the likelihood of fire, but the exact timing and behavior of individual fires is far less predictable owing to variations in climate, weather, and human behavior (Christensen 1991). Furthermore, the unique patterns of climate that follow any particular fire will likely result in patterns of ecosystem development that are quite different from successional changes occurring at other times.

### 3. Human Impacts Have Been Around for Some Time and Are Now Ubiquitous

Human interventions in fire regimes and patterns of ecosystem recovery have long historic precedent and are today ubiquitous and inevitable. The romantic vision of wilderness as "nature free of human intervention" has about as much meaning to managers as the concepts of the frictionless plane and the ideal gas have to physicists. Although the details are poorly understood, no one doubts that *Homo sapiens* has significantly altered disturbance regimes and wilderness ecosystems over evolutionary time scales. Across much of North America, Native Americans increased fire frequency by supplementing ignition sources. These changes altered fire behavior and patterns of post-fire ecosystem development. It is important to note that the specific patterns of fire use by aboriginal peoples varied considerably through time and from place to place. Furthermore, these variations were very likely influenced by changes in climate and cultural traditions.

Nowadays, direct and indirect human impacts on fire frequency and behavior are obvious. In urban areas humans have provided increased sources of ignition resulting in increased fire frequency. On the other hand, active fire suppression has led to fuel accumulation and resulted in fewer but higher intensity fires (e.g., Minnich 1988). Because of the dissection and fragmentation of landscapes, there are few places on the earth where fire behavior has not been altered.

The inevitability and ubiquity of human intervention are abundantly clear with regard to impacts on our atmosphere. Increasing atmospheric carbon dioxide may result in climatic changes that could influence fire regimes over very large areas. On a more local scale, urban impacts on air quality influence patterns of tree growth and survival affecting patterns and accumulation of fuels. The results are altered fire behavior and patterns of ecosystem recovery.

### 4. Patterns of Disturbance and Recovery Are Uncertain

The considerable uncertainty associated with determinants of fire behavior and patterns of ecosystem recovery arises from two sources. The first is ignorance; if we only knew more we would be able to make more precise predictions about fire behavior and post-fire response. However, the second source of our uncertainty is a direct consequence of the nonlinear relationships among processes that regulate fire behavior and ecosystem change. The complex, chaotic character of fire regimes suggests that there are very real limits to our ability to predict specific behaviors and outcomes. Thus, there will likely always be limits to the precision of our predictions and inevitable surprises regarding fire occurrence and behavior. While managers should strive to improve our knowledge base, management policies and protocols will not eliminate untoward surprises.

## IMPLICATIONS FOR POLICY

When they were first initiated, the overall goals of fire management in wilderness areas seemed relatively simple (i.e., "to restore fire to a more natural role") (National Park Service 1978). But, what is natural? The Fire Management Policy Review Team (1988) defined natural as "those dynamic processes and components which would likely exist today and go on functioning, if technological humankind had not altered them." Putting aside the implication that Native Americans lacked technology, this statement seems to suggest that if natural processes are simply allowed to operate, ecosystems will converge to some preferred state. The details are far from clear, but we understand that landscape change is more chaotic than convergent.

…no one doubts that *Homo sapiens* has significantly altered disturbance regimes and wilderness ecosystems over evolutionary time scales.

Specification of objectives requires a clear understanding of the specific elements for which a preserve was dedicated. These may include historical features, species preservation, or preservation of entire wilderness areas. With regard to specific objects or species populations, policy objectives will likely be clear. However, a great deal of confusion exists over what constitutes wilderness.

*Wilderness* is usually defined in contrast to human-altered landscapes, where wilderness represents the lack of human intervention. Given this definition, the phrase "wilderness management" should be considered an oxymoron (Christensen 1995). However, pervasive human influence, from the dissection and fragmentation of landscapes, to fire suppression, to global climate change, may create conditions in which the most potent form of human intervention is doing nothing. With regard to fire, we cannot simply set aside supposedly wildlands and expect that in the absence of management "those dynamic processes and components" will go on functioning as if "technological humankind had not altered them." There is no neutral ground to which we can retreat; we have created a world in which we are obliged to manage. Given that situation we are also then obliged to formulate policy based on operational definitions of what we mean by *wilderness.* In particular we need to be explicit about what we mean by such statements as ecosystem processes, biodiversity, and heterogeneity.

Policy makers must understand the potential constraints on management in wilderness preserves. Within the realm of "natural" a wide variety of landscape configurations is possible. However, within the constraints of preserve design, not all these configurations are equally desirable. In the world of Dr. Pangloss, preserve borders would coincide with natural divides or boundaries that limit

*A strategy of early initial fire attack, even in wilderness, has been implemented using smokejumpers dispated from strategic centers around the West (right). The battle to control wildfires is hot, dirty, and dangerous work for thousands of physically fit young people. The evolving notion that fire must play its natural role in wilderness ecosystems may not be well received by persons who have been trained to combat all fire, everywhere (above).*

ecological processes such as fire. In reality, we have chosen to preserve relatively little of the once vast expanses of wilderness, and the borders of most preserves are rarely congruent with the natural processes such as fire that are necessary for their preservation. In the world we have created, the acceptability of fire events of particular intensities or spatial extents cannot be based solely on whether they are "natural" (defined as having presettlement precedent). Given the constraints of preserve design, many natural events may now be deemed unacceptable or at least undesirable. This is particularly true where we can only preserve small fragments of formerly large landscapes. In these situations, it is important to understand the ecological costs for not allowing large scale or high intensity events to occur.

In many cases, policy makers are faced with competing, conflicting, or ambiguous preserve objectives. For example, the Organic Act of 1916 extols managers to "conserve the scenery in natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations. ..." It does not take a lawyer to detect the multitude of ambiguities and possible interpretations in this statement. For that matter, the 1963 Leopold Committee's assertion that the proper goal of national park conservation is the preservation of a "vignette of primitive America" is open to various interpretations. Some would view it as a mandate for the so-called "living museum" approach to park management (e.g., Bonnicksen 1987), where the goal is to preserve vignettes of the past. Alternatively, the term vignette can be defined in a more dynamic fashion to include the process orientation of current National Park Service policy.

The constraints on wildland management posed by liability to other public and private resources are considerable. This is particularly true in wilderness preserves and parks whose goals include recreation or watershed management, and in situations where arbitrary borders separate wilderness preserve from land dedicated to nonwilderness function (e.g., the western boundary of Yellowstone National Park).

The constraints on conservation of wilderness in an increasingly urbanized context are epitomized with regard to issues such as air quality and smoke management. For example, burning in Sequoia National Park contributes particulates and hydrocarbons to the atmosphere of California's Central Valley and Owens Valley. However natural (in the sense that it has happened for millennia) that impact may be, it may be deemed unacceptable by air quality authorities when added to the host of anthropogenic emissions that now pollute our air.

Perhaps the most significant constraint on policy development is ignorance. Stewards of wilderness cannot claim nor does the public have a right to expect, perfect knowledge. The only fair expectation is good faith. Policy makers and the public must understand the limits of our understanding. Spike Lee's admonition, "do the right thing!" is attractive rhetoric, but we should never forget that in all things we can only do what we think is the right thing. Our knowledge base is necessarily provisional and incomplete and, just because you think a policy or practice is right does not guarantee its correctness.

Fire policies must acknowledge the variability and complexity of the process and its context. They must also acknowledge the limits of our ability to manage. We are learning that variability is an essential component of fire regimes and that policies should not necessarily seek to replicate mean values of intensity or return time, for example. Furthermore, policy options and goals will vary considerably across the spectrum of fire regimes. Because we can prescribe low-intensity fires such as in grasslands with high scientific precision, we have similar expectations for high-intensity events such as in shrubland or closed canopy forest fuels. However, in reality our management options in these latter situations may be more akin to those for large-scale disturbances such as hurricanes and volcanic eruptions.

Finally, policies must be developed against a backdrop of constant change and the reality that human impacts are inextricably embedded in such change. Thus, notions of "natural" may be pedagogically useful and may serve as ideal goals, but the question of what truly is natural is moot.

## IMPLICATIONS FOR MANAGEMENT PRACTICES

Management involves the development of interventions to achieve specific policy objectives. Recognizing our considerable uncertainty and ignorance about the processes we must manage, management should be considered a direct application of the scientific method. Its success depends not only on a clear understanding of available options (hypotheses), but also on a monitoring system that provides direct feedback to managers regarding management consequences (experiments and tests). Fire management options include complete suppression, planned ignition prescriptions, an array of natural ignition prescriptions, and a range of fire surrogates such as brushing, mowing, and silviculture.

Where complete fire suppression is necessary, guidelines for managing suppression impacts are critical. Such impacts include the use of fire retardants, plow lines, and heavy equipment. Where fires cannot be allowed to burn, managers may need to consider surrogates for burning, such as mechanical field manipulation and artificial cutting. Regrettably, little is known about the comparative ecological effects of such surrogates on fuels, ecosystem processes, or the biota compared to wild or prescribed fire.

Management using planned-ignition prescriptions must differentiate between the means and the ends. Most prescribed burning protocols have historically been in the context of silvicultural management where the end goals are fuel reduction and discouragement of competitors (i.e., reduced species diversity). Management goals in wilderness areas will likely be quite different and require different burning protocols. In developing burn plans it is important to distinguish between fires set to restore fuel conditions to some "natural" state as opposed to fires set to simulate a "natural" process. In the former situation, uniform fire behavior may be desirable, whereas in the latter, heterogeneity and variability may be critical.

Natural-ignition prescribed programs allow fires set by natural causes to burn so long as they are within prescribed guidelines. In a sense,

such fire management programs substitute knowledge for intervention (Christensen et al. 1989). They assume that threshold levels of fire behavior can be established beyond which fires can and should be suppressed. Serious questions remain as to whether such fire programs are realistic and natural. For example, such plans may deny important, albeit intense fire events from landscapes. In addition, given the extent of landscape fragmentation and alteration, it is unlikely that fire regimes developed in this manner will simulate the full range of natural processes that would have occurred on pristine landscapes.

Fire management plans for some larger parks and wilderness areas have included large, high intensity stand replacing fires, however, the full range of fire behavior in small wilderness areas is not possible because of the risk of escape. Over 70% of U.S. Forest Service wilderness areas in the West are smaller than 100,000 acres, and too small to permit natural prescribed fire programs.

Only in the largest wilderness areas can fire prescriptions be sufficiently broad as to include the full range of natural fire intensities and behaviors. Even then, fuel accumulation resulting from past suppression may first require "restoration" burns. Wildfires that burn out of prescription will occur and fire management plans must have clear guidelines with respect to specific post disturbance interventions. One might argue that such interventions following fires in wilderness that burn within the historic range of natural variation should be unnecessary. Nevertheless, pressures for postfire mitigation are often strong where fires in a small wilderness may have effects on adjacent lands. Guidelines for such postfire mitigation must be explicit about the wisdom and need for such measures as erosion mitigation, reforestation, and wildlife management interventions. Such postfire interventions should be judged with regard to the benefits of the intervention relative to their environmental and monetary costs, and an evaluation of the likelihood of their success.

Management should be adaptive. Any reasonable management system must have a built-in program for evaluation that provides a means of knowing whether management is accomplishing policy goals. Such a monitoring program should be viewed as a set of research hypotheses especially designed to test whether management is having the desired consequences with respect to specific dependent variables such as fire heterogeneity, decomposition and nutrient cycling, and landscape heterogeneity. Such monitoring programs not only provide inputs for adjustment to management protocols, but also serve to inform basic scientific research programs (Holling 1978, 1993; Lee 1993; Christensen et al. 1995).

Finally, it is clear that there is much that we do not know about the role of fire in wilderness ecosystems. I feel three areas deserve special research attention.

**1. Variability**

There is much that we have to learn about the causes and consequences of variability in fire regimes. For example, the Yellowstone fires taught us that models of fire behavior are not easily transferred among ecosystems (Schullery 1989). Even within a landscape, interactions between climate and fuels may result in multiple thresholds of fire behavior (Turner et al. 1994). The consequences of variation in such behavior are also poorly known. Fire often results in a pulse of resources which, although ephemeral, may greatly influence patterns of species establishment. The variability in such pulses may have much to do with the biodiversity of landscapes throughout the fire cycle.

**2. Pattern and Scale**

Although we know that variation in spatial and temporal scale of fire events may greatly affect patterns of species response, the specifics of such patterns and their mechanisms are poorly understood. Implicit in much of wilderness fire management is the notion that many small events may be substituted for a single large event, but in most cases this assertion has not been tested.

**3. Comparative Impacts of Surrogates**

We must acknowledge that prescribed fires, whether by artificial or natural ignition, are surrogates for the "real thing." They differ in intensity, variability, spatial extent and duration, and these differences undoubtedly result in very different responses in ecosystem processes and patterns of species establishment and growth. For example, are there ecological costs associated with the exclusion of high intensity fire events from certain parts of the landscape (Stephenson et al. 1991)? Substitution of nonfire management practices such as cutting and mowing may reduce fuel cover, but is unlikely to simulate other important fire effects.

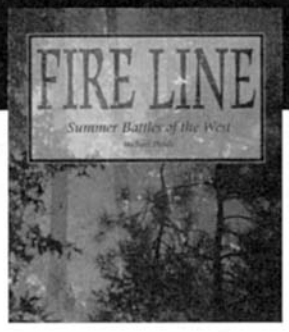
## CONCLUSIONS

Over the years, managers of our wilderness parks have moved from a so-called "object" orientation, focused on the preservation of particular historic states or putative climax communities, to a "process" orientation that emphasizes the importance of natural processes, such as fire in the maintenance of ecosystem function and preservation of biological diversity. When this transition first began, it seemed the appropriate goal was clearly restoration of these natural processes to the landscape. We have since learned that natural disturbances such as fire vary enormously and that variation is also important to ecosystem function. The enormity and ubiquity of human influences raise serious doubts about our ability to reintroduce such natural processes on the scales and at the intensities that occurred historically.

In recognizing that fire is critical to sustained ecosystem function, it is also important to acknowledge that fire cannot itself be the goal or endpoint of management. Rather, we must identify and set objectives for the key ecosystem elements and processes for which fire is important and understand how variations in fire behavior or proposed surrogates for wildland fire such as prescribed burning or mechanical treatments affect those processes. As suggested by Christensen et al. (1989), we have not established wilderness in order to burn it, rather we suppress fires, set fires, or allow fires to burn in order to preserve key ecosystem func-tions. We have much to do to understand these connections and integrate them into our management and monitoring goals. **IJW**

**NORMAN L. CHRISTENSEN** is Dean of the School of the Environment at Duke University, P.O. Box 90328, Durham, NC 27708, USA.

**Fire Line**
**Summer Battles of the West**




Michael Thoele

"... the most exciting, informative and timely book about forest firefighting available. ... you will break into a sweat reading about what a harrowing experience life on the lines can be."
—*Jason Greenlee, Executive Director*
*International Association of Wildland Fire*

No book captures the powerful natural force of fire like *Fire Line*. Each chapter begins with a first-hand account of a fierce fire battle, drawing readers deep into the heart of the subculture of more than 50,000 wildland firefighters. *Fire Line* not only recounts the history of fire in the West, but is also a story about modern day courage and bravery.

ISBN 1-55591-217-6, 20 b/w and 60 full-color photographs, 160p., hardcover, $34.95

Fulcrum Publishing • Golden, Colorado • (800) 992-2908

## REFERENCES


Bonnicksen. 1985. Restoring naturalness to national parks. *Environmental Management* 9: 479–489.

Christensen, N. L., J. K. Agee, P. F. Brussard, J. Huges, D. H. Knight, G. W. Minshall, J. M. Peek, S. J. Pyne, F. J. Swanson, J. W. Thomas, S. Wells, S. E. Williams, and H. A. Wright. 1989. Interpreting the Yellowstone Fires. *BioScience* 39: 677–685.

Christensen, N. L. 1991. Wilderness and high intesity fire: how much is enough? In *Proc. of the Tall Timbers Ecology Conference* 17:19–24.

Christensen, N. L. 1995. Plants in dynamic environments: is "wilderness management" an oxymoron? In P. Schullery and J. Varley. *Plants and the Environment*. U.S. Department of the Interior, National Park Service. Washington, D.C.: U.S. Government Printing Office.

Christensen, N. L., A. Bartuska, J. H. Brown, S. Carpenter, C. D'Antonio, R. Francis, J. F. Franklin, J. A. MacMahon, R. F. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. G. Woodmansee. (In press). 1995. The scientific basis for ecosystem management. *Ecological Applications.*

Clements, F. E. 1935. Experimental ecology in the public service. *Ecology* 16: 342–363.

Cowles, H. C. 1899. The ecological relations of the vegetation of the sand dunes of Lake Michigan. *Botanical Gazette* 27: 214–216.

Fire Management Policy Team. 1988. Report on fire management policy. USDA and USDI. Washington, D.C.: U.S. Government Printing Office.

Harvey, H. T., H. S. Shellhammer, and R. E. Stecker. 1980. *Giant Sequoia Ecology: Fire and Reproduction*. USDI National Park Service Scientific Monograph no. 12. Washington, D.C.: U.S. Government Printing Office.

Holling, C. S. 1978. *Adaptive Environmental Assessment and Management*. New York: John Wiley & Sons.

Holling, C. S. 1993. Investing in research for sustainability. *Ecological Applications* 3: 552–555.

Keeley, J. E. 1981. Reproductive cycles and fire regimes. In H. A. Mooney, T. M. Bonnickson, N. L. Christensen, J. E. Lotan, and W. A. Reiners, eds. *Fire Regimes and Ecosystem Properties.* USDA Forest Service. Washington, D.C.: U.S. Government Printing Office.

Lee, K. N. 1993. *Compass and Gyroscope: Integrating Science and Politics for the Environment*. Washington, DC: Island Press.

Leopold, A. S., S. A. Cain, C. M. Cottam, J. N. Gabrielson, and T. L. Kimball. 1963. Wildlife management in the national parks. *American Forests* 69: 32–35, 61–63.

Minnich, R. A. 1988. Chaparral fire history in San Diego County and adjacent northern Baja, Calif: an evaluation of natural fire regimes and the effects of suppression management. In *The California Chaparral: Paradigms Rexamined*. S. C. Keeley, ed. Los Angeles, Calif: Natural History Museum of Los Angeles County. Pyne, S. J. 1982. *Fire in America*. Princeton, N.J.: Princeton Unversity Press.

Schullery, P. 1989. The fires and fire policy. *BioScience* 39: 686–694.

Stephenson, N. L., D. J. Parsons, and T. W. Swetnam. 1991. Restoring natural fire to the sequoia-mixed conifer forest: should intense fire play a role? In *Proc. of the Tall Timbers Fire Ecology Conference* 17: 321–338.

Swetnam, T. W. 1993. Fire history and climate change in giant sequoia groves. *Science* 262: 885–889.

Turner, M. G., W. H. Romme, R. H. Gardner, R. V. O'Neill, and T. K. Kratz. (In press). 1994. A revised concept of landscape equilibrium: disturbance and stability on scaled landscapes. *Landscape Ecology* 8: 213–227.

USDI National Park Service. 1978. *Fire Management Guidelines.* NPS 18. Washington, D.C.: U.S. Government Printing Office.


> The principal strength of wilderness is that it is impartial to short-term benefit or to imbalanced or egocentric thinking. The wisdom in wilderness is long-term and evolutionary. Therefore increasingly in the minds of people, especially those who are concerned with a balanced future for themselves and their children, wilderness has become a symbol of environmental quality. I have personally led a thousand people of many races, nations and creeds on the trails in the Umfolozi game reserve and Lake St Lucia with the Wilderness Leadership School. These wilderness participants have a deep personal experience which affects the way in which they make decisions and view their future. There are many who echo the same phrase: "This experience changed my life."
>
> —Ian Player, 1984

# THE WILDERNESS OF FINLAND

**Editor's note:** In 1991, Finland became the most recent nation to adopt legislation that recognizes and protects wilderness areas. It is the first Scandinavian country to do so, and its Wilderness Act is also a conscious effort to incorporate traditional use of natural resources into a wilderness management regime. Interestingly, the Finnish Wilderness Act also recognizes sustainable forestry and other multiple-uses as potential management components in their wilderness system. Most Finnish managers and researchers involved in the Wilderness Act regard this as "contrary" to a wilderness ethic, and they are trying to solve this policy puzzle by clarifying, through zoning, the types of activities that can occur in each specific wilderness area or buffer zone.

Following are summaries of three papers given at the symposium *International Wilderness Allocation, Management and Research* at the 5th World Wilderness Congress (1993), in Tromso, Norway. (Proceedings are available from The WILD Foundation). They provide a glimpse into the cultural milieu in which the Finnish concept of wilderness resides, and also into their wilderness management and research.

—Vance G. Martin

# The Social Wilderness in the Minds and Culture of the Finnish People

**BY VILLE HALLIKAINEN**

THE CULTURAL ROOTS OFTHE FINNISHWILDERNESS concept lies in the source of livelihood in southern and central Finland during the Middle Ages. Traditionally, the Finnish concept of wilderness has been one of using forest-covered areas for hunting and fishing. At the end of the Middle Ages, hunting became commercialized in central and southern Finland; thus, wilderness areas were not truly wild but important economic resources.

Two different cultures influenced the formation of the Finnish wilderness concept. The hunter—gatherer aboriginal Samaii went north, while field farmers in the West and the slash-and-burn farmers in the East had established their villages. This became the new cultural framework, in which the wilderness concept found its form.

The Samaii considered the whole wilderness area their home. Until about 30 years ago, many Samaii families still lived in remote, roadless villages, especially in northern and eastern Finland, where hunting and fishing were the primary sources of livelihood. Today, the Samaii live in houses with roads connecting villages. The transition from hunter-gatherer to farmer evolved gradually. The Samaii still have a close connection to the wilderness and do not feel a sharp contrast between their homes and the wilderness that surrounds them.

To the Finnish people, the "wild" hunting areas were also important to their livelihood. A Finnish man had to prove himself a skillful hunter or fisherman to survive in the wilderness, or pick lots of berries to obtain his status. For hundreds of years, the deciduous forests of birch and conifers near their villages were appreciated by the Finnish people for their landscapes, but merely to walk in the wilderness was not understood.

In Finland, Sweden, and Norway, wilderness areas were in some ways viewed as threatening. Wild animals in the forests were a threat to grazing cattle and sometimes to people. Also, the northern climate was so cold that survival was not easy. In old southern and central European myths, the wilderness was viewed as a dangerous place, with evil spirits found in the European literature about wilderness. There were some myths in Finland that showed bears as friendly creatures, but they were treated with respect.

Spring comes to Hammastunturi Wilderness Area, Finland. Photo credit: Ville Hallikainen.

## GROWING APPRECIATION OF WILDERNESS IN FINLAND

The appreciation of Finnish wilderness started to rise at the end of the nineteenth century. With wild areas becoming symbols of power, stability, and property, national feelings about wilderness began to strengthen. At the same time, commercial forestry practices began threatening wilderness areas.

During the 1960s and 1970s, nature conservationists began to emphasize wilderness values, and new forms of wilderness recreation quickly developed. Also, conflicts emerged between the importance of timber production and the fast-diminishing area of virgin forests. This resulted in the Finnish Wilderness Act's establishment of 12 wilderness areas in northern Finland, which are currently being retained in their natural condition.

Today, wilderness areas are important to the growing ecotourism industry. The official wilderness and nature conservation areas are important for these experiences. Besides these special areas, there are also many smaller areas with certain wilderness characteristics that are used for timber harvesting and other forest management practices.

In 1990, a questionnaire was sent to 2,000 randomly selected Finnish people. Approximately 44% responded, and a sampling of people were also interviewed by telephone. Over 90% of those surveyed thought it was important to retain wilderness areas. The three most important reasons cited were: 1) to preserve endangered species, 2) to retain the areas for future generations, and 3) to conserve the areas for recreation.

The results also showed that of those surveyed, their first images of wilderness were of roadless, uninhabited areas covered mainly with virgin forests. Open peat lands and silent areas away from habitation were also mentioned. These images did not exclude professional or recreational hunting or gathering. The responses from people of different backgrounds were seemingly homogenous.

Finnish wilderness areas have traditionally been large and remote. Over half of the Finnish people who responded to the survey had visited an area they regarded as wilderness. The old traditions of hunting, fishing, and berry picking were evidently still valued, especially for those living in the countryside. For urban dwellers, modern activities like backpacking, observing nature, admiring scenery, and sitting by a camp-fire were important. These experiences, along with enjoying peace and quiet, were also valued by the traditionalists. It is interesting to note that the concept of freedom was not mentioned in the reasons given for wilderness use. It seems the Finnish are quite social in the wilderness. Maybe one explanation could be that Finnish hunters have sometimes formed small groups in their ancient hunting traditions.

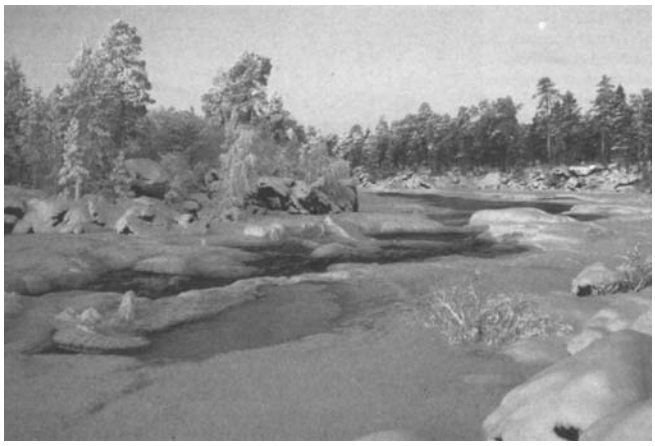
The Finnish wilderness has deep cultural roots. Today, most Finnish people live near wilderness areas. Natural landscape is important for the experience of wilderness, but the areas do not have to be unused. Recreational uses of wilderness are increasing in importance. Even light forestry operations seem widely accepted. Humans have always taken trees from wilderness areas to use in building and heating their cabins. The traditional uses of hunting and fishing are a main part of the Finnish culture. To take these practices away would take part of the culture away.

The biggest challenge lies in deciding how the cultural origins and traditional uses of wilderness can coexist with modern timber harvesting and the growing ecotourism industry. Also, the question remains: Is the idea of wilderness changing, and in what direction? **IJW**

For further information, contact **VILLE HALLIKAINEN** at the Rovaniemi Research Station, Finnish Forest Research Institute, Etelaranta 55, PL-16, 96301, Rovaniemi, Finland.

# The Finnish Wilderness Research Program

**BY ANNA-LIISA SIPPOLA, JUKKA JOKIMÄKI, VILLE HALLIKAINEN, AND PENTTI SEPPONEN**



PRISTINE NATURAL AREAS HAVE DIMINISHED drastically in northern regions during the last few decades, especially in Fennoscandian countries, where economic activities such as forestry and tourism have expanded northward. In Finland, wilderness areas have decreased significantly from the 1960s to the 1980s. These economic activities have penetrated wilderness areas causing conflicts between new activities and subsistence activities such as reindeer herding, hunting, and fishing. The plans for timber harvesting in some of the remaining wilderness areas gave rise to a strong movement among nature conservationists in the 1980s, which led to a large debate on the importance of the last wilderness areas and the need to preserve them. In 1991, the Finnish Parliament passed the Wilderness Act, which established 12 wilderness areas in Finnish Lapland.

The Arctic Centre at the University of Lapland and the Finnish Forest Research Institute launched a wilderness research program in 1991. In order to investigate future research needs and interests, the Arctic Centre organized a multi-disciplinary seminar. A list of research needs and information on existing data was compiled. The Finnish Wilderness Research Program summarized this research plan.

The research program summarized that biological and geographical data are most abundant, but the ecological impacts of environmental changes are poorly understood; information on endangered species and habitats is scattered; the history of the utilization of wilderness areas as well as their current use is not sufficiently studied; knowledge on the wilderness experience and on the social and economic significance of those areas is the least understood of all; questions regarding the right of use and problems arising from conflicts between different interest groups (e.g., reindeer herding, forestry, recreation, mining, fishing, and hunting) are among the first priorities for research and management; and most of the areas belong to the Samaii land-claim areas, where problems still remain unsolved.

The goals of the wilderness research program are these: 1) to establish a multi-disciplinary research project to obtain scientific knowledge as the basis for legislation, administration, management, and use of wilderness areas, 2) to produce a wilderness database, 3) to develop international contacts and cooperation in the wilderness contest, and 4) to increase people's general knowledge about wilderness issues.

The wilderness research program is not restricted to the defined wilderness areas, but includes all pristine areas with a wilderness character. Projects were started in the fields that seemed most important. At present, there are 19 ongoing research projects, representing five fields: 1) the sociological and ecological concept of wilderness, 2) the role of wilderness in the human context, 3) the use of wilderness, 4) ecology and management of wilderness areas, and 5) wilderness information systems. Presently, eight institutes and universities are participating in the project, which acts as an umbrella for both ongoing and new research and is coordinated by the Arctic Centre. Meetings and scientific symposia are being held on the topics which should produce several master and doctoral theses. **IJW**

For further information, contact **ANNA-LIISA SIPPOLA** at the Arctic Centre, University of Lapland, P.O. Box 122, Rovaniemi, Finland.

# Management and Planning for Wilderness Areas in Finland

**BY TAPIO TYNYS**

NORTHERN FINLAND BELONGS to the narrow circumpolar zone in eastern Fennoscandia. Here the Gulf Stream bends the vegetation zones to the north creating environments with profuse Arctic light in the summer, yet with subarctic or even mild temperatures. Mountain birch, pine, and spruce vegetation types, are all found in northern Finland. The nature of southern Finland, especially around Lake Inari, is characterized by vast pine forests, numerous lakes, and some fells. In the northern and western parts of the country, the gently sloping fells are open or the slopes are covered by mountain birch forests, and vast mires.

Of the 12 wilderness areas in Finland, ten are located in the North. The area is populated with people of Finnish, Samish, or Finnish-Samish origin, with density only 0.04 inhabitants per square kilometer. The cultures of both the nationalities are similar today. Their natural means of livelihood, especially reindeer husbandry and fishing, are important. Forestry is also important, because industry there is on a small scale. Nature tourism in the area has been increasing.

The state owns 89% of the lands and waters in northern Finland. The Northern Lapland District for Wilderness Management (NLDWM), or Forest State, as the local people call the organization, directs and manages the use of this natural resource. The organization also makes use of the land by selling timber, fishing licenses, and holding rights.

Up until the 1950s, Forest State concentrated mainly on administrative and protective tasks such as fire control; then from the 1950s to the 1980s forestry became the primary activity. Logging was the main source of income up to the 1970s for the Inari Commune. In the 1970s, the organization was criticized for its large logging areas and dense road construction, and later for logging old, virgin forests. National conservation plans were drawn up, and multiple use and nature conservation of the forests were demanded.

The organization faced conflicting objectives. The owner, the Finnish state, expected high annual incomes and a high level of nature conservation activities at the same time. In response to local, national, or international demands, the Forest State decided in 1987 to participate in all activities concerning the use and management of the northern land and waters. The status of outdoor recreation and nature conservation gradually rose to the same level (and higher) as forestry, and by 1993 a new organizational model was put into effect. Three communal communities were formed by the initiative of the NLDWM. The committees direct the organization in strategic planning and principle questions.

Also, in 1991, the Wilderness Act was approved by the Finnish Parliament. The Act moved 3.6 million acres (1.5 million hectares), of which 408,000 acres (170,000 hectares) are productive forest land, to a Wilderness Areas category. The objectives of the Wilderness Act are to maintain wilderness, secure the Samish culture, secure natural means of livelihood, and develop multiple use of wilderness and preconditions for multiple use.

The objectives of the Wilderness Act are a bit contradictory. It is almost impossible to maintain wilderness character and develop the multiple use of an area at the same time. The NLDWM tries to solve the problem by dividing it into two areas. In the core area, the maintenance of wilderness character is of highest priority. The necessary outdoor recreation services are concentrated in the border area, usually to places that already are in intensive use. Minor forestry is located in the border are as well.


Finnish wilderness reserves.

The use of northern wilderness areas is regulated by the NLDWM on the basis of individual maintenance and care plans drawn up by each area. Such plans cannot be implemented until sanctioned by the Ministry of Environment. The wilderness maintenance and care plan consists of two parts; the description of the area, and the plan. The basic description of the wilderness area is drawn up in cooperation with scientists, NLDWM officials, and local experts. The plan is based on a public participation method which includes: a public hearing, official and unofficial meetings in the wilderness, phone calls, and interviews. Finally, the draft of the plan is approved by statements from the parties concerned.

There are many maintenance and care plans under development that are to be completed in about five years. This public participation method is new in Finland, and is being used for the first time in land use allocation in the Finnish Forest and Park Service. Upon completion of the management plans for the wilderness areas, the combination of conservation and forestry areas should provide a basis for sustainable and multiple use for land and waters. This planning procedure should help implement the basic premise for the Forest and Park Service in northern Finland: to join the various kinds of uses and interests of the population. **IJW**

For further information, contact **TAPIO TYNYS** at the Northern Lapland District for Wilderness Management, Finnish Forest and Park Service, Ivalo, Finland.

# Searching for an Interdisciplinary Approach to Northern Wilderness Areas Issues—

## *Highlights of an International Wilderness Research Conference in Finland*

**BY JARKKO SAARINEN, LIISA KAJALA, VILLE HALLIKAINEN, AND ANNA-LIISA SIPPOLA**

*"Wilderness—a vast, uninhabited land, with no roads, no industrial development—an area where nature dominates. This is the image of wilderness in the minds of people, and despite the fact that the official definitions of wilderness vary in different countries, most of us intuitively attribute very similar criteria to this term. But is there real wilderness anymore, or has there ever been any wilderness? And what is the future of these areas that we call wilderness?" (Sippola 1994: vii)*

DURING THE GLOOMIEST ARCTIC DUSK, from December 7-December 9,1994, about one hundred wilderness scientists and managers from Finland, Norway, Russia, Estonia, Great Britain, Australia, and the United States joined together at the Arktikum House in the city of Rovaniemi, Finland. The purpose of the gathering was to share research findings on the ecology, human use issues, and management challenges of northern wilderness areas. Aboriginal people and their relationship to nature, the values and challenges of wilderness preservation, and biodiversity monitoring methods dominated much of the discussion. The International Conference on Northern Wilderness Areas was sponsored by the Arctic Centre and the Rovaniemi Research Station of the Finnish Forest Research Institute, two of the eight research organizations and universities participating in the Finnish Wilderness Research Program.

Wilderness research has a relatively long tradition in the United States (Lucas 1987). European and Scandinavian wilderness areas, however, have received attention only recently. These places do not have the benefit of an established wilderness research tradition. However, ecological and social research on Scandinavian wilderness areas is gaining increasing attention due to the scarcity of such areas as well as increasingly diversified social value systems (Hallikainen and Jokimaki 1992). The natural and cultural heritage of Scandinavian wilderness make accurate knowledge of these systems crucial to determining appropriate management strategies. The conference provided the opportunity for researchers and managers, representing different disciplines and research traditions, to gather in Rovaniemi to discuss issues of regional and global concern.

### BIODIVERSITY ISSUES

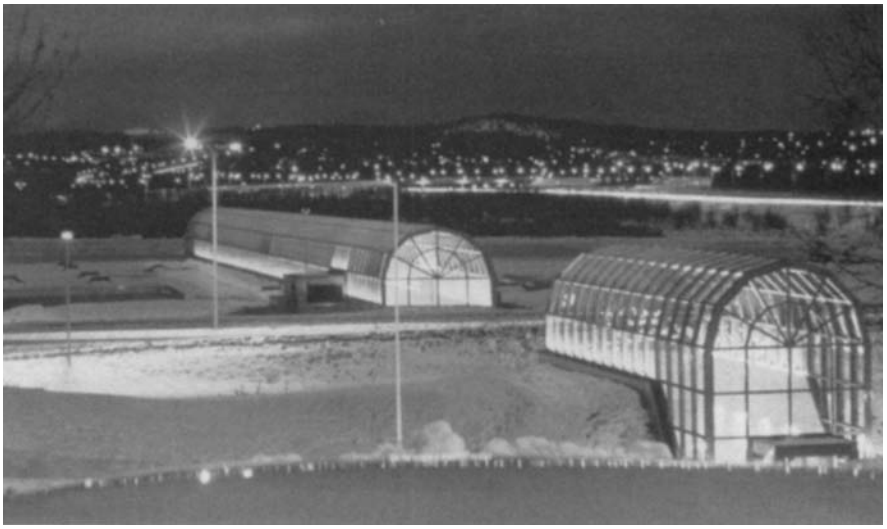
There were many ecological issues of wilderness presented at the conference. The first key note speaker, Dr. Yrjö Haila of the Satakunta Environmental Research Center at the University of Turku (Finland), presented a comparison of natural succession boreal forests to those influenced by human activities. The natural dynamics and biodiversity of intact forests have recently become central research questions in Fennoscandian ecological studies. Similarly, other presenters provided comparisons of species composition of old-growth forests and managed forests. Jukka Jokimäki of the Arctic Centre, Esa Huhta of the University of Jyvaskyla, and Jouko Inkeröinen of the University of Oulu (Finland) focussed on the influence of timber harvesting-related forest fragmentation on bird communities. The study by Anna-Liisa Sippola and Reino Kallio of the Arctic Centre (Finland) analyzed changes in beetle species composition caused by harvesting practices, particularly focusing on saproxylics and rare species. Esteri Ohenoja, University of Oulu (Finland), compared species distribution and fruit body production of fungi in intact and managed boreal forests. Common to all of these studies was the goal of producing information that could contribute to improving management decisions aimed at maintaining or enhancing biodiversity in managed forests.

*Winter night at Arctic Circle near Rovaniemi, Finland.*

In Fennoscandia it is quite difficult to study large-scale forest dynamics of pristine forests and its influence on flora and fauna communities; there are very few intact ecosystems, and even in them the natural succession has been hindered by the elimination of forest fires. In Russia, on the contrary, there still exist large continuous taiga regions where natural succession occurs. The Finnish Game and Fisheries Research Institute is conducting an extensive study on the significance of large uniform forest areas to natural animal populations. Harto Linden (Finland) presented results of one institute study that compared wildlife species of Finland and Russia. Preliminary results indicate distinctive differences between Finland and Russia in populations of several wildlife species. Ari Nikula, Finnish Forest Research Institute, and Pekka Helle, Finnish Game and Fisheries Research Institute (Finland) presented their work on GIS-based mapping and research methods for analyzing dependence of wildlife on certain wilderness attributes.

Reindeer herding is a traditional source of livelihood in Fennoscandia and Russia. The impacts of extensive reindeer grazing on naturalness of ecosystems were discussed in the presentation by Timo Helle of the Finnish Forest Research Institute and Ilpo Kojola, Finnish Game and Fisheries Research Institute (Finland). Georgy Sidorov, Russian Academy of Sciences (Russia), presented his studies on salmon of northern Russia and the influences of human activities on natural fish populations. Russian researchers have an abundance of baseline data about northern ecosystems.

This information could provide fruitful cooperation possibilities between Russian scientists and researchers from Western cultures. Several countries are cooperating in mapping wilderness areas and natural resources. Even Husby, GRID—Arendal (Norway), and David Henry, National Remote Sensing Centre (Great Britain), updated the group on the Barents Wilderness Quality Mapping Project. In this project, developed cooperatively by GRID—Arendal and several research organizations, the quality of wilderness areas in the Barents region of Russia is mapped using such criteria as degree of roadlessness, distance from human habitation, and naturalness of the areas. They also discussed the World Conservation Monitoring Center's (Great Britain) work to construct a database containing broad information on natural resources of Russia. In the future these data bases will provide valuable, comprehensive information to researchers studying northern wilderness areas.



The conference was held in the Arktikum House, Rovaniemi, Finland.

## CONFLICTS, SYMBOLIC VALUES, AND INDIGENOUS PEOPLE

Northern wilderness areas have high potential for both substantive and symbolic conflicts and power struggles. There are conflicts between indigenous people and advancing society, and between different recreational user groups. With regard to the former, the second keynote speaker, Juha Pentikainen, University of Helsinki (Finland), analyzed the concept of "northern" and its meaning from the perspective of local people. According to Pentikainen, the concept is more than just a location expressed by cartographic coordinates; northern is part of the identity of the people there, where nature, religion, and ethnicity are inseparably intertwined. Recent work on appraisals of place identity and personal meanings offers new potential for understanding how northern people value resources (see Shields 1991; Short 1991).

Tatjana Evdokimova of the Russian Academy of Sciences (Russia) reported on the conflicts between traditional branches of the economy (reindeer herding, hunting, and fishing) and new industrial branches (oil, gas, and mineral extraction). Many of the Siberian peoples have moved away from their traditional regions due to the expanding demands for natural resources by modern society. In northern Russia, the issue is not only how to preserve the existing wilderness, but also how to maintain opportunities for aboriginal lifestyles and cultures. The possibilities for maintaining culture and language has, in some places, become so hard that many small cultures are likely to become extinct within a couple of decades. These conflicts were discussed also by Natalya Gutsol and Evgeniya Patsia of the Kola Science Center (Russia) and Ilpo Soini, University of Oulu (Finland), in the context of socio-economic changes in small communities of the Kola peninsula.

Conflict between and among different wilderness user groups is currently a priority research topic in Finland. Jarkko Saarinen, Finnish Forest Research Institute (Finland), reported on findings from interviews with backpackers in Urho Kekkonen National Park that suggest specific social and cultural meanings of backcountry travel in the Finnish context. Tolerance of others' presence in the backcountry suggested less constraint on enjoyment of experiences than previously found in North American studies. Alan Watson, Aldo Leopold Wilderness Research Institute (USA), and Liisa Kajala, Finnish Forest Research Institute (Finland), focussed on contributors to interpersonal conflict by presenting results and implications of several related case studies conducted in the United States. They presented results from these recent studies that demonstrate more careful measurement of both the potential contributors to conflict, and conflict itself. Some specific conflict management techniques and principles for managing recreational, as well as broader social conflicts, were presented and discussed in another paper by Liisa Kajala of the Finnish Forest Research Institute (Finland). The interest in conflicting demands on wilderness resources is an important issue in many countries and these efforts to summarize recent research and draw conclusions about the potential for addressing problems in northern wilderness areas, suggest this topic will remain an important one.

## NORTHERN WILDERNESS CONCEPT

Within this general conference theme, presenters attempted to explore the wilderness concept as it applies to northern areas. Leena Vilkka, University of Helsinki (Finland), summarized the various ways people ascribe value to wilderness: technocentrism, anthro-pocentrism, and naturocentrism, concluding that the primary intrinsic values of wilderness are anthropocentric and three naturocentric positions. The naturocentric positions that define human values attached to wilderness include zoocentrism (stressing sentience and the ability to suffer), biocentrism (stressing the view that not only animals but all living organisms have their own well-being), and physiocentrism (stressing the well-being of the land, ecosystem, and the earth). Ville Hallikainen, Finnish Forest Research Institute (Finland), concentrated on the anthropocentric perspective, discussing the cultural, historic, and current meaning of wilderness to Finnish people. Yet a different perspective of the meaning of wilderness was introduced by Seppo Lohiniva, Finnish Forest Research Institute (Finland), who discussed confrontations between the discourses of environment and tourism. This confrontation has resulted in the concept of ecotourism, which presupposes a conscious relationship between tourism and conservation. There is obviously some international variation in recognizing the purpose or values of wilderness, but these differences also exist within many countries with varied populations.

## MANAGEMENT AND PLANNING FOR NORTHERN AREA WILDERNESS

The third session of the conference focussed on management and planning of northern wilderness areas. The need for preserving wilderness areas is urgent in Russia where natural resource utilization is continuously expanding to new, relatively intact areas in taiga and tundra. The nature preservation and planning needs of northern Russia were discussed both by the keynote speaker of the session, Peter Prokosch, World Wildlife Fund (Russia), and by Irina Pokrovskaya of the Biodiversity Conservation

Mires are considered to carry a lot of wilderness character by Finnish people. Picture from Muotkatunturi Wilderness Area, Finland. Photo credit: Ville Hallikainen.

Northern wilderness areas have high potential for both substantive and symbolic conflicts and power struggles.

Center (Russia), but the main focus of the session was on Finnish wilderness management and planning systems. Most of the presentations were case studies introducing one northern wilderness or nature conservation entity, and management guidelines for that specific area. An interesting additional perspective to this session was brought by presentations on local hunting use by Matti Mela, Finnish Forest and Park Service (Finland) and on controlling legal motorized vehicles in wilderness areas by Arvo Olli of the Finnish Forest and Park Service (Finland). These presentations linked sessions two and three together by giving very specific and current examples of wilderness user conflicts both from the perspective of local communities and from that of recreationists. The importance of public participation in conflict management was also emphasized; conflicts can be significantly reduced by involving local people in the planning process from the very beginning.

The conference was one more indication of the broad spectrum of wilderness research occurring around the world. Moreover, the formal presentations, teamed with many posters on the primary conference topics, and informal discussions, indicated that people representing different cultures and research traditions can significantly learn from each others' work. The meanings related to "wilderness" varies remarkably from one culture to another. For example, the Finnish term for wilderness (i.e., eramaa) is a culturally and historically defined term. In Finland, wilderness used to be part of people's everyday life as hunting and fishing areas, whereas in the Anglo-American culture wilderness is defined as an area outside of human activities. These differences in the basic concept of wilderness may explain many of the differences we observe in management actions being applied in the different countries with wilderness preservation systems (see Hallikainen 1994). **IJW**

*Proceedings of the conference will be published in the Arctic Centre Publication Series, and will be available from Arctic Centre at the beginning of 1996. Addresses of all participants are available from the senior author of this summary, Jarkko Saarinen.*

**JARKKO SAARINEN, LIISA KAJALA,** and **VILLE HALLIKAINEN** work for the Finnish Forest Research Institute, Rovaniemi Research Station, P.O. Box 16, FIN-96300, Rovaniemi, Finland, **ANNA-LIISA SIPPOLA** is employed at the Arctic Centre, University of Lapland, P.O. Box 122, 96101 Rovaniemi, Finland.

## REFERENCES

Hallikainen, V. 1994. The "social wilderness" in the minds and the culture of the Finnish people. In *Proc. of the International Wilderness Allocation, Management, and Research*. Tromso, Norway, September 1993. Fort Collins, Colo.: International Wilderness Leadership Foundation.

Hallikainen, V., and J. Jokimaki. 1992. *Suomen erdmaatutkimusohjelma 1993–1996*. Summary. (Finland's wilderness area research program 1993-1996.) Arctic Centre Publications, 7. University of Capland, Rovaniemi, Finland.

Lucas, R. C: 1987. Perspectives on the history of wilderness research. In *Proc. of the National Wilderness Research Conference: Issues, State-of-Knowledge, Future Directions*. USDA Forest Service General Technical Report INT-220. Washington, D.C.: U.S. Government Printing Office.

Shields, R. 1991. *Places on the margin*. London: Routledge.

Short, R. 1991. *Imagined country*. London: Routledge.

Sippola, A. 1994. *Book of Abstracts*. Presented at the International Conference on Northern Wilderness Areas: Ecology, Sustainability, Values, December 7–9. Rovaniemi, Finland.

**Wilderness needs you!**

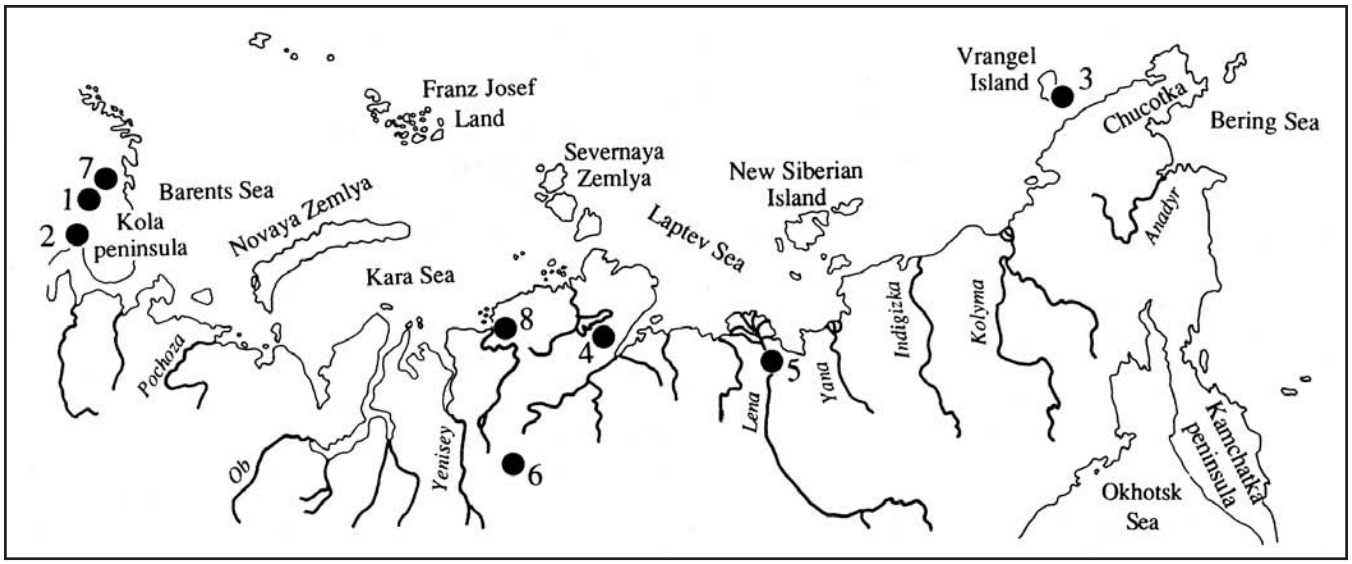
The Wilderness Act of 1964 gave us, the American people, magnificent wild places … places that inspire us, renew us, and fill us with awe. Unfortunately, we are in danger of losing these places of beauty and wonder. To find out more and to learn how you can help save our wilderness, contact Wilderness Watch, the *only* national grassroots citizen's organization dedicated to the protection and preservation of Wilderness and Wild & Scenic Rivers.

Remember … we do not want to expand Wilderness, but simply take care of our vanishing natural heritage.
For more information, contact Wilderness Watch, Box 9175, Missoula, MT 59807, USA; (406) 542-2048.

# Strict Nature Reserves in the Russian Arctic—

## *Their Aims, Present Situations, and Future Development*

**BY VICTORY. NIKIFOROV**




Strictly protected nature reserves (zapovedniki) in Russia (north of the Arctic Circle) by 1993. (See Table 2.)

WHAT IS THE RUSSIAN ARCTIC? First, it is necessary to define what we mean by the Russian Arctic or what territory it occupies. For some people the Russian Arctic means the tundra zone; others identify it as the territory north of the Arctic Circle. The Russian tundra zone covers about 473 million acres (197 million hectares). Table 1 represents the data on different categories of protected nature areas in Russian tundra zone, and in Russia as a whole. There are five strictly protected reserves (zapovedniki) in the tundra zone which occupy 18.5 million acres (7.7 million hectares), making up about 4% of the tundra zone. If one takes into account other types of protected areas as well (i.e., zakazniks and national parks), protected natural areas make up about 10% of the tundra zone. The territory to the north of the Arctic Circle occupies approximately 1,150 million acres (479 million hectares) in which there are 7 reserves with a total area of 24 million acres (9.97 million hectares) or *2%* of the territory. The area of each reserve and the year of its creation is shown in Table 2. As indicated in Table 2, the Kandalakshysky and Laplandsky strict nature reserves have existed for more than 60 years. Two reserves, Pasvik and Great Arctic, were established during the last five years. The author of this article had direct participation in their creation.

### WHAT IS A RUSSIAN ZAPOVEDNIK?

In Russia, in contrast to western countries, there are strict rules concerning nature protection. From the moment when the Russian government signs a resolution about the creation of a new, strictly controlled nature reserve (which in Russian is called zapovednik, which means "forbidden"), this territory is closed to tourists, hunting, fishing, geological expeditions, and agriculture. No one is allowed to live in or travel across this area. Only scientific work by the official permission of the zapovednik administration is possible in these areas. Along with the name zapovednik we use the term "absolutely protected areas." The Russian law for establishing the first zapovednik in Russia was signed as far back as 1916. The Barguzinsky zapovednik near Lake Baikal was created to protect the population of Sabel. Today there are 84 zapovedniki in Russia, including 77 zapovedniki under the authority of the Russian Ministry of Environment. They occupy about 60 million acres (25 million hectares) or 2% of the entire Russian territory. On October 2, 1992, Russian President Boris Yeltsin signed a special resolution about the development of a zapovednik system in Russia, which calls for Russia to have 3% of its area covered by zapovedniki by the end of the century.

*From the moment when the Russian government signs a resolution about the creation of a new, strictly controlled nature reserve, this territory is closed to tourists, hunting, fishing, geological expeditions, and agriculture. No one is allowed to live in or travel across this area.*

When creating a new national park or reserve in western countries, a lot of problems arise with farmers and private landowners. Now, we come across similar problems in Russia. It is already impossible in our country to create large zapovedniki with an absolutely protected regime. As a result, several projects in the Russian Arctic were not practical. However, by the end of 1991, the Russian government had approved a new regulation on state strict nature reserves and now, in addition to the zones with absolutely protected regime, we can plan buffer zones and biosphere reserves. For instance, the Great Arctic Reserve includes two zones: absolutely protected areas and biosphere proving grounds (52% and 48%, respectively). The former occupies 5.2 million acres (2.16 million hectares) and it is the world's largest protected area among strict nature reserves.

Table 1. Protected nature areas in Russia in 1993 (after Volkov and de Korte 1993).

| Category | All Russia n | All Russia Size ha x 1,000 | All Russia % of territory | Arctic Russia (tundra zone) n | Arctic Russia (tundra zone) Size ha x 1,000 | Arctic Russia (tundra zone) % of territory |
|---|---|---|---|---|---|---|
| Strict nature reserve (zapovednik) | 84 | 25,000 | 2.00 | 5 | 7,700 | 4.00 |
| Nature reserve (zakaznik) | 1,500 | 57,400 | 3.35 | 16 | 8,875 | 4.60 |
| National nature park (natsionalniy park) | 22 | 4,265 | .25 | 0 | 0 | 0 |
| Nature-ethnic park (prirodno-ethnichesky park) | 1 | 3,053 | 0.18 | 1 | 3,053 | 1.58 |
| Natural monument (panyatnik priridi) | 7,600 | ? | | | ? | |
| All categories (except natural monuments) | 1,607 | 90,000 | 6.0 | 22 | 19,700 | 10.20 |

Table 2. Russian reserves north of the Arctic Circle, size and year of establishment. Figures refer to Table 1.

| Reserve | Area ha x 1000 | Year of establishment |
|---|---|---|
| 1. Laplandskiy | 268.4 | 1930 |
| 2. Kandalakshskiy | 70.5 | 1932 |
| 3. Wrangel Island | 795.7 | 1976 |
| 4. Taimyrskiy | 1,348.3 | 1979 |
| 5. Ust-Lenskiy | 1,433.0 | 1985 |
| 6. Putoranskiy | 1,887.3 | 1988 |
| 7. Pasvik | 14.6 | 1992 |
| 8. Great Ardtic | 4,169.2 | 1993 |
| Total area | 9,970.0 | |

## PRESENT SITUATION

The Russian Arctic is characterized by a number of features. On the one hand, nowhere in the world north of the Arctic Circle exists such large industrial centers as Murmansk, Vorkuta, and Norilsk. On the other hand, for many years the northern areas have been closed to foreigners and Soviet people as well. In our opinion, the inaccessibility of the territory, low density of population, and the existence of military and navy units have played a positive role in the conservation of nature. As an example, a group of enterprises in Nikel is situated in immediate proximity to Pasvik reserve (on the Russian-Norwegian border) where nature is well preserved and is practically untouched. To a great extent, this is caused by the fact that the Russian part of the Pasvik reserve is probably one of the most guarded reserves in the world. Within an area of 36,000 acres (15,000 hectares) there are about 80 persons armed with Kalashnikov submachine guns. With the present complicated economic situation in Russia, income is greatly reduced, and people are leaving the north. As an example, the population of the northernmost district center, Dickson, has dropped from 5,000 to 3,000 people. Military units are closing and their staffs are being cut. The prices of helicopter flights, practically the only means of transport in the Arctic, have increased a hundred fold. The Russian Arctic is becoming depopulated. At the same time the activity of the commercial firms and structures is rapidly increasing. Many old deposits of minerals, which were discovered in the 1950s and 1960s, are running out. As a result, the search for and exploitation of new mineral deposits has begun, but under weakened control by the state.

*If we take into account the unique and vulnerable character of Arctic ecosystems, we come to the conclusion that practically the entire Russian Arctic must be placed under strict control by the state.*

## CREATION OF NEW RESERVES

If we take into account the unique and vulnerable character of Arctic ecosystems, we come to the conclusion that practically the entire Russian Arctic must be placed under strict control by the state. Reserves must be created to forestall industrial development of the lands. The most valuable areas of the Arctic, such as breeding grounds of rare and disappearing species of animals (polar bear, walrus, red-breasted goose, peregrine falcon), nesting and molting areas of birds, and spawning grounds of salmon should be preserved under the absolutely protected regime.

## LOCATING NEW RESERVES

It is possible to locate several workable projects in the near future. First is the reserve on the Novaya Zemlya Islands. In 1947–1951 there was a small reserve (10,800 acres/4,500 hectares) in Gusinaya Zemlya Peninsula of these islands, but in the period of mass reserve reorganization it was closed. The organization of the northern nuclear ground stopped all scientific research. Now according to the existing plan (Uspensky, Khakhin 1993), absolutely protected areas will be situated in the northwest part of the Yusjny Island (336,000 acres/140,000 hectares) within the main area for polar bear reproduction. The areas with less strict regimes that are planned are the following: the Gusinaya Zemlya Peninsula (480,000 acres/200,000 hectares), where one can find the main nesting and molting places of geese; Karskie Vorota, the main nesting places of barnacle goose and eiders; the Oranskiye Islands (108,000 acres/45,000 hectares) with the main breeding grounds of walrus, and bird colonies on the seashore. The total area of the future reserve is 2.6 million acres (1.1 million hectares). Now it is being coordinated with the command of the northern nuclear grounds.

The second workable project is the second stage of the Great Arctic Reserve on the Severnaya Zemlya Islands. In the south of the Bolshevik Island, commercial exploitation of gold is being carried out. It is necessary to organize the protection of the ivory gull, kittiwake and brent goose colonies and the polar bear breeding grounds. There is an opinion that it is workable to create a national park on the Severnaya Zemlya Islands.

Conservation of biosphere areas, with emphasis on their ecological, historical, and cultural value for small numbers of northern peoples and ethnic groups, became one of the main principles of protected area creation in the Russian Arctic. In July 1994, the Arctic part of the Taimyr reserve on the west coast of Taimyr (the area of this part is 1.2 million acres/0.5 million hectares) was opened with help from the Worldwide Fund for Nature. The Arctic part of the Taimyr Reserve contains land of the Dolgan people, who now number approximately 5,000 individuals. The resettlement of tundra peoples to villages after the October Revolution created many social problems because Dolgan people had never lived in villages. This land belongs to the national village Syndasko and creates very difficult living conditions. Some Dolgan people still continue to live in the tundra and engage in traditional fishing and hunting of Arctic fox. Our aim is to create a protected area with state control of inhabited places and traditional activities of native people. Of course, in this case we can not speak of an area with an absolutely protected regime. **IJW**

After graduating from the M.V. Lomonosov Moscow University in 1979 (soil-science faculty 1974–1979), **VICTOR NIKIFOROV** worked in the Institute of Evolutional Animal Morphology and Ecology (Russian Academy of Science 1979-1984) and later in the Main Hunting Directorate (1984–1990). He was a project leader, organizing the Russian part of the Russian—Norwegian reserve Pasvik (1991–1992) and the Great Arctic Reserve in Taimyr (1992—1994). At present he works as Deputy Director of the Great Arctic Reserve.

*This paper was presented in Strategies for Protecting Arctic Wilderness at the 5th World Wilderness Congress, Tromso, Norway, 1993. To order contact the Direktoratet for Naturforvaltning, Tungaslettaa 2, N-7005 Trondheim, Norway, Tlf: (+47) 73 58 05 00;* Fax: (+47) 73 91 54 33.

REFERENCES (cont'd from page 42)

Uspensky, S., and G. Khakhin. 1993. *The system of the strict nature protected areas in the Novaya Zemlya Archipelago.* In press.

Volkov, A., and J. de Korte. 1993. *Nature Reserves in the Russian Arctic.* In press.

# *Open Letter to President Boris Yeltsin*

Dear President Boris Yeltsin:

We, managers of the federal Zapovedniki (Nature Reserves) and National Parks of Russia, turn to you with great alarm about the fate of our national system of Zapovedniki and National Parks. Attempted measures for their preservation and development are on the verge of collapse, while in your Decree of October 2, 1992, Number 1155, On Specially Protected Territories, this direction was proclaimed as a priority in the government's environmental policy of the Russian Federation.

The system of protected areas of Russian was formed during a period of 8 decades and today includes 89 federal Nature Reserves and 28 National Parks, preserving natural and cultural heritage from the Kuril Islands, from the Arctic to the Caucasus. The uniqueness of this system is recognized throughout the world.

In all civilized nations, similar nature conservation lands are supported by the government; their operation is maintained by a distribution of enough governmental financing. In Russia, however, Zapovedniki and National Parks have felt themselves to be stepchildren of the government, and more recently, the situation has become unbearable. It is impossible to preserve our protected areas without any help from the government, relying only on the enthusiasm of individuals, who consider this their life's work.

The budget for Zapovedniki in 1994 in real prices was equal to 30 percent of the 1990 fiscal year budget. As agreed upon by the Ministry of Finance, the planned financing for 1995 is less than that by one-third. In such conditions, the likelihood of supporting Zapovedniki and National Parks in 1995, and especially by the year 2000, is extremely doubtful.

Zapovedniki and National Parks, designated first and foremost to maintain strict protection of their lands, are developing an acute deficit of funds, even for maintaining the most basic needs for safety equipment. They are unable to provide their law enforcement rangers with appropriate transportation and communication, weapons, and other supplies and equipment. Despite active legislation, not even insurance is provided for employees in the law enforcement service, who, on their miserly wages, continually risk their lives while fighting against unprecedented organized illegal hunting and other criminal infringements of the country's natural property.

Unfortunately the price of these numerous "deficits" is often measured in human lives. A recent example of this is the tragedy in Sayano—Shushenski Biosphere Zapovedniki, where in early September 1994 four employees of the enforcement service disappeared without a trace, having left on a patrol for several days without radio communication, needed equipment, and without appropriate preparation.

The structure and principles of the government's management of Zapovedniki and National Parks as federal objects will not survive criticism. Especially after the previous structural rearrangement, the status of the Subdivision of Nature Reserve Management has sharply fallen. Moreover, questions regarding the distribution of finances and investment policy are answered not by qualified experts in the Division of Nature Reserve Management (formerly the Main Division for Nature Reserve Management), but by employees in the financial-maintenance sphere, eternally far from understanding issues about protected areas. All attempts to adjust this situation at the Ministerial level have proven to be without result. In such an atmosphere, the Ministry stands the chance to lose many professionals in this field. In fact, the process has already begun.

We understand perfectly well the current difficult economic position and serious budgetary problems. But it is worth recalling that even during World War II, management of protected areas continued to grow and had governmental support.

We are convinced that in order to stabilize the situation for federal Nature Reserves, and to maintain normal operations and development of Zapovedniki and National Parks, it is crucial to:

1. Immediately reconsider an increase in the budget that was apportioned for Zapovedniki and National Parks for 1995.
2. With the goal of maintaining qualified management leadership of the government's system of Zapovedniki and National Parks, create within the Ministry of Environmental Protection and Natural Resources a Department for Nature Reserves, and create within the Federal Forest Service, a Division of National Parks, giving these units all management functions over the Zapovedniki and National Parks, including planning, financing, construction, labor and wages, preparation, and placement of staff.

—December 1994, Sochi, Russia

***Reprinted with permission from Russian Conservation News, c/o PEEC, RR #2, Box 1010, Dingman's Ferry, PA 18328, USA.***

# Wilderness News and Calendar

### Wilderness Inquiry Selects New Program Director

Kath Sharp, a leading Minnesota trail guide and business woman, was selected from a national pool of more than 25 qualified applicants to become Wilderness Inquiry's Program Director for Operations. Sharp brings more than 23 years of outdoor adventure experience and 20 years in business management training to the job.

Founded in 1978, Wilderness Inquiry is a nonprofit outdoor adventure organization that provides wilderness experiences to people of all ages and abilities. The organization is well known for their leadership in making wilderness experiences available to persons with disabilities.

For more information contact Wilderness Inquiry, 1313 Fifth Street, SE, Minneapolis, MN 55414, USA; (800) 728-0719. Photo: Kath Sharp

### Project Pilot Training Future Outdoor Leaders With Disabilities

Over a three-year period, Wilderness Inquiry will train 90 individuals with mild, moderate, and severe disabilities to be Integration Specialists in outdoor education and recreation environments. These integration specialists will then serve as a resource for recreation organizations wishing to diversify their recreation programs to include wilder ness. This six- to eight-day wilderness adventure training is provided by Wilderness Inquiry at no cost to the individual through Project PILOT, a program funded through the U.S. Department of Education.

"Improving the field of outdoor recreation by increasing accessibility for persons with disabilities is the goal of Project PILOT (People Integrating and Learning Outdoors Together)," said Greg Lais, Executive Director of Wilderness Inquiry. Once trained, these integration specialists will provide accessibility advice to outdoor recreation service providers and be disability consumer advocates through speaking engagements, community service, and by writing articles. This project will open new employment markets for persons with disabilities by teaching them new skills and introducing them to prospective employers.

For further information on Project PILOT, contact Nancy Simmet at (612) 379-3858.

### New Officers Elected for SAF Wilderness Working Group

The Society of American Foresters (SAF) Wilderness Working Group, one of the most active in the 20,000-member society, has elected its new slate of officers. Chairperson is Margaret Petersen, Wilderness Coordinator for the Pacific Northwest Region of the U.S. Forest Service, P.O. 3623, Portland, OR 97208, USA; Vice chairperson is Marcia Kearney, Natural Resource Staff, Pike and Isabel National Forests; Secretary is Liz Close, Wilderness Coordinator for the Northern Region of the US. Forest Service. The SAF Wilderness Working Group provides leadership and coordination among natural resource professionals, federal, and state agencies, universities, and other institutions involved in wilderness in the United States.

### WILD Foundation Relocates from Colorado to California

Bob Baron, president of Fulcrum Publishing and chairman of the board for the International Wilderness Leadership (WILD) Foundation, announced the relocation of WILD Executive Offices from Fort Collins, Colorado, to Ojai, California, to play a leadership role in a new consortium and center. WILD is a cofounder of the new International Center for Earth Concerns (ICEC) with the Humane Society of the USA and the Conservation Endowment Fund. Vance Martin will continue as President of WILD and serve as Executive Director of ICEC at their 275-acre nature center surrounded by the Los Padres National Forest. For further information, contact WILD, 2162 Baldwin Road, Ojai, CA 93023, USA; (805) 649-3535.

### 6th World Wilderness Congress Planned for India in 1997

Vance Martin, president of the International Wilderness Leadership (WILD) Foundation, announced that the 6th World Wilderness Congress will be held in Banglore, India in 1997. Partha Sarathy, prominent Indian businessman and international conservationist, will chair the 6th congress and its executive, science, and advisory Committees. For additional information, contact 6th World Wilderness Congress, WILD Foundation/I. C.E.C, 2162 Baldwin Road, Ojai, CA 93023, USA; Fax, (805) 649-1757.

### Wilderness Watch Hires New Staff Members

Fresh on the heels of its fifth anniversary, Wilderness Watch, a national grassroots organization advocating citizen stewardship of designated United States wilderness and wild and scenic rivers recently recommitted itself to change, growth, and renewal.

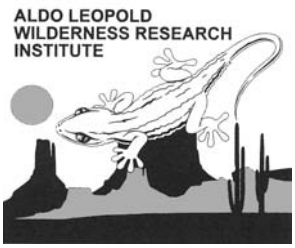
After a nationwide search, Janet Rose was selected as the new executive director of Wilderness Watch. Rose was formerly Head of Conservation Communications for the New York-based Wildlife Conservation Society. She is also a former investigative environmental journalist. According to Rose, "Wilderness Watch goals in the coming months will be to further enhance an already growing membership, expand regional chapters, work closely with the media to publicize urgent wilderness issues, and to connect with both the public and federal agencies on the critical need for better wilderness stewardship."

Two new board members: former Secretary of the Interior Stewart Udall and former Agriculture Secretary Orville Freeman round out the dynamic new team at Wilderness Watch. Both individuals played a key role in passage of the 1964 Wilderness Act and bring years of experience, knowledge, and credibility to the wilderness arena.

Mr. Udall, working under presidents Kennedy and Johnson labored tirelessly for passage of the Wilderness Act and views it as more than a law. "It is," he says, "an outward expression of the maturing of our national character." At the same time, Mr. Udall, like many others, says he is fearful that our original vision faces an uncertain future and he is committed to doing whatever he can for wilderness preservation.

Orville Freeman, another cabinet member when the Wilderness Act was passed, facilitated the designation of more than 3.5 million acres of national forest land as wilderness or wild areas.

For more information, contact Wilderness Watch, 6315 Hillview Way, Missoula, MT 59830, USA; (406) 542-2048.




### Aldo Leopold Wilderness Research Institute

The Aldo Leopold Wilderness Research Institute was established in August 1993 by the U.S. Forest Service (USFS) as an interagency effort to focus wilderness research on ecological and human dimensions pertinent to managing wilderness resources. Located on the campus of the University of Montana in Missoula, the Leopold Institute is an outgrowth of 25 years of wilderness management research at that location by the USFS Intermountain Research Station.

The goals of the new Leopold Institute are to develop and communicate knowledge needed to protect and preserve wilderness and the ecological and social values derived from wilderness. Still in its formative stages, the Leopold Institute is supported by an interagency agreement between the USFS, US. Bureau of Land Management (USBLM), National Park Service (NPS), National Biological Service (NBS), and Fish and Wildlife Service (FWS). Each of these agencies is represented by two members on an interagency steering committee that oversees institute programs and activities. In addition, commitments have been made by the NPS and NBS in conjunction with USBLM, to place permanent staff and support funds at the institute. Full development of the Leopold Institute as the focus for inter-agency wilderness research should facilitate efforts of federal agency managers and researchers to work together in better understanding and protecting wilderness resources and associated human values.

For additional information, contact the Aldo Leopold Wilderness Research Institute, P.O. Box 8089, Missoula, MT 59807, USA; (406) 721-5697.

### 7th U.S.A. National Wilderness Conference Upcoming in 1996

Margaret Petersen, chair of the Society of American Foresters (SAF) Wilderness Working Group, has announced that the 7th U.S. National Wilderness Conference is being planned for fall 1996. People and organizations are urged to send their ideas for conference sessions, special presentations, and events to Margaret Petersen, Chairperson, SAF Wilderness Working Group c/o USDA Forest Service PNW Region, P.O. Box 3623, Portland, OR 97208, USA; (503) 326-3050.

### Bolle Wilderness Management Scholarship Goes to Greg Friese at the University of Idaho

Gregory Friese, University of Idaho graduate student, has been selected by the Society of American Foresters (SAF) to receive the Arnold Bolle—Wilderness Management Scholarship for 1995. Friese is the second recipient of the award which is given annually to a student selected in national competition who "promotes and perpetuates understanding of the wilderness resource within the forest resources profession."

Friese, originally from Green Bay, Wisconsin, is a master's degree candidate in the University of Idaho Department of Resource Recreation and Tourism and is also a research assistant at the University of Idaho Wilderness Research Center. He will officially accept the award at the SAF National Convention in Portland, Maine, this fall.

### Accessibility in the National Wilderness Preservation System—Conference Proceedings Now Available

Compiled proceedings from the 6th National Wilderness Conference held in Santa Fe, New Mexico, USA, November 18-19, 1994, are available. The proceedings contain 14 papers (86p.) from a special session on accessibility to wilderness by persons with disabilities. The proceedings are a key source for persons interested in wilderness policy and practice pertinent to the subject. An associated (22p.) "Wilderness Access Decision Tool" is also available. Contact: Wilderness Inquiry, Inc., 1313 Fifth Street SE, Box 84, Minneapolis, MN 55414, USA.

### Wilderness Research Report

The latest issue of *Trends* (32-1 1995) features the topic of wilderness research. A wide array of wilderness research subjects including the science of wilderness management, the role of ecological monitoring, state agency involvement in wilderness research, the role of universities, and people with disabilities is included. For further information, call Kathy Pleasant at (202) 343-7067.

## Wilderness Calendar

**OCTOBER 4–8**
National Recreation and Park Association, Congress for Recreation and Parks in San Antonio, Texas. Contact NRPA at (703) 820-4940.

**OCTOBER 25-2**
National Cave Management Symposium XII in Spring Mill State Park, Mitchell, Indiana. Contact Larry Mullins at (812) 358-2675.

**NOVEMBER 15–18**
Sixth Rails to Trails Conference in Clearwater/St. Petersburg, Florida. Contact Deb Rawhouser at (202) 452-7792.

**NOVEMBER 27–30**
National Interpreters Workshop in Orlando, Florida. Contact Amy Galperin at (303) 239-3960.

**DECEMBER 2–7**
Confluence '95—National Meeting for Outfitters at the Reno Hilton, Reno, NV Contact David Brown, America Outdoors at (615) 524-4814.

**DECEMBER 2–7**
Quarterly Interagency Wild and Scenic River Coordinating Council Meeting. Reno Hilton, Reno, Nevada. Contact Gary Marsh, at (202) 452-7795.

**FALL 1996**
U.S.A. National Wilderness Conference, LocationT.B.A. Contact Margaret Petersen at (503) 326-3644.

**1997**
6th World Wilderness Congress, Banglore, India. Contact Vance Martin at (805) 649-3535.

# Reviews of New Books about Wilderness

**BY JAMES R. FAZIO, BOOK REVIEW EDITOR**

In this premier issue of the *International Journal of Wilderness* we are pleased to invite readers to nominate books for future reviews. Books related to any aspect of wilderness are candidates for review as long as they have been published within the past two years. We are also building a list of potential reviewers. If interested, please send your name, address, phone number, and topics of interest to the book review editor, c/o IJW.

## ***Acts of Discovery*** by Albert Furtwangler. University of Illinois Press, Urbana and Chicago, 1993. 276 pp., $29.95.

The "sinque hole," as seen here on the Clearwater National Forest, Idaho, looks much as it was described in journals written by members of the Corps of Discovery in 1805. Photo credit: James R. Fazio.

At the tenth presentation in the University of Idaho's Distinguished Wilderness Lectureship Series, Oren Lyons of the Onondaga Nation of the Iroquois Confederacy reminded us that wilderness is an invention of the white man. To native peoples, there is no such thing as wilderness.

If this is true, Meriwether Lewis and William Clark ushered in the era of wilderness that continues to this day in western United States. The Lewis and Clark Expedition of 1803-1806 was a young nation's first overland journey to the Pacific. It was also known as the Corps of Discovery and its leaders have been called "the writingest explorers of their time." Not only did the two captains keep journals almost daily, so did three sergeants and a private.

Over the decades following the successful completion of the expedition, three editions of the entire journals have been printed, as well as untold numbers of summaries and expansions. A few of the latter stand next to the journals composing what one writer has called "a kind of canon." Furtwangler's work adds to the canon. Drawing on his background as a professor of English at Canada's Mt. Allison University, Furtwangler places the expedition into the literary and philosophical context of its time. He explores with keen insight Lewis and Clark's reactions to Euro-Americans' first look at western wilderness.

Furtwangler writes in a style that is neither too academic for the casual reader of history, nor too light to be of interest to the serious scholar. Whether it is Lewis fleeing from a grizzly bear one afternoon and waking up the next morning ten feet from a huge, coiled rattlesnake, or Clark in a rare mood of rhapsody describing the Pacific—"the grandest and most pleasing prospects which my eyes ever surveyed"—the author combines the high drama of one of the world's greatest wilderness epics with some of the finest intellectual analysis ever brought to the subject. In addition, the less dramatic moments that are common to all wilderness travel—the tedium of daily treks, the routines of eating, and even the quiet contemplation about self—are not overlooked.

The author brings to his analysis an impressive array of literature, related historical events, and thinking of the period. This makes *Acts of Discovery* much more than a mere retelling of the familiar adventure. It is a book sure to be appreciated not only by readers with an interest in wilderness, but in history, literature, and other disciplines as well. The point is made that, like a wilderness experience today, the first trek into the newly purchased Louisiana Territory was both a physical feat and what Furtwangler calls "an act of mind."

Not much of the expedition's 3,000-mile route remains in a wild condition today. Part of the upper Missouri and Clearwater River segments are in wild and scenic status, but not a mile of the route lies within designated wilderness. One segment, a 12-mile stretch of what is now called the Lolo Trail, is inside the boundaries of the proposed Lewis and Clark Wilderness in the Clearwater National Forest of Idaho. Nonetheless, much of the way passes through rugged, relatively unspoiled parts of western United States. Hikers on the route can relive the past and feel the presence of those who made the first trip—"ghosts of the trail," as Furtwangler calls them. Readers who actually use wilderness as well as read about it will also appreciate the authors conclusion that the writings of the expedition "still challenge us to recognize the wilderness that is all around us here and now, and to face it with intelligent courage."

## ***Field Notes*** by Barry Lopez. Alfred A. Knopf, New York, 1994. 159 pp., $20.00.

Barry Lopez is a writer often associated with wilderness because of his award-winning nonfiction book, *Arctic Dreams* (1986) and his earlier work, *Of Wolves and Men* (1978).

*Field Notes* first came to my attention in the inflight magazine of a northwest-based airline. The reviewer—perhaps to sell the piece—promised a collection of short stories that "(point) out the meaning that Northwest landscapes can bring to people's lives." When I acquired the book and found that it opened with a nameless, faceless, first-person account of a two-week trek through a mythical southwestern desert, I knew I'd been had. Tales of an eccentric paleontologist in New York City and her affinity for fossils and an empty lot were also not my idea of stories about Northwest landscapes.

Looking to the dust jacket for explanation, I found no reference to the Northwest. Instead, I learned that this collection "evokes the longing we feel for beauty in our relationships with one another, with the past, with nature." Herein lies the strength of this book or, depending on your reading preferences, a source of disappointment. The stories are metaphors which use nature, sometimes in wilderness settings like Greenland and Alaska with human-wildlife interactions, and sometimes in the desert with sand dunes and whores. The writing is excellent, the scenes are intriguing, and the 12 stories are as the book jacket promises: "haunting" and "sparse" (blessedly short, some might say).

The situations are, however, mostly improbable, sometimes to the point of annoyance. "The Negro in the Kitchen," is a case in point. The story begins exactly as the title states. An urbane-West Coast-bachelor-investment counselor rises for breakfast and is surprised to find the man standing in his kitchen. "I've set a second place—I hope you don't mind," opens the stranger." No, fine. I can prepare two portions—but you'll have to eat what I eat." We then learn that the intruder is also an investment counselor. In fact, he is a Wharton graduate from Connecticut who is walking across the United States to better identify with the American landscape and gain "a consoling intimacy with the place …" The traveler is a connoisseur of coffee, an expert on birds (he can imitate the songs of two hundred species), a 30-mile-per-day hiker (actually, he travels at night) who recites Latin and poetry, all the while living off the land. And dogs never bark when he passes, including the mutt that let him enter the kitchen.

If you enjoy puzzling over metaphors and are interested in the spiritual aspects of landscape, especially the relationship between people and place, you will probably find this book an enjoyable read.

**JAMES R. FAZIO** is professor of Resource Recreation and Tourism at the University of Idaho, Moscow, Idaho.

# *Putting the Wild Back into Wilderness*

**BY ALAN JUBENVILLE, PH.D.**
**UNIVERSITY OF ALASKA, FAIRBANKS**

Putting the wild back into wilderness,
Putting it back where it belongs,
Putting the wild back into wilderness,
Why, Why has it taken so long?

Wilderness is our salvation, a place where wild things run free,
The wild things are important as long as they include you and me,
I'm not talking about recreational places, with trails and facilities
I'm not talking about toilets, foot bridges and other niceties.
What is important is that nature be left untrammeled, and free.
And I be left to explore the Hinterland through my own sweet equity.

The stewards of these precious lands in all their wisdom and restraint,
Have kept the pillagers at bay and commercialism constrained,
They have loaded their canons and taken positions, at the perimeters,
To defend the honor of wilderness against all who would defile her virginity,
These stewards of ours are loyal servants, protecting what is important we trust,
But if the truth were known these beautiful virgin lands still have one thing to fear—us.

For you see while holding off the enemy, we've allowed these areas to deteriorate,
From an unsuspecting foe, one we would typically not recognize or try to extirpate,
For he or she is touted as a lover of these beautiful wild landscapes,
Which offers us a spiritual paradise, a place for us to escape,
If that's the case, and surely those are words we can trust,
Do we need to protect those vestiges of wild America ... from us?

While managers can take consolation in their allocating wilderness places,
We've set aside these beautiful lands to maintain the natural stasis,
But what has happened to these wild places since that allocation?
They have ebbed in the face of public pressure and continue to undergo alteration,
But who is responsible for this debacle, if it is really true,
Are the wilderness enthusiasts the culprits, people like me and you?

Was the allocation process really complete when we set aside these places?
Did the empathy for the wildness of these lands become our guiding graces?
Or, was there some other motive for making paradise less wild?
Was there an orchestrated bureaucratic conspiracy? Were we beguiled?
When the trails were upgraded and the creeks bridged with trees,
Or when these tree-bridges became monuments to engineering, making our routes safe, dry, and free.

I have talked to a number of bureaucrats and listen to their responses,
No, they are certainly not geniuses nor are they simply dunces,
They are often the cream of the crop, their head above the daily guile,
And their minds tuned to the American public and their hearts attuned to the wild,
Then why has all this led us down the path of mediocrity?
When all we wanted was to save the wild, and we're right where we don't want to be.

In all their zeal, the bureaucrats failed to understand the consequences of their actions,
They assumed that Congress had deemed those areas wild and subsequent
management needed no sanctions,
They assumed that improving access roads and trails and enhancing trail maintenance,
Had little to do with people's perceptions and their subsequent demand,
For that enduring wilderness resource that Congress had set aside for future generations,
What they failed to recognize was the demand for that resource was based on management configurations,
Yes, those simple and often subtle acts of increasing access—a bureaucratic suture,
Have made these wild paradises, less wild, a legacy to the future,
Is there not some hope on the horizon for turning around this storm,
Or are these past decisions, so artfully carved in the landscape, now simply accepted
as the norm?

Putting the wild back into wilderness,
Putting it back where it belongs,
Putting the wild back into wilderness,
Why, Why has it taken so long?

# GUIDELINES FOR MANUSCRIPT CONTRIBUTORS

The *International Journal of Wilderness* (IJW) editorial staff invites contributions pertinent to wilderness worldwide, including issues in planning and management, education, research, international perspectives, and inspirational features. IJW also publishes articles, commentaries, letters to the editor, photos, book reviews, upcoming events, and announcements. A smooth, reader-friendly style is encouraged.

The IJW staff solicits manuscripts for peer review not previously published or simultaneously submitted elsewhere; materials revised or reoriented by the author(s) sufficiently to constitute a new contribution are also welcome. The IJW staff also invites articles that will not be peer-reviewed, and these may include previously unpublished material. Authors are requested to accompany their manuscripts with a cover letter explaining: 1) any previous use of data or information in the manuscript, 2) how the submitted manuscript is different this time, and 3) that it has not been submitted elsewhere for publication.

The International Wilderness Leadership (WILD) Foundation holds copyright for materials printed in the IJW. Authors will be asked, prior to publication, to assign their rights to the WILD Foundation. Authors whose work is not subject to copyright, such as material produced by government employees, should so state when submitting their manuscripts. The managing editor reserves the right to edit all manuscripts.

Four major types of articles are published in the IJW:

### 1. Manuscripts

These include both peer-reviewed and nonpeer reviewed reports of wilderness-related research, planning and management, international, and education issues presented in a factual manner. It is *strongly* advised the Results (factual) and Discussion (interpretive) sections be kept separate to enhance clarity; sections reporting recommendations/implications are encouraged. Articles should have an *Abstract* of one paragraph (up to 150 words) in which objectives, methods, and major findings are clearly summarized. Planning and management, science and research, and education articles may be peer-reviewed prior to acceptance. Photos with captions illustrating key points in the submitted text are strongly encouraged.

### 2. Commentaries

A commentary consists of a reasoned argument culminating in recommendations or proposals for some action (i.e., a research program, a change in administrative procedure, etc.). Narratives should be approximately 500 words and deal with an important wilderness issue. Accompanying photos are encouraged.

### 3. Special Features

The IJW will contain special feature sections: Soul of the Wilderness will present inspirational articles and a pro-active voice for global wilderness. Nominations of potential authors or materials are encouraged. Wilderness @ Internet will describe and review wilderness-related internet bulletin boards. Potential authors for this latter column are asked to submit an abstract of their idea(s) to the managing editor.

### 4. Letters, Announcements, Photos, and Updates

Letters to the editor, announcements of meetings and important events, photos, administrative policy updates, major personnel changes, and special event information is welcome.

### Style and Form

Manuscripts must be submitted in final form. The author is responsible for accuracy of data, names, quotations, citations, and statistical analyses. Strict economy of words, tables, formulae, and figures should be observed and specialized jargon avoided. Submissions from the United States will use English units, followed by metric units in parenthesis. Submissions from outside the United States will feature metric followed by English units in parenthesis. Usage must be consistent throughout the manuscript. Target length of articles is 2,500 words; shorter articles may be published sooner; longer articles may be rejected for length.

### First Submission

Initially, two double-spaced copies of the manuscript should be submitted to the Managing Editor. All accompanying tables, charts, and photo captions should be included.

### Final Submission

Once manuscripts have been reviewed, the material accepted, and review comments have been incorporated, the final manuscript should be submitted with one computer diskette, clearly labeled with the title and version of standard software (DOS preferred), author(s) name, and document title as it appears on the diskette. Do not use PageMaker or other publishing programs. Typing should be in upper and lower case; avoid using all CAPS. Paragraphs must be double-spaced and in block format. The final document on disk should be without formatting (e.g., no italics, boldface, underlining, tabs, or indents). These annotations should be indicated in red pen on one unformatted hard copy.

Subheadings are desirable. Article titles should be short and explicit, beginning with a key word useful in indexing. The title, authors name(s), and the abstract should be found at the top of the first page. At the end of the manuscript please include a 2–3 sentence biography for each author. This should contain affiliation, location, and contact information, including mailing address, telephone number, and e-mail address.

### Figures and Tables

Originals must be enclosed with the final manuscript. It is not necessary to format figures and tables, but if the author chooses to do so, all graphics must be converted to .EPS or .TIF files, and both the screen and printer fonts must be included on the disk. If the figures or tables are not formatted, please include the data in a word-processing format (a listing) so that the production department can create the chart without retyping the data.

### Literature Citations

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

### Illustrations

All photographs, line drawings, maps, and graphs are designated as figures and must be keyed to the text. They should be submitted unmounted (no larger than 8 1/2 x 11 in.), consecutively numbered, and identified with soft pencil on the reverse side. Photo captions should be listed at the very end of the manuscript. Figures should not duplicate data presented in tables.

### Photographs

Ideally, photographs should be glossy black-and-white, with good contrast. They should be no smaller than 4 x 5 in. and no larger than 8 1/2 x 11 in. High resolution color slides and photos are also acceptable. These will be printed in black and white in the journal.

### Tables

Each table should be typed on a separate page, unless it is incorporated into the text on the disk. Each table must be consecutively numbered, titled, and keyed to the text. Titles should be descriptive as to what is presented. Excessively large tables or unnecessarily detailed statistics are to be avoided.

### Questions

Direct all correspondence pertaining to manuscripts, including name, address, business phone, fax, and e-mail address of the lead author, to:

John C. Hendee, Managing Editor
International Journal of Wilderness
University of Idaho Wilderness Research Center
Moscow, ID 83844-1144
Phone: (208) 885-2267
Fax: (208) 885-2268 e-mail: wrc@uidaho.edu