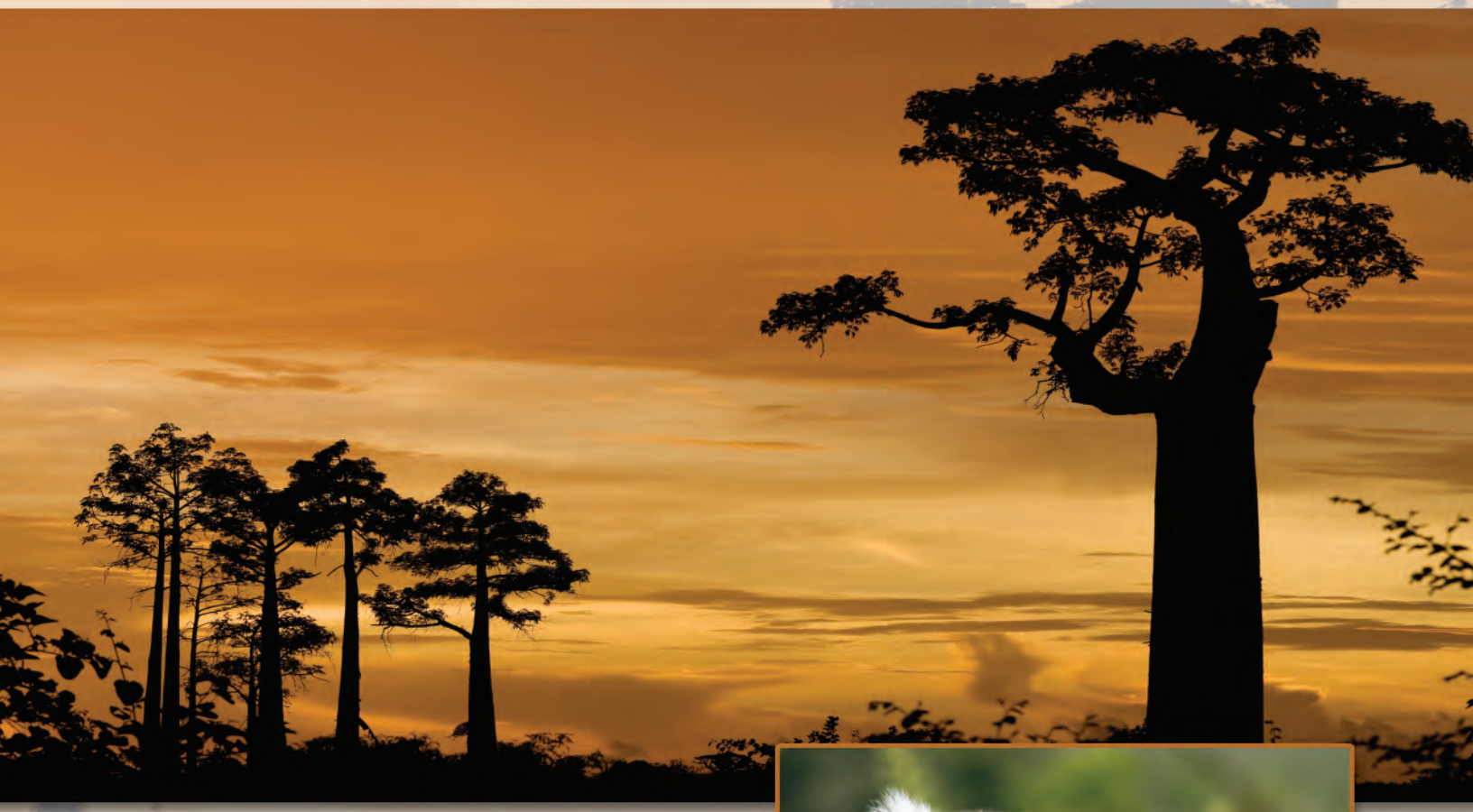
INTERNATIONAL

# Journal of Wilderness



## In This Issue

- Adirondack Summit Stewards
- Challenges for Wildland Preservation
- Legislation and Special Provisions
- Canada, Mexico

AUGUST 2010 VOLUME 16, NUMBER 2

INTERNATIONAL

# Journal of Wilderness

AUGUST 2010 VOLUME 16, NUMBER 2



### Disclaimer

The *Soul of the Wilderness* column and all invited and featured articles in *IJW*, are a forum for controversial, inspiring, or especially informative articles to renew thinking and dialogue among our readers. The views expressed in these articles are those of the authors. *IJW* neither endorses nor rejects them, but invites comments from our readers.

—John C. Hendee, *IJW* Editor-in-Chief

***On the Cover***

**FRONT:** Sunset in the Valley of the Baobabs, Morondava, Madagascar. (Image courtesy of Cristina Mittermeier © – International League of Conservation Photographers)

**INSET:** Black and white ruffed lemur (*Varencia variegata*), Andasibe, Madagascar. (Image courtesy of Cristina Mittermeier © – International League of Conservation Photographers)

# International Journal of Wilderness

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


## EDITORIAL BOARD

Perry Brown, University of Montana, Missoula, Mont., USA
H. Ken Cordell, Southern Research Station, U.S. Forest Service, Athens, Ga., USA
Lisa Eidson, University of Montana, Missoula, Mont., USA
Vance G. Martin, WILD Foundation, Boulder, Colo., USA
Rebecca Oreskes, White Mountain National Forest, Gorham, N.H., USA
John Shultis, University of Northern British Columbia, Prince George, B.C., Canada
Alan Watson, Aldo Leopold Wilderness Research Institute, Missoula, Mont., USA

## EDITOR-IN-CHIEF

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

## MANAGING EDITOR

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

## ASSOCIATE EDITORS—INTERNATIONAL

Andrew Muir, *Wilderness Foundation Eastern Cape, South Africa*; Karen Ross, *The Wilderness Foundation, Capetown, South Africa*; Vicki A. M. Sahanatien, *Fundy National Park, Alma, Canada*; Anna-Liisa Ylisirniö, *University of Lapland, Rovaniemi, Finland*; Franco Zunino, *Associazione Italiana per la Wilderness, Murialdo, Italy.*

## ASSOCIATE EDITORS—UNITED STATES

Greg Aplet, *The Wilderness Society, Denver, Colo.*; David Cole, *Aldo Leopold Wilderness Research Institute, Missoula, Mont.*; John Daigle, *University of Maine, Orono, Maine*; Joseph Flood, *East Carolina University, Greenville, N.C.*; Greg Friese, *Emergency Preparedness Systems LLC, Plover, Wisc.*; Lewis Glenn, *Outward Bound USA, Garrison, N.Y.*; Gary Green, *University of Georgia, Athens, Ga.*; Kari Gunderson, *University of Montana, Missoula, Mont.*; Dave Harmon, *Bureau of Land Management, Washington, D.C.*; Bill Hendricks, *CalPoly, San Luis Obispo, Calif.*; Christopher Jones, *Utah Valley State College, Orem, Utah.*; Cyril Kormos, *The WILD Foundation, Berkeley, Calif.*; Greg Kroll, *El Rito, N.M.*; Ed Krumpe, *University of Idaho, Moscow, Idaho*; Yu-Fai Leung, *North Carolina State University, Raleigh, N.C.*; Bob Manning, *University of Vermont, Burlington, Vt.*; Jeffrey Marion, *Virginia Polytechnic Institute, Blacksburg, Va.*; Christopher Monz, *Utah State University, Logan, Utah*; Connie Myers, *Arthur Carhart Wilderness Training Center, Missoula, Mont.*; David Ostergren, *Goshen College, Wolf Lake, In.*; Trista Patterson, *USFS, Sitka, Alas.*; John Peden, *Georgia Southern University, Statesboro, Ga.*; Kevin Proescholdt, *Izaak Walton League, St. Paul, Minn.*; Joe Roggenbuck, *Virginia Polytechnic Institute, Blacksburg, Va.*; Keith Russell, *Western Washington University, Bellingham, Wash.*; Tod Schimelpfenig, *National Outdoor Leadership School, Lander, Wyo.*; Rudy Schuster, *USGS, Fort Collins, Colo.*; Michael Tarrant, *University of Georgia, Athens, Ga.*



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

**Manuscripts to:** Chad P. Dawson, SUNY-ESF, 320 Bray Hall, One Forestry Drive, Syracuse, NY 13210, USA. Telephone: (315) 470-6567. Fax: (315) 470-6535. E-mail: cpdawson@esf.edu.

**Business Management and Subscriptions:** The WILD Foundation, 717 Poplar Ave., Boulder, CO 80304, USA. Telephone: (303) 442-8811. Fax: (303) 442-8877. E-mail: info@wild.org.

**Subscription rates (per volume calendar year):** Subscription costs are in U.S. dollars only—$35 for individuals and $55 for organizations/libraries. Subscriptions from Canada and Mexico, add $12; outside North America, add $24. Back issues are available for $15.



All materials printed in the *International Journal of Wilderness*, copyright © 2010 by the International Wilderness Leadership (WILD) Foundation. Individuals, and nonprofit libraries acting for them, are permitted to make fair use of material from the journal. ISSN # 1086-5519.



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

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

**Website:** www.ijw.org.

Printed on recycled paper.



## SPONSORING ORGANIZATIONS

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

EDITORIAL PERSPECTIVES

# Bureaucratic Response to Declining Wildland Use

## *Back to the Future?*

BY JOHN SHULTIS

In the early 20th century, protected area agencies tended to focus on increasing visitation in wildlands rather than preserving these areas. The growth of recreational use in public parks and (eventually) wilderness areas was seen as a necessity for establishing public support for both wildlands and the agencies that managed these areas. A key underlying assumption was that increased public support for protected areas was a sine qua non for the political support (i.e., funding) of these agencies.

After World War II, public visitation of wildlands grew by leaps and bounds, and the agencies used this growing demand to apply for more government funding to expand protected area systems and bureaucracies. This link between increasing recreational use, public appreciation, and political support for recreation management agencies became an unquestionable truth. By the 1970s, increasing visitor levels led to a greater focus on the environmental and social impacts of wilderness recreation, and the preservation function of most protected area systems and agencies started to receive much more attention.

However, in the last few years, these patterns seem to have shifted. Visits to protected areas in many Western nations peaked in the mid-1990s, and by the mid-2000s, several influential books and articles highlighted a decline in wildland recreation. Bureaucracies were also facing declines in funding from the 1980s, as the "small government" component of neoliberalism led to widespread cuts in federal government funding for environmental agencies in most Western nations.

Faced with both decreasing visitation and funding, the wildland agencies seem in the early 21st century to be shifting back to the focus on the "use" function, much as they did at the start of the 20th century. That is, park and conservation agencies are increasingly concerned about the drop in visitation in many protected area systems. Their concern is expressed as an opposite corollary of the original "use leads to public appreciation which, in turn, leads to political support" mantra: If recreational use is decreasing, then public and political support for wildlands and the agencies that manage them must also be decreasing. This concern is expressed in many recent park agency documents noting their attempts to "reconnect" or "reengage" the public with wildlands. But has decreasing use really lead to decreasing public support? This is an unanswered question, although the agencies seem to assume this relationship.

The extent of the decrease in recreational use of wildlands is still debated, but the agencies themselves do not seem to doubt there have been declines in use, and they have begun to create policies and procedures that seek to increase visitation. Is there a danger in having these agencies place their focus back on use rather than preservation values? Is the early 20th-century focus on increasing use returning? I think there is a clear danger of such a shift, and wilderness advocates must continue to challenge agencies to look beyond use levels to acknowledge the preservation function of wildands.

In this issue of *IJW*, we include North American articles on stewardship activities and programs from the Adirondack Mountains of New York to the Janos Biosphere Reserve of northern Mexico, and of the challenges for wildland preservation from Canada to Mexico. U.S. wilderness legislation and how to search its history and intent are presented in two articles.

JOHN SHULTIS is the *IJW* book review editor; email: shultis@unbc.ca.

# A Letter to My Friends in Wilderness

BY GEORGE DUFFY

***Editor's Note***: This "Farewell" essay was written by George Duffy to fellow wilderness stewards after he learned he had a rare and fatal cancer. This letter reflects how George lived his life: full of verve and passion for wilderness, and always striving to improve wilderness stewardship. George was the steward for several wildernesses in California, pioneering new education programs that reached the hearts and minds of thousands of young people, helping them understand and appreciate their wilderness legacy. George was known for always speaking up for the right decision for wilderness. For his effort and commitment, George received two U.S. national awards: the Bob Marshall Wilderness Award and the Trapper Lake Wilderness Award. Out of respect for such a distinguished career, the chief of the U.S. Forest Service, on learning of George's illness, took the extraordinary step of writing a personal letter praising him, saying, "You are a leader in every sense of the word, and your 'Farewell' essay will be a guiding light to everyone who works for wilderness in the future. I will personally see that it is shared widely across the agency." Many people will mourn the loss of George, who died July 8, 2010, but he would want us to think of him with his boots on the ground, walking faster than most of us are capable, head held high, and loving every minute of a life dedicated to wilderness! It is tragic to lose George's passionate reminders to always do the right thing for wilderness, and through this essay George's memory and his urging to keep our feet close to the wilderness fire will live on in the soul of the wilderness. *Editorial note by Peter Landres, Aldo Leopold Wilderness Research Institute, Missoula, Montana.*

As my life comes to a close, I feel compelled to express my gratitude to those of you who have journeyed together with me in wilderness and contributed to my understanding of wilderness and subsequently of myself. I hope you will indulge me a few moments while I try to share with you what I have learned on our journey together.

The Wilderness Act of 1964 marked a turning point in America's attitude toward wild places. It was an acknowledgment that wild places were not only coming under the plow and the paving machines, but that their loss by such means was accelerating and would soon lead to a society impoverished by the loss of the fundamental relationship between humans and the lands which defined them. As Roderick Nash said, "It was time for restraint—restraint in our exploitation of natural resources, and restraint in our attitudes about the place of other creatures and natural forces in our lives."

**George Duffy in his favorite wilderness, the Manzano Mountain Wilderness. Photo by Linda Filippi.**

The language of the act is like few other laws we have enacted. It reads more like poetry than law and evokes an emotional response that invites introspection and envisioning of a future expressive of our concern for restraint and accommodation of other life-forms. This, in contrast to a precise formulaic law, was the genius of the act's principle author, Howard Zahnizer. He fixed the concept of wilderness in our minds rather than just in law or on a piece of real estate—and compelled us to look for and understand the characteristics of wilderness in our lives as well as in our landscapes.

The Wilderness Act will challenge and enrich scholars, legal experts, wilderness managers, and wilderness advocates for as long as there is wilderness. We can only hope that the spirit that created this awareness of our place in the natural order prevails in our thinking. For, as Joseph Wood Krutch said, "Wilderness is the permanent home of the human spirit."

## Wilderness Policy Evolves

Although the Forest Service had been administratively managing wild and primitive areas within the national forests since 1924, the passage of the Wilderness Act in 1964 created a National Wilderness Preservation System (NWPS) within the national forests, and assigned responsibility to the Forest Service for managing 9 million acres of wilderness in accordance with this new law. The Forest Service quickly pulled together a team of staff and line officers who had some experience in managing wild areas, and charged them with writing management policy and direction to administer this new *NWPS—Forest Service Manual Section 2320*. It consisted of 34 pages. Today it is 55 pages and in the process of being revised.

When you hold that *Forest Service Manual Section 2320* in your hands, you hold a precious symbol of the Forest Service's commitment to America's wilderness—one which is being challenged by all manner of argument.

Within the agency, there are those who are impatient with the idea of the minimum tool and craft arguments to justify the use of chain saws, trail machines, jackhammers, helicopters, and other expedients for the sake of convenience or economy.

There are those who are wedded to the idea of mitigating the challenges of wilderness by constructing improvements, identifying and removing hazards, writing detailed guidebooks, and publishing detailed maps. There are those who feel that the existing definition of wilderness may be inappropriate to an evolving social conscience rooted in technology, urbanization, and speed, and that management must be modified to reflect those changing social values. There are those who feel that human intervention in natural processes within wilderness is necessary when those processes don't fit their perceptions of what is natural. There are those who hold an anthropocentric rather than biocentric view of wilderness—and accordingly suggest that accommodation for human use, rather than preserving an untrammeled wilderness resource, be the paramount consideration when shaping wilderness policy.

Outside the agencies, there are those who, in their eagerness to see more public lands gain the protection of wilderness, have agreed to legislative provisions which compromise the wilderness quality of the very lands they wish to preserve as wilderness.

There are those who think of wilderness as beautiful landscapes or wildlife sanctuaries or recreation areas rather than as places that integrate the enduring physical, biological, and spiritual dynamics of an untrammeled part of the Earth.

The authors of the Wilderness Act held no such views. They were keenly aware that there were but few remnants of the landscapes that had shaped the American character, and they wanted to ensure that these were preserved in the condition of wildness which confronted and influenced our early pioneers. They knew that wilderness had to remain a point of reference in both our natural and cultural histories, an enduring benchmark for our journey through time and space, unchanged by human intervention and subject only to natural forces. They knew that wilderness was an indispensable part of our humanness and was critical to our understanding our place in the universe.

Today, the American public can be grateful that you have been vigilant and stood shoulder to shoulder with the dedicated group of wilderness advocates within the public land management agencies to assure that these challenges to wilderness are being resolved in favor of the constructionist philosophy so well articulated in the manual direction.

## Wilderness Stewardship

You are the stewards of America's wilderness and I want to speak to you of stewardship. *Webster's Dictionary* defines a steward as: "One called to exercise responsible care over the possessions entrusted to him [her]; One who manages another's property."

I am extremely grateful to you for having chosen to be stewards of these lands. You have assumed a sacred trust, to be executed with reverence, humility, and a profound sense of responsibility. You are not engaged in a business or delivering a product or providing a

service or producing a commodity. You are engaged in no less than preserving the nation's precious remaining repositories of wildness and guarding the permanent home of our human spirit.

Over the years, I have watched as the growth and complexity of the NWPS has presented you with new stewardship challenges. You have met those challenges with care and deliberation and resolved them with uncanny respect for the language and intent of the Wilderness Act.

Today, you can be proud that since the passage of the Wilderness Act in 1964, which designated 9 million acres (3.6 million ha) of Forest Service land as wilderness, the people of the United States have respected your stewardship and repeatedly petitioned the Congress to entrust to you the care of more wilderness areas. Their efforts have placed more than 109 million acres (44.3 million ha) in your care.

You can be proud that the federal land management agencies have created the Arthur Carhart Wilderness Training Center to provide training in wilderness philosophy and wilderness stewardship for federal employees. You can be proud that the federal land management agencies have created the Aldo Leopold Wilderness Research Institute to conduct social and biological research to support and improve wilderness stewardship, and you can be proud of your role in preserving that "enduring resource of wilderness" envisioned by the authors of the Wilderness Act.

As you enter another year of wilderness stewardship, please be as caring of yourselves as you are for wilderness. Take the time to open yourselves fully to the dynamics of wild landscapes and their effects on your mind, body, and spirit. Share your passion with your colleagues and the Earth—become fully alive.

## Wilderness Experiences

These days you share with wildness are gifts you will treasure forever.

My fondest memories are of those times when nature's influences were at the end of my nose: being picked up by a gusty ridgetop wind and pitched through the air like a rag doll; huddled on the lee of a rocky summit during a storm and feeling hypothermia trying to rob me of my abilities; being carried along in the tumbling whiteness of an avalanche; walking out of the snow and ice of high mountains and again smelling the green of the earth; lying in a sunny meadow and sensing that all the spirits there were filling my being with strengths unknown and unknowable; sensing the unseen presence of the others in the landscape; and feeling a timeless wisdom trying to order my thoughts to wholeness.

Go—find yourself in the wilderness—be at home.

For most of us, our connection with wilderness is commonly understood to be rooted in the cultural and aesthetic responses that evolved from the experiences of early explorers and settlers on the new landscapes of America. We have recently discovered, however, that the underlying basis for our responses to wilderness goes deeper—much deeper—going to the wilderness is going home.

Anthropologists and others have been suggesting for a long time that we are still the wild creatures we were in the Pleistocene. We haven't changed. Only our circumstances have changed. Paul Shepard, perhaps the most insightful scholar of the history and evolution of human ecology wrote: "The discovery of the DNA by Watson and Crick was hailed for its implications for human health and well being. Soon it is expected we will be able to create the perfect banana or the perfect cow and clone it forever. We may soon be able to change the order of genes in our chromosomes to make us taller, thinner, stronger—maybe even less maladapted to our current circumstances." But more importantly, the mapping of the human genome confirmed that, genetically, we are still wild, Pleistocene creatures. Finally, an answer as to why we feel so at home in wilderness.

Shepard declared: "The home of our wildness is both etymologically and biologically wilderness. Although we may define ourselves in terms of culture and language and so on, it is evident that the context of our being now, as in the past, is wilderness—an environment lacking domestic plants and animals entirely, and to which, one might say, our genes look expectantly for those circumstances which are their optimal ambience." "The time is coming," he said, "to understand the wilderness in its significance, not as adjunct to the affluent traveler, to an educated, esthetic, appreciative class, or to thinking of nature as a Noah's ark in all of its forms, but as the social and ecological mold of humanity itself, which is fundamental to our species." To understand the significance of wilderness, we must take the time to separate culture from biology, learning from instinct and to search deep within for those ancient gifts that truly inform our humanness.

I have but one request of you: Go—find yourself in the wilderness—be at home.

Let your genes once again find expression in the world that defined them. Rejoice in your humanness. You are a genetic library of gifts informed by centuries of life in wilderness, gifts from the experiences of antecedent

creatures—ichthyic, reptilian, and mammalian—that lie still in your brain stem. Gifts from the struggles of the naked ape with neither fang nor claw who was able, not only to survive, but to adapt and flourish—simply and elegantly—in wild landscapes.

When we first walk into wilderness, we feel like alien creatures, intruding into the unknown—but if we stay a while, usually about a week, and pay attention to ourselves, those gifts become apparent. We become aware that our eyes see better—we can pick things out in the landscape more keenly; we can measure distance more accurately; and shape, color, and contrast are vividly apparent. Our noses discriminate and identify the odors on the wind, the smell of a bighorn is a lot different than that of a bear, there is a marsh upwind. The sounds we heard on our first day came from a general direction, but now our binaural senses are so keen we can almost pinpoint the source and distance of a sound—and identify it. The awkwardness we first felt when moving over broken ground has been replaced by a fluid economical rhythm of movement that seems almost effortless. Our spine flexes, gathering and releasing energy; our pelvis tilts, our center of gravity is keenly felt, and we are again those confident primal animals on the landscape.

> You have assumed a sacred trust, to be executed with reverence, humility, and a profound sense of responsibility.

We sense our relationships with the other creatures with whom we share these landscapes—relationships which reaffirm our humble role as members of the vast community of life. These are not new skills learned, they are ancient abilities—pulled from the shelves of that genetic library deep within our being.

As we peer into campfire flames, the comfort of thousands of fires, in thousands of caves, over thousands of years, warm us from the inside as well from the outside.

The diminuendo of the canyon wren and the raucous scolding of the Steller's jay invite our hearts to sing. The warmth of the sun and the snap of the cold affirm that we are alive, and vulnerable. The mountains, the deserts, the storms, and the rivers challenge our cunning and demand our respect. The vastness of the landscape humbles and fixes us in scale. As we lie on the Earth in the evening, the march of Orion across the heavens fixes us in time. We are still those Pleistocene creatures, at home and full of the wonder of being. This is the wildness in our genes, found manifest in a simple, bipedal hominid—surrounded by a peace that transcends time, and in a place we shall always need: Wilderness.

Thanks for the ride.

## References


Krutch, J. W. 1958. *Grand Canyon: Today and All Its Yesterdays*. New York: William Sloane Associates.

Nash, R. 2001. *Wilderness and the American Mind*, 4th ed. New Haven, CT: Yale University Press.

Shepard, P. 1993. Wilderness is where my genome lives. Presentation at the 5th World Wilderness Congress, Tromso, Norway.



GEORGE DUFFY was a retired U.S. Forest Service wilderness ranger living in Mountainair, New Mexico.

# Adirondack High Peaks Summit Steward Program

BY JULIA GOREN

It's a normal day here at work—about 60 degrees with sun breaks between the drifting clouds. When the wind blows it's a bit chilly, but I appreciate the breeze because the black flies are biting when it dies down. Cup-shaped Diapensia blossoms and the startling fuchsia of lapland rosebay flowers catch my eye across the summit. There is fairly steady traffic today and I've been fielding plenty of the usual questions—What's that mountain there with the slides? What's the name of that purple flower? How's the trail on the other side? You really hike this every day? What makes these plants special? What do you do when it rains?

Yes, just another typical day as a summit steward in the Adirondack alpine zone.

## Introduction: The Alpine Zone

A small but ancient ecosystem sits atop the highest peaks in the northeastern United States, a remnant of the last period of glaciation. Alpine areas are home to some of both the rarest species in the East and the region's greatest recreational opportunities. The clash between fragile plants and high visitor use makes these areas a tremendous case study for wilderness management. The Adirondack High Peaks Summit Steward program (AHPSSP) is a model stewardship program, using partnerships, limited resources, and volunteers to protect New York's alpine zone.

Alpine areas of the northeastern United States are akin to habitats of the Canadian tundra (Slack and Bell 2006). Small Arctic plants (see figure 1) cover the landscape, thriving in the harsh summit conditions as they have done for the past 10,000 years. Several factors make this ecosystem unique among global alpine areas. First, as these plants are the same species that are found in the Canadian Arctic, they are in a small geographical pocket far south of the rest of their range. Unlike western North America, where alpine species are generally found above 11,500 feet (3,505 m) (Zwinger and Willard 1972), northeastern alpine areas are comparatively low in elevation, generally above 4,800 feet (1,460 m).

**Figure 1—*Diapensia lapponica*. Photo by Seth Jones.**

Alpine ecosystems exist in the northeast as a result of the glacial history of the region, but they persist today because they are adapted to the extreme climate of the alpine zone. Cold temperatures, short growing seasons, nutrient-poor soils, and strong winds keep alpine areas inhospitable to any but specially adapted species (Slack and Bell 2006). Small changes in microclimate, such as a degree or two in difference, or an inch more of snow or soil, have significant impacts on plant communities. Centimeters in topography can mean the difference between ideal habitat and uninhabitable areas for the plant species found in these areas.

As a result of their geographic location, these alpine areas are within a day's drive of more than 70,000,000 people. The lower elevations at which alpine species are found make them more accessible than many of their western counterparts. The high concentration of rare species combined with their accessibility and the appeal of alpine locations for recreation places these species in a position of

vulnerability. Alpine species thrive in locations where the growing is tough, but they are fragile and threatened by human trampling.

Alpine areas in the Northeast may be found in some of the most iconic locations in Maine, New Hampshire, Vermont, and New York. Efforts to protect these areas may be found in each of these states (Slack and Bell 1995). Programs range from having full-time and seasonal staff to being entirely volunteer run, depending on the area and local stewardship history.

New York's alpine zone is found entirely within the Adirondack State Park, a six-million acre (2.4 million ha) patchwork of public and private land in the northern part of the state (see figure 2). The Adirondack alpine zone comprises a small geographic area spread over several mountain summits. This area is home to some 27 rare, threatened, or endangered species of vascular plants and as many equally rare nonvascular plants (Young and Weldy 2006). Approximately 173 acres (70 ha) of this unique ecosystem exist in the state, all of it located amid heavily used hiking areas.

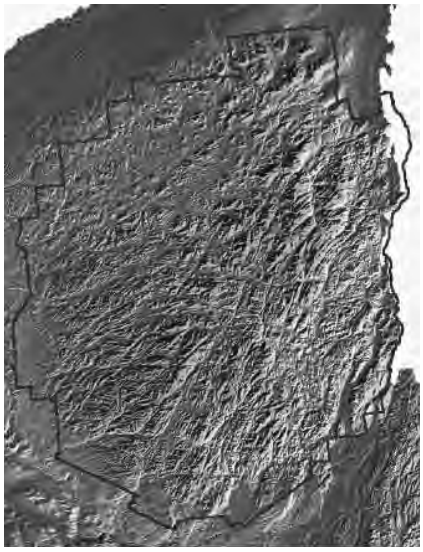


**Figure 2—The major alpine peaks of the Adirondacks shown as circles.**

## Summit Stewardship

The AHPSSP was created in 1989 by a grassroots group, made up of nonprofit hiking clubs, conservation groups, dedicated individuals, and a state agency. The need for an educational presence on the peaks was identified by Dr. Edwin "Ketch" Ketchledge, with recognition that previous management efforts were not enough to protect the rare alpine vegetation from human trampling with increasing numbers of recreationists. It is a partnership of the Adirondack Mountain Club (ADK), the Adirondack Chapter of the Nature Conservancy (ANC), and the New York State Department of Environmental Conservation (NYS DEC). We protect the Adirondack alpine ecosystem through backcountry education, conservation, and research. Stewards interact with the public on the highest summits; we also complete conservation projects to ameliorate erosion, delineate trails, and participate in research.

Summit stewards are educators; we hike to the summits and talk to every individual that comes up above tree line during a typical summer day on Mt. Marcy or Algonquin Peak, the two highest mountains in the state. We staff these peaks seven days a week from the beginning of June through the beginning of September, with additional weekend coverage in May and through the middle of October. Depending on staff and volunteers, we also staff several other peaks on a regular basis. On a given summer day we see anywhere from a handful to more than 200 people and enlist their help in staying on solid bedrock and off of the fragile vegetation (see figure 3). On average, we talk to between 12,000 and 14,000 visitors every summer, asking their help and encouraging them to spread the word to others.

One of the strengths of this program is its collection of partnerships

**Figure 3—Summit steward Duncan Lennon educating a group about alpine vegetation. Photo courtesy of the AHPSSP.**

that have been in place for more than 20 years. Each of the partnering organizations contributes financially and through in-kind support and staff time. ADK provides education and trails expertise, field experience, and direct supervision for seasonal staff. ANC provides scientific expertise and access to additional ecologists and botanists through the New York Natural Heritage Program. NYS DEC is the land management agency and provides technical and financial assistance. The AHPSSP has strength, credibility, and funding as a result of this partnership. Additional support to keep the program running is provided through donations, grants, and sponsorships.

## Volunteers

Volunteers also do critically important work, making it possible for the steward program to do a better job protecting the Adirondack alpine zone. We have two main types of volunteer that help the AHPSSP. First, we have trained volunteers who work on the summits, essentially doing the same educational job as the three paid seasonal stewards. Volunteers may be on the summits one or two days each season or they may be

out for multiple days each week, depending on the individual interest and availability. Any amount of time committed is useful to the program and allows us to extend our coverage beyond Mt. Marcy and Algonquin Peak. In 2009 the AHPSSP had a 29% increase in coverage days, including expanding regular coverage to a new location, thanks to dedicated volunteers. There are currently six trained semiregular volunteers with the program, in addition to the three seasonal and one full-time staff member.

The Adirondack alpine zone comprises a small geographic area spread over several mountain summits.

Education is not the only work of the AHPSSP and it is not the only way that interested visitors can get involved. Summit stewards also do trail projects focused on keeping hikers on solid bedrock and off of fragile vegetation and soils. Rock cairns mark trails, smaller scree walls define the tread and serve as a visual reminder of where not to walk, and rock packing protects soils from erosion. Above tree line there are no trees to work with, naturally, so summit steward trail work is done with rock.

Surprisingly, rocks on the summit are not easy to come by. First, the bedrock geology of the high peaks is such that there is comparatively little loose rock. Second, what loose rock exists is holding fragile alpine soils in place, so moving those rocks is counter to our mission. Thus, the first step in any trail work project in the alpine zone is quarrying. This can be done in two ways: we can find rocks and move them where they are needed, or we can ask willing hikers to bring them up from the trailhead (see figure 4).

This volunteer effort, called the Carry-A-Rock program, was established in 1999 and has proven to be an enormous help in protecting the alpine zone. The rock packing and scree wall building that stewards do would be impossible without these rocks. Small stones are quarried from nearby fields, power washed to prevent the spread of invasive species, and hauled to the trailhead, where a sign encourages hikers to carry them to the summit. Above tree line, a sign indicates where hikers should deposit their stones. With them we create small scree walls to serve as a visual reminder to stay on solid bedrock and off fragile vegetation. These walls are a simple, yet highly effective means of protecting the vegetation, as before and after photographs demonstrate (see figure 5).

**Figure 4—Volunteers participate in the Carry-A-Rock program. Photo courtesy of the AHPSSP.**

This program allows visitors to actively participate in the preservation of the alpine zone. It is a volunteer effort that requires no training or additional time commitment on the part of visitors and yields tangible results. As such, it has been a very successful effort. Over the course of the past decade, approximately 15 tons of small rock have been moved, and thousands of people have participated.

## Photopoint Monitoring

Summit stewards are frequently asked, "Is it working? Are alpine areas recovering?"

**Figure 5—Algonquin Peak, 1992 (left) and 2008 (right). Note scree wall, rock packing, and vegetation regrowth in 2008 photo. Photo courtesy of the AHPSSP.**

One simple, qualitative way to answer this question is to compare before and after photographs from the same area. In 1999, Summit steward Matt Scott established a photographic monitoring system for tracking vegetative changes over time in the alpine zones of the Adirondacks. Historical photographs from the mid-1960s through the mid-1980s were used as the baseline for this systematic photographic monitoring project. Most of the historical photographs had been taken by Dr. Edwin H. Ketchledge, professor of forestry at the State University of New York in Syracuse, whose revegetation, restoration, and cataloging of alpine species was the foundation of the AHPSSP. The photographs focus on highly degraded areas. Photo point monitoring represents a long-term data set that illustrates rates of trampling, erosion, and vegetative regrowth. It is a useful tool in assessing the AHPSSP's protection of alpine habitat.

To establish the photo points, Scott located the point where each of the historical photographs (approximately 50 points on eight mountains) had been taken and then replicated the photograph. Each photo point was carefully created to ensure easy replication. Camera height, angle, direction, aperture setting, lens, and film speed were determined through careful examination of the historical photographs. Locations were marked in the field with a small nail drilled into the bedrock and directions were recorded. Later retake cycles have added coordinates for relocation using a GPS unit. Each photo point was assigned a retake cycle based on severity of disturbance, location, and ecological significance (Slack and Bell 2006). Since 1999, photo points have been duplicated in 2004, 2007, 2008, and 2009 (see figure 6).

One goal in the establishment of the photo point monitoring project was to create systematic monitoring that could be easily replicated with relatively inexpensive equipment by stewards without specialized training or a background in field research. During the 2009 field season, 40 of the 50 photo points were retaken, using a combination of film and digital cameras. During the winter of 2010, the photo point images were analyzed to determine whether a significant difference exists in recovery between stewarded and nonstewarded peaks. This represents the first attempt to carry out quantitative analysis on the photo point images.

**Figure 6—Summit steward Lynn Metcalf compares the view in front of her with a print of an earlier photo point to properly line up the image. Photo courtesy of the AHPSSP.**

A goal in the analysis was to use a method that could yield relevant results without the use of specialized software or statistical tools in the hope that such a method could be employed by other stewardship programs. Images were digitized and imported into the GNU Image Manipulation Program. Each image was aligned with the baseline photo, using a combination of foreground and background features as reference points. Once images were aligned, a grid was superimposed. In each grid square, percent photo cover was estimated in each of three coverage classes: bare rock, exposed soil, and vegetation. The process was repeated for each retake image in the series. Values were averaged, providing a single figure for each year in each of the three coverage classes.

In order to assess whether a significant difference existed in recovery from human trampling in stewarded versus nonstewarded alpine areas, percent change in photo cover over time was examined in all three coverage classes. Recovery in this case was defined as either an increase in percent vegetation or as a decrease in percent bare rock. Increased vegetation directly demonstrates recovery from trampling, whereas decreased bare rock suggests that rock has been replaced either with soil or with vegetation.

A significant difference was found in vegetation change on stewarded versus nonstewarded summits and in change in bare rock. Thus, this analysis of the photo point monitoring project suggests that the AHPSSP is having a measurable positive impact on recovery

**Figure 7—Mt. Marcy, left image from 1992, right image from 1999. Note the increase in vegetation between early and later images. Photo courtesy of the AHPSSP.**

**Figure 8—Wright Peak, left image from 1964, right image from 1999. Note the loss of soil and vegetation between early and later images. Photo courtesy of the AHPSSP.**

in the Adirondack alpine zone (see figures 7, 8, 9). These findings are preliminary and represent an avenue for further study. Comparison of the results yielded with this simplified technique and those obtained through more sophisticated analytical methods would better establish the precision and accuracy of this methodology.

Additionally, some images, particularly those with landscape features in the background, seem to show advancing tree line or tree height between the baseline images from the 1960s and the 2009 images. We intend to survey the literature and consider the feasibility of an additional analysis to determine whether we are seeing evidence of advancing tree line, potentially related to global climate change. For this work, photo point images may be used in conjunction with other historic photographs, both from Dr. Ketchledge's and other collections.

Nevertheless, these results are intriguing and have already influenced future directions of the AHPSSP. Photo points from nonstewarded peaks clearly demonstrate continued loss of soil and vegetation in the alpine zone. Thanks to an expanded volunteer program, we are able to place summit stewards on some of those peaks, such as Cascade Mountain, which have not traditionally had a steward presence, while maintaining coverage on peaks such as Marcy and Algonquin. Thus, this relatively simple photo point monitoring project has influenced management decisions in the Adirondack alpine zone.

The AHPSSP protects New York's alpine zone through a combination of backcountry education, conservation projects, and research. The program relies on a successful partnership of nonprofit organizations and a state agency to do its work. With all of our projects, education, conservation, and research, we rely on the goodwill of hikers and the help of volunteers. This has been the consistent theme of the Summit Steward program since its very beginning—individuals make all the difference in preserving this fragile ecosystem for the next 10,000 years.

## References


Slack, Nancy G., and Allison W. Bell. 1995. *Appalachian Mountain Club: Field Guide to the New England Alpine Summits*. Boston: Appalachian Mountain Club.

Slack, Nancy G., and Allison W. Bell. 2006. *Adirondack Alpine Summits: An Ecological Field Guide*. Lake George, NY: Adirondack Mountain Club.

Young, Stephen M., and Troy W. Weldy. 2006. New York rare plant status list. Albany, NY: New York Natural Heritage Program.

Zwinger, Ann H., and Beatrice E. Willard. 1972. *Land Above the Trees: A Guide to American Alpine Tundra*. New York: Harper & Row.



JULIA GOREN is the summit steward coordinator for the Adirondack High Peaks Summit Steward Program; email: summit@adk.org.


**Figure 9—Mt. Marcy, upper left 1981, upper right, 1999, below 2008. Note continued vegetation regrowth. Photo courtesy of the AHPSSP.**

# Governance Challenges for Wildland Preservation in Canada and Mexico

BY ANGELES MENDOZA SAMMET and MICHAEL S. QUINN

***Abstract***: The proposed Castle Wilderness (Canada) and the Monarch Butterfly Biosphere Reserve (Mexico) are used to demonstrate the application of a pluridimensional spectrum of governance framework to evaluate the influence of governance on the establishment and management of protected areas. The objectives are to understand (a) the relevant similarities and differences between the two countries, (b) the interactions across governance dimensions, and (c) the factors that influence conservation outcomes. The analysis shows that in both cases protected area governance is affected negatively by weak environmental and economic governance. Public support, funding, and improvements in protected area governance do not deliver positive conservation outcomes because of apparent inconsistencies among economic and conservation policies.

## Introduction

The conservation of wildlands in North America is crucial for maintaining ecological processes such as transboundary migration of wildlife, ecological connectivity, and hydrological regimes. In 2009, Mexico, Canada, and the United States signed a Memorandum of Understanding on Cooperation for Wilderness Conservation (Martin 2010). One identified topic of mutual interest is the "establishment of sustained relationships between wilderness managers across the continent for the purpose of mentoring, sharing research and technology, exploring common challenges and solutions, and potentially developing transcontinental goals and plans of action." We discuss increasing the transcontinental understanding of the role of governance in wilderness protection in Canada and Mexico.

Wildlands not geographically adjacent may still constitute complementary habitats for migratory species and contribute to the preservation of biodiversity at multiple geographical scales. For instance, Canada and Mexico are connected ecologically through a web of interactions among species and habitats despite the lack of a shared border. The success of national and international conservation efforts may be positively or negatively influenced by the way political, economic, and administrative authority is exercised in a country (e.g., United Nations Development Program [UNDP]1997).

Angeles Mendoza Sammet.

Michael S. Quinn.

Governance is reflected in the social, economic, environmental, and political conditions of a country. It results from, and depends on, the processes, institutions, regulations, and interactions that determine how groups and individuals behave and relate to each other. Governance is also related to (a) the way citizens and governments express

PEER REVIEWED

their interests, exercise their rights and obligations, and solve their disagreements; and (b) the way resources are allocated and managed to respond to collective needs. Finally, governance also implies accountability for consistent, cohesive polices, processes, and decision rights (UNDP 1997; World Bank Group [WBG] 2003).

The management and governance challenges faced in the fields of natural resources and protected areas (PAs) have been described in the literature (e.g., Graham et al. 2003 and Dearden et al. 2005). Such discussions focused mainly on the different styles of management and/or ownership, for instance private, comanagement, or public. Effective management of wildlands and PAs in Canada and Mexico is needed to ensure the survival of migratory species and native biodiversity. Established protected areas may exemplify wilderness conditions, but may not be formally designated as wilderness.

Wilderness Areas (category Ib within the World Conservation Union [IUCN] system) are different and independent from National Parks (Category II, IUCN 2009). The national systems of protected areas of Canada and Mexico have national parks as a federal category but neither has wilderness areas as an independent category. In Canada, wilderness areas are federally designated as a zone within national parks: "The Governor in Council may, by regulation, declare any area of a park that exists in a natural state or that is capable of returning to a natural state to be a wilderness area" (Canada National Parks Act 14[1], Government of Canada [GC] 2000). One national park reserve (Nahanni) and seven national parks contain wilderness areas: Banff, Jasper, Kootenay, Yoho, Waterton Lakes, Fundy, and Vuntut (GC 2009). In addition, six provinces have wilderness areas or wilderness parks (Dawson and Hendee 2009). It is expected that the Mexican government will take action to protect wilderness. To this date, however, neither the Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT) nor the Comisión Nacional de Àreas Naturales Protegidas (CONANP) have announced the introduction of wilderness areas in protected areas legislation either as a new category or in other ways. In 2005, Maderas del Carmen (Mexico) was announced as the first wilderness area in Latin America (Conservation International 2005); however, in 2010 it is still listed as an Area for Protection of Flora and Fauna (CONANP 2010), a designation that offers a lower level of protection. Its management plan (Secretaría de Medio Ambiente, Recursos Naturales y Pesca 1997) considers four zones. The plan allows grazing and forestry in the zones of Restoration and Use of Natural Resources, which together cover more than half of the protected areas. The Wild Zone is the most preserved. The Natural Outstanding Zone shows evidence of use of natural resources and of natural regeneration.

What governance factors influence wilderness conservation? Our primary purpose here is to demonstrate a framework to identify key factors of influence by analyzing the role of governance in establishing and managing PAs. By comparing the Monarch Butterfly Biosphere Reserve (Mexico) and the proposed Castle Wilderness (Canada), we show: (a) the different actors involved, (b) the types of governance associated with those actors, and (c) the similarities and differences between the two countries.

## Methodology

A case study method demonstrates the utility of a framework for governance analysis to examine the challenges associated with establishing PAs. We assumed that the chosen case studies, one from each country, embody critical characteristics of wilderness. Although they differ significantly in history, ecology, and socioeconomic context, their contrast provides a valuable demonstration of the framework.

## Document Review

The majority of information was obtained from official documents available on the Internet. The web pages consulted for Mexico included the Official Diary of the Federation (Diario Official de la Federación), and the Secretariat of the Environment and Natural Resources (Secretaría del Medio Ambiente y Recursos Naturales SEMARNAT). The documents included those available at the Monarch Log (SEMARNAT 2008). Web pages for Canada included those from the Castle-Crown Wilderness Coalition, the Sierra Club of Canada, and the Government of Alberta. Additional information included the environmental impact assessment for a ski resort expansion (Vacation Alberta Corporartion [VAC] 1992), court decisions, and notes taken by one of the authors (Mendoza) during the court hearing on November 23, 2003. Both cases were complemented with journal articles, press releases, and articles from newspapers and environmental newsletters. A chronology of events was constructed for each case to get a relation of events and actors involved (Mendoza 2010).

## A Pluridimensional View of Governance

Mendoza and Thompson (2005) analyzed the influence of governance on PAs using three dimensions of governance:

1. Economic governance: Governmental and self-imposed rules guiding a business's operation and behavior toward other businesses,

society, and the environment.

2. Environmental-regulatory: Policy and rules set by a government for environmental protection.
3. Protected area governance: Policy and practices guiding management of PAs and staff attributions.

In this work we add two dimensions:

4. Social governance: Written and unwritten policies and rules guiding the participation of different stakeholders in policy design, decision making, and implementation (including conservation and park management).
5. Intellectual governance: Written and unwritten laws, regulations, codes, and other formal or informal agreements determining how data, information, and knowledge are generated, owned, shared, and used by groups or individuals. This includes popular, scientific, community, and traditional indigenous knowledge.

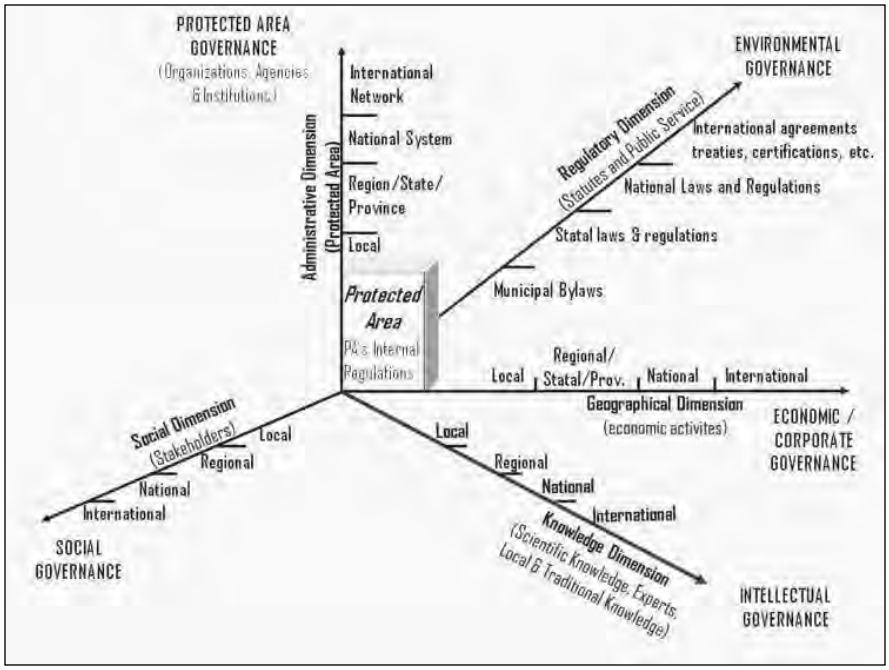



**Figure 1—Five dimensions of governance that influence the achievement of conservation goals. The interactions among actors across dimensions and levels (internal to international) are used to identify the most influential factors (positive or negative).**

The result is the pluridimensional model of governance (see figure 1). We define pluridimensional governance as the combined influence that different types of governance, acting simultaneously at various spatial and temporal scales, have on the achievement of planned outcomes. It is different from multilevel governance, a term used in the European Union (EU) to refer to governance acting across levels of government (e.g., EU parliament to municipal government; Organisation for Economic Co-Operation and Development 2009). In the pluridimensional model, multilevel governance corresponds to one dimension such as regulatory/environmental governance.

## Actors, Interactions, and Factors

Each governance dimension has associated actors and factors at different spatial and temporal levels. Here we only use spatial levels: international, national, state or provincial, local, and internal/park. Theoretically, the interactions among actors are regulated by the political structures (laws and regulations) set by a country and international agreements. The factors, such as group interests, statutes, activism, and codes of conduct, work as driving forces, neutral forces, or barriers. Some actors may not apply to a particular situation, their influence may not be known, or they may have dual influence; the last one usually indicates poor quality of governance.

## Results

### *Protected Areas in Canada and Mexico*

Canada exemplifies a developed country with relatively stable governance. Mexico exemplifies a developing country with governance challenges. Although PAs originated in both countries in the same period, the corresponding park agencies and legislation did not. In 1876, a presidential decree established Desierto de los Leones as the first Mexican protected area. In 1887, the Rocky Mountains Park Act declared Banff (then Rocky Mountain) as the first Canadian national park (McNeely et al. 1994). In Canada, the Dominion Forest Reserves and Parks Act of 1911 set the basis for managing PAs and created the world's first modern park management agency, the Dominion Parks Branch, which later became Parks Canada (Dearden and Rollins 2002; McNeely et al. 1994). In Mexico, the General Law of the Environment and Environmental Protection of 1988 (Ley General del Equilibrio Ecológico y Protección al Ambiente ) was the first law that set clear objectives for PAs. PAs were passed from one secretariat to another from 1876 until 2000, when the National Commission for Natural PAs (CONANP) was cre-

ated (Mendoza and Thompson 2005). Both countries have the capacity to designate protected areas at the state or provincial level.

The efforts to protect the proposed Castle Wilderness and the forested areas that constitute Monarch show the challenges faced by society to protect habitats and the species that depend on them. Space limitations dictate that we only highlight some of the key factors arising from the case studies. For additional information about the case studies and interactions, please see Mendoza (2010).

**Figure 2—Eastern approach to the Castle Special Management Area Forest Land Use Zone. Photo © by Michael Quinn.**

## Castle Wilderness

The Castle Wilderness (CW) is a region of forested land along the eastern slopes of the Rocky Mountains (southwestern Alberta, Canada) (see figure 2). In 1914, the area was designated as part of Waterton Lakes National Park. Its level of protection was subsequently lowered to a game reserve in 1921 when its lands were transferred to the province of Alberta. In 1954, it lost its protected status and became public multiple-use land. Since 1958, wilderness advocates have been actively seeking formal protection of this landscape as wilderness. In 1994, Alberta's Natural Resource Conservation Board (NRCB) recommended establishing a PA in the CW after reviewing the environmental impact assessment statement (VAC 1992) for a proposed expansion of a downhill ski resort within the CW region. To date, no strictly protected designation has been established and wilderness advocates continue to pursue its protection. It is currently designated as the Castle Special Management Area Forest Land Use Zone, a category of public land established for multiple use, including recreation and industrial resource extraction. Continuing debates on the use and designation of the area provide an ideal context to examine the role of governance in PA establishment.

Thirty-two actors were identified, most of them at the local and state/provincial levels (see figure 3). Twelve of the 27 interactions identified among actors had a positive influence. The social and environmental/regulatory dimensions account for more than half of the actors (nine actors each).

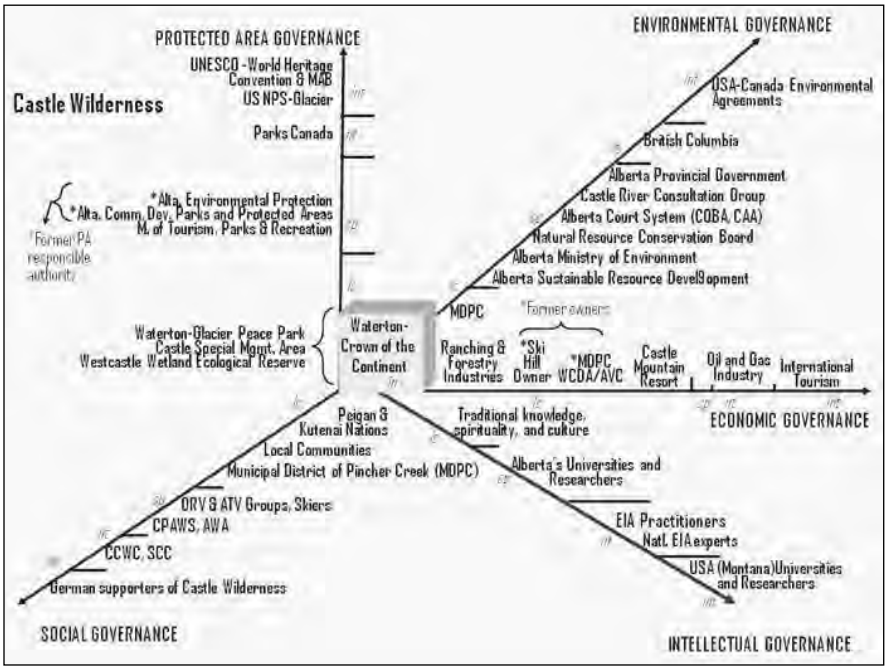



**Figure 3—Actors involved in the CW Case: CQBA = Court of Queen's Bench of Alberta; CA = Court of Appeals of Alberta; MDPC = Municipal District of Pincher Creek; WCDA = Westcastle Development Authority; AVC = Alberta Vacation Corporation; CPAWS = Canadian Parks and Wilderness Society; WA = Alberta Wilderness Society; SCC = Sierra Club of Canada; CCWC = Castle-Crown Wilderness Coalition; ORV = off-road vehicles; ATV = all-terrain vehicles.**

## Monarch Butterfly Biosphere Reserve

The Monarch Butterfly Biosphere Reserve (MBBR) is a region with relict mountaintop forest patches of Oyamel fir (*Abies religiosa*) located in central Mexico. Between 1971 and 1986, the wintering areas of monarch butterfly (*Danaus plexippus*) were discovered in Oyamel fir patches scattered over the states of Mexico and Michoacán (Bower 1995). The land belongs to indigenous communities and *ejidos* (farming communal lands) whose main activity is forestry (see figure 4). In 1980, MBBR was decreed a Reserve and Wildlife Zone; in 1986, a Special Biosphere Reserve; and in 2000, a Biosphere Reserve. In 2009, a new decree modified one of the three core zones. The core zones, scattered on the two states, cover approximately 24% of MBBR's surface. The rest is declared as a buffer (Gobierno de México 2009). Degradation of MBBR due to legal and illegal activities increased after 2000. This happened despite the establishment of the Monarch Conservation Fund (Missrie and Nelson 2005) and collaboration with Canada and the United States (Fox 2006; Trilateral Committee for Wildlife and Ecosystem Conservation and Management [TCWECM] 1997). MBBR provides a relevant context to examine the role of governance in the establishment and management of PAs.

Forty-four actors were identified in this case (see figure 5), most of them along the environmental/regulatory dimension. Six of the 40 interactions across actors had a positive influence. The influence of three recent interactions is still unknown. International actors dominate in the intellectual dimension.

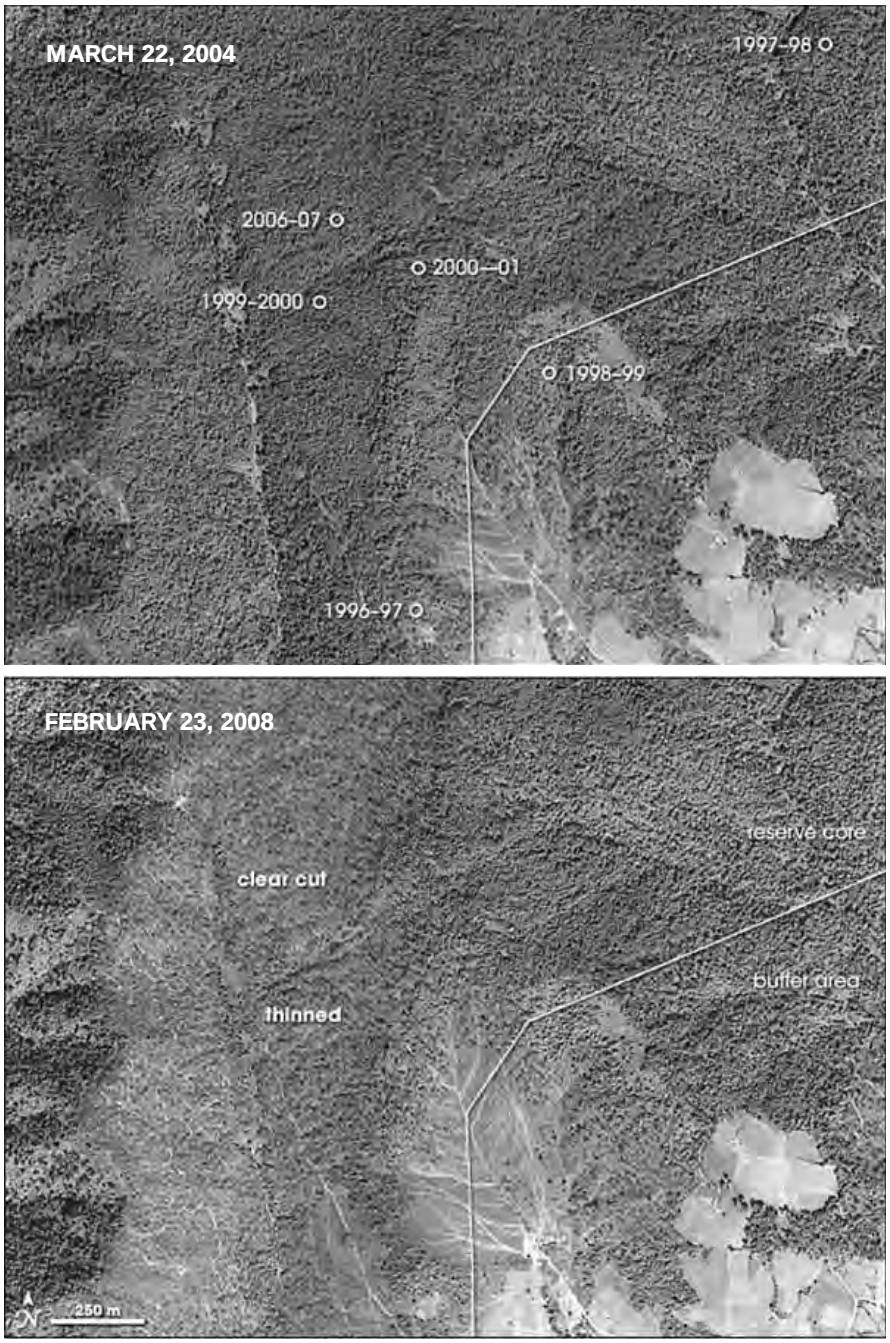



**Figure 4—Deforestation at MBBR, 2004–2008. Photo courtesy of GeoEye satellite image; www.geoeye.com.**

## Protected Area (PA) Governance

In a study of global trends in PA governance, Dearden et al. (2005) identified the need for secure funding, capacity building, and community involvement. We expected those factors to be influential in Mexico, a developing country. However, our pluridimensional analysis identified poor economic and environmental governance as the primary factors hindering the successful creation of both PAs. The principal actors concentrate at local and provincial levels for CW, whereas in MBBR there is a mix from local to international actors.

In both cases, jurisdictional authority for the lands has changed over time. This affected conservation

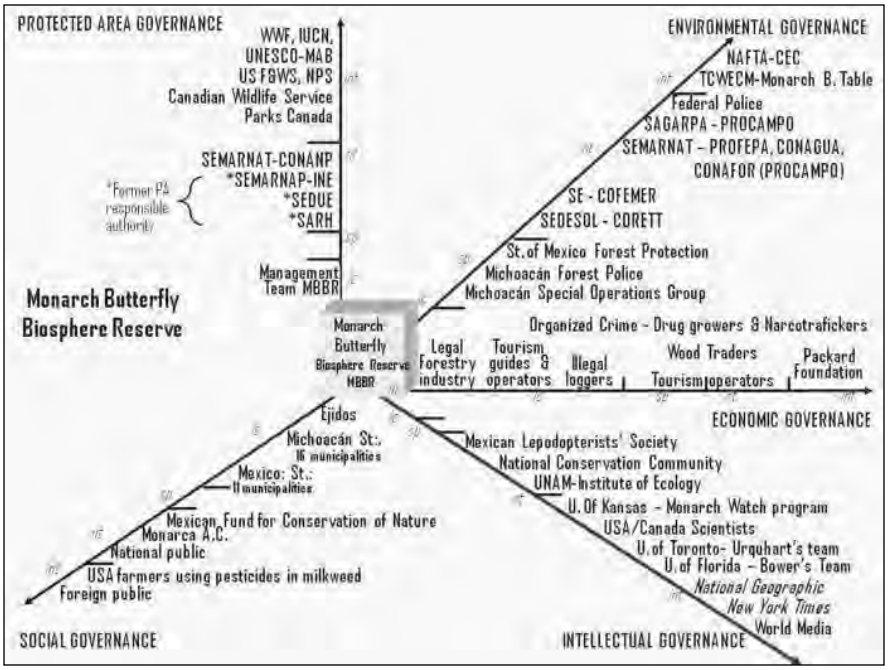



**Figure 5. Actors in the MBBR case: CEC = Commission for Environmental Cooperation; COFEMER = Comisión Federal de Mejora Regulatoria; CONAFOR = Comisión Nacional Forestal; CONAGUA = Comisión Nacional del Agua; CONANP = Comisión Nacional de Áreas Naturales Protegidas; CORETT = Comisión para la Regularización de la Tenencia de la Tierra; INE = Instituto Nacional de Ecología; NAFTA = North American Free Trade Agreement; PROFEPA = Procuraduría Federal de Protección al Ambiente; SAGARPA = Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación; SARH = Secretaria de Agricultura y Recursos Hidráulicos; SE = Secretaria de Economía; SEDESOL = Secretaría de Desarrollo Social; SEDUE = Secretaría de Desarrollo Urbano y Ecología; SEMARNAP = Secretaría de Medio Ambiente, Recursos Naturales y Pesca; SEMARNAT = Secretaría de Medio Ambiente y Recursos Naturales; TCWECM = Trilateral Trilateral Committee for Wildlife and Ecosystem Conservation and Management; U = University; UNAM = Universidad Nacional Autónoma de México; US F&WS = US Fish and Wildlife Service; NPS = U.S. National Park Service.**

negatively through lack of continuity in PA policy. The transfer of the CW lands from national park protection to provincial multiple use was particularly detrimental. The CW is currently under the jurisdiction of Alberta Ministry of Sustainable Resource Development, but would transfer to the Ministry of Tourism, Parks and Recreation if Provincial PA designation were to be achieved (Government of Alberta [GA] 2009). Two positive changes in Mexico were creating CONANP in 2000 and giving it the administration of funds for community sustainable development programs. However, CONANP is still subordinated to SEMARNAT in matters of land use, environmental policy, and enforcement.

## Social Governance

The work of conservation groups is the main factor supporting conservation in both cases. The Castle-Crown Wilderness Coalition (CCWC) and a cadre of related environmental organizations are pursuing the NRCB recommendation to protect the CW as the Andy Russell-I'tai sah kòp Wildland Provincial Park. The coalition of environmental groups has received international support for the request. Most social actors support protecting the CW. The opposition comes from groups of snowmobile and other motorized recreationists not keen on restricting motorized vehicles in the wilderness (Houghtaling 2009). Local communities support the protection of MBBR. Still, part of the population participates in illegal activities because of economic alternatives (Merino Pérez and Hernández Apolinar 2004; Consejo Civil Mexicano para la Silvicultura Sostenible [CCMSS] 2007; Lazaroff 2002).

## Intellectual Governance

The existence of traditional and scientific knowledge (provincial and international) supports protection of the wilderness and provides it with additional cultural and spiritual values. Contrary to what might be expected, the Environmental Impact Assessment (VAC 1992) conducted for a proposed ski hill expansion had little positive influence due to the disregard for the potential impacts that the expansion would have on aquatic ecosystems and of the regional cumulative effects. Despite that, the NRCB was able to determine the significance of the potential impacts on the regional ecosystem and recommend the protection of the CW (Court of Appeal of Alberta 2005). Traditional knowledge and cultural values are weak in MBBR. International actors dominate, having dual influence. On the negative side, the scientific community has been divided with controversial delays in publishing some research findings (e.g., Brower 1995). On the positive side, most research on the monarch butterfly has been by U.S. and Canadian scientists, but with little collaboration between Mexican and international scientists to provide a solid strategy to protect habitat along the butterfly's migratory range.

## Economic Governance

In both cases, economic actors are present from local to international levels. The CW has been significantly degraded by an economic policy based on energy/oil and gas production and forest exploitation (Alberta Wilderness Association [AWA] 2007; Sierra Club

of Canada 2009). Nevertheless, the petroleum and forest industries supported its protection as a special place (Hryciuk and Struzik 1999). Because of the NRCB ruling, expanding the resort incrementally through municipal approvals suggests poor environmental governance by the regulator and poor corporate governance and social responsibility by the ski resort operator.

The major threat for MBBR is the loss of fir forest, which has accelerated with every decree (Brower 1995) and despite the creation of the Monarch Fund (World Wildlife Fund 2006). Illegal logging led by criminal groups supplies more wood to the market than legal forestry (CCMSS 2007; United Nations Environment Programme [UNEP] 2008). Clearing for agriculture, grazing, or urbanization represents 80% of forest loss in Michoacán (Osorio 2007). This results from much higher subsidies for agriculture than for forestry, subsidies to inefficient agricultural and forestry programs, excessive regulation to access development funds or harvest permits, corruption, and poor control of forest permits (CCMSS 2007; Osorio 2007; Agren 2009). The interest of social actors to exploit natural resources is a negative influence in both cases. However, it is likely that such influence would not be significant if there were strong environmental governance.

## Environmental Governance

The effect of land tenure on conservation of wilderness is highly complex. The CW was part of Waterton Lakes National Park in 1914 but was removed from Waterton and transferred to the province in 1921. It was a Provincial Game Reserve from 1921 to 1954. Calls to protect it again started in 1958 (AWA 2007). Calls for formal establishment of a PA arising from the NRCB decision in 1994 were unrealized due to disagreements among the actors (Court of Queen's Bench of Alberta [CQBA] 2004). The CW was subsequently proposed for protection under the "special place" program however, the program concluded in 2001 (GA 2009) and discussions regarding protected area designation remain unresolved (Houghtaling 2009). The removal of protection for CW apparently is a local/regional decision, but it has repercussions at provincial, national, and international levels. As part of the Crown of the Continent Ecosystem, which includes the Waterton-Glacier International Peace Park World Heritage Site, its protection is crucial to maintain the ecological integrity of Waterton, the smallest of Canada's Rocky Mountain Parks (Parks Canada 2008). In addition, failure to come to resolution on a protected area has resulted in a loss of trust toward the government from industry representatives and conservation groups. Governance issues contributing to the failure of protected area establishment include not setting standards for protection of special places (Francis n.d.), failing to set priorities for land use, and refusing to consider trade-offs for conservation suggested by the industry, such as land swaps, lease credits, or outright cash settlements (Hryciuk and Struzik 1999).

Despite having four decrees, MBBR is still a "paper park." The lack of compensation to communities and *ejidos* affected by its creation is one of the causes of illegal land use within it (CCMSS 2007; Merino Pérez and Hernandez Apolinar 2004). The Monarch Fund was created to help communities in the MBBR move to a conservation-based economy. However, it has not been successful because of corruption in government at different levels (Martínez Elorriaga 2007), institutional complexity, excessive regulation to access funds, and lack of integration of social goals into conservation policy (Missrie and Nelson 2005; CCMSS 2007). The area is under control of criminal gangs that use heavy weaponry to subdue the forest patrols and discourage local population from protecting the forest (Grillo 2005). Foreign PA and wildlife authorities represent international concern for the destruction of MBBR. Other major threats for MBBR derive from poor environmental-regulatory governance (Martinez Elorriaga 2007; UNEP 2008).

## International Collaboration

The discussion for the CW presented above focused on the Canadian side; however, its regional ecosystem includes the Waterton-Glacier International Peace Park World Heritage Site. The regional ecosystem is threatened by development and industrial activities in Alberta, British Columbia, and the United States. Both countries have agreements for maintaining air quality and protecting migratory species, for instance, the North American Waterfowl Management Plan. Yet such agreements do not seem to help protect the CW. The discussion for MBBR focused on Mexico; however, the monarch butterfly is also threatened by loss of habitat and pesticide use in the United States (Brower 1995). Conservation of the monarch butterfly has been a priority for trilateral collaboration at least since 1997 (TCWECM 1997). Not much has been achieved to date despite memorandums of understanding and informal agreements such as the Trilateral Committee for Wildlife and Ecosystem Conservation and Management (TCWECM 1997) and the Trilateral Monarch Butterfly Sister Protected Area Network (Fox 2006).

The implications of a new Memorandum of Understanding on Cooperation for Wilderness Conservation between Mexico, the United States, and Canada, signed at WILD 9 in Mérida, Mexico (November 2009), remain unclear, but promising.

Another factor is the lack of influence that international agreements had at the local level to produce tangible conservation outcomes, despite their positive influence in national environmental policy. This may result from the voluntary nature of many conservation agreements and the consequent lack of accountability (Mendoza 2010). This pluridimensional analysis shows the need to work from local to international levels to effectively protect wilderness. Perhaps it is time to set higher priorities for regional conservation and introduce more accountability for conservation outcomes in North America. Further research could analyze mechanisms to do so through the Commission for Environmental Cooperation or the TCWECM.

## Conclusion

The pluridimensional analysis of governance for the CW and MBBR provides a more detailed picture to target factors that influence protected areas and conservation success than simply looking at protected areas governance alone. It shows that successful conservation outcomes are hindered by deficiencies in environmental/regulatory governance, especially the inconsistency between the economic and conservation policy set by the respective governments and their lack of leadership. Both case studies have had federal protection, although today CW is under provincial government jurisdiction and MBBR is under federal jurisdiction. Both cases showed governance limitations in three aspects: implementing conservation policy, setting priorities for land use, and solving conflicts among actors. In the case of the CW, poor environmental governance resulted in lost opportunities to protect the wilderness and loss of trust of economic and social actors on the ability of the provincial government to create the conditions to reconcile economic and conservation interests. In the case of the MBBR, poor environmental governance combined with poor economic governance resulted in loss of productive alternatives for the communities that used to make a living from forestry before the reserve was decreed. This situation favored criminal gangs who took advantage of the lack of vigilance on protected sites and deficiencies in the control of forest industry to dominate the market commercializing wood harvested illegally by unemployed people.

Protection of the CW may improve if it can be designated as a provincial park. It is still uncertain how the new decree will work for the MBBR. Nevertheless, both cases show that improvements in PA governance can do little in absence of good environmental and economic governance. The Commission for Environmental Cooperation could be a starting point to introduce accountability mechanisms for conservation outcomes in North America.

## Acknowledgment

A version of this paper was presented at the Symposium on Science and Stewardship to Protect and Sustain Wilderness Values: 9th World Wilderness Congress; November 6–13, 2009, Mérida, Mexico.

## References

Agren, David. 2009. Mexico: Why massive tree planting promises come to naught. *Forest Policy Research*, February 4. Retrieved on December 3, 2009, from forestpolicyresearch.org/2009/02/05/mexico-why-massive-tree-planting-promises-come-to-naught.

Alberta Wilderness Association. 2007. Castle Wilderness, November 23. Retrieved on November 29, 2007, from issues.albertawilderness.ca/CW/history.htm.

Brower, Lincoln P. 1995. Understanding and misunderstanding the migration of the monarch butterfly (*Nymphalidae*) in North America: 1857–1995. *Journal of the Lepidopterists' Society* 49(4): 304–85.

Castle Crown Wilderness Coalition. 2008. Andy Russell–I'tai sah kòp Park brochure. Retrieved on November 30, 2009, from www.ccwc.ab.ca/files/proposedpark.pdf.

Comisión Nacional de Áreas Naturales Protegidas. 2010. Programas de Manejo. Retrieved on March 28, 2010, from www.conanp.gob.mx/que_hacemos/programa_manejo.php.

Consejo Civil Mexicano para la Silvicultura Sostenible. 2007. El combate a la tala ilegal en México. Nota informativa no. 15, Junio. Retrieved on December 14, 2009, from www.ccmss.org.mx/.

Conservation International. 2005. El Carmen—The first wilderness designation in Latin America. Retrieved on March 27, 2010, from www.conservation.org/sites/celb/news/Pages/100105_el_carmen.aspx.

Court of Appeal of Alberta. 2005. Castle-Crown Wilderness Coalition v. Alberta (Director of Regulatory Assurance Division, Alberta Environment), ABCA 283. Date: 20050909. Retrieved on November 29, 2007, from www2.albertacourts.ab.ca/Home/JudgmentsfromAllCourts/t.

Court of Queen's Bench of Alberta. 2004. Castle-Crown Wilderness Coalition v. Flett, ABQB 515. Date: 20040702. Retrieved on November 29, 2007, from www2.albertacourts.ab.ca/Home/JudgmentsfromAllCourts/t.

Dawson, C. P., and J. C. Hendee. 2009. *Wilderness Management: Stewardship and Protection of Resources and Values*, 4th ed. Golden, CO: Fulcrum Publishing.

Dearden, P., and R. Rollins, R. 2002. *Parks and Protected Areas in Canada: Planning and Management*, 2nd ed. Toronto: Oxford University Press.

Dearden, Philip, Michelle Bennet, and Jim Johnston. 2005. Trends in protected area governance, 1992–2002. *Environmental Management* 36(1): 89–100.

Fox, Maggie. 2006. Canada, Mexico, U.S. agree to protect butterflies. Reuters, July 6. Retrieved on November 30, 2009, from www.enn.org.

Francis, Wendy. N.d. Alberta's special places program: A triumph of politics over science. Retrieved on December 14, 2009, from raysweb-net_sp2000_

francis_index-html_piug5qir.pdf.
Government of Alberta, Tourism, Parks and Recreation (2009). About Alberta's parks. Retrieved on October 17, 2009, from tpr.alberta.ca/parks/managing/establishing.asp.
Government of Canada. 2000. Canada National Parks Act 2000, c. 32.
———. 2009. Regulations amending the National Parks Wilderness Area Declaration Regulations. SO R/2009-99 March 26, 2009. *Canada Gazette* Part II, 143(8) (April 15, 2009).
Gobierno de México. 2009. Decreto que modifica el Artículo Primero del diverso por el que se declaró como Área Natural Protegida, con la categoría de Reserva de la Biosfera, la región denominada Mariposa Monarca, ubicada en los Municipios de Temascalcingo, San Felipe del Progreso, Donato Guerra y Villa de Allende en el Estado de México y Contepec, Senguio, Angangueo, Ocampo, Zitácuaro y Aporo en el Estado de Michoacán, publicado el 10 de noviembre de 2000. *Diario Oficial de la Federación*, November 3, 2009.
Graham, J., B. Amos, and T. Plumptre. 2003. Governance principles for protected areas in the 21st century. Ottawa, Ontario, Canada: Parks Canada, and Canadian International Development Agency, Institute on Governance.
Grillo, Ian. 2005. Mexican park rangers defend monarch butterflies from loggers. Associated Press, December 19. Retrieved on June 15, 2007, from www.enn.com/wildlife/article/12304.
Houghtaling, Debbie. 2009. Close vote on Castle Special Place. *Pincher Creek Echo*, November 26. Retrieved on December 15, 2009, from www.pinchercreekecho.com/ArticleDisplay.aspx?e=2192941.
Hryciuk, Dennis, and Ed Struzik. 1999. Is it too late to save our special places? *The Edmonton Journal*, February 15. Retrieved on December 14, 2009, from raysweb.net/sp2000-ej/pages/introduction.html.
International Union for Conservation of Nature. 2009. Categories system for protected areas task force. Retrieved on November 10, 2009, from www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories/.
Lazaroff, Cat. 2002. Timber harvest destroying Mexican butterfly forest. Retrieved on April 4, 2002, from www.ens-newswire.com/ens/apr2002/2002-04-03-06.asp.
Martin, Vance G. 2010. The 9th World Wilderness Congress, Mexico, 2009. *International Journal of Wilderness* 16(1): 37–42.
Martinez Elorriaga, Ernesto. 2007. Indagan desvío de recursos en reserva de la mariposa monarca. *La Jornada*, March 15. Retrieved on December 15, 2009, from www.jornada.unam.mx/2007/03/15/index.php?section=estados&article=040n3est.
McNeely, J. A., J. Harrison, and P. Dingwall. 1994. Protecting nature: Regional views of protected areas. IV World Congress on National Parks and Protected Areas, Caracas, Venezuela. Gland, Switzerland, and Cambridge, UK: IUCN. .
Mendoza, Angeles. 2010. Enhancing management of protected areas. Ph.D. thesis, Faculty of Environmental Design, University of Calgary, Alberta, Canada.
Mendoza D. A., and D. Thompson. 2005. Governance for protected areas in Mexico and Canada. In *Towards Better Regulation, Governance and Accountability: Global Perspectives from Corporations and Civil Society*, ed. I. Demirag (pp. 198–215). Geenleaf, UK: Greenleaf Publishing.
Merino Pérez, Leticia, and Mariana Hernández Apolinar. 2004. Destrucción de instituciones comunitarias y deterioro de los bosques en la Reserva de la Biosfera Mariposa Monarca, Michoacán, México. *Revista Mexicana de Sociología* 66(2): 261–309.
Missrie, Mónica, and Kristen Nelson. 2005. Direct payments for conservation: Lessons from the Monarch Butterfly Conservation Fund. Research Summary/Paper No. 8, April. University of Minnesota, College of Natural Resources. St. Paul, MN..
Organisation for Economic Co-Operation and Development. 2009. Multi-level governance: Directorate for public governance and territorial development. Retrieved on April 6, 2009, from www.oecd.org/document/11/0,3343,en_2649_34413_36877643_1_1_1_1,00.html.
Osorio, Victor. 2007. Talan bosques por Agro. *Reforma*, June 25. Retrieved on December 3, 2009, from www.ccmss.org.mx/modulos/noticias_consultar.php?folio=173.
Parks Canada. 2008. Waterton Lakes National Park of Canada: State of the park report. Retrieved on January 21, 2010, from www.pc.gc.ca/eng/pn-np/ab/waterton/plan.aspx.
Secretaría de Medio Ambiente, Recursos Naturales y Pesca. 1997. Programa de Manejo del Área de Protección de Flora y Fauna Maderas del Carmen, México. D.F. México: Instituto Nacional de Ecología, SEMARNAT.
SEMARNAT. 2008. Bitácora Ambiental Mariposa Monarca. Dirección General de Política Ambiental e Integración Regional y Sectorial. Retrieved on December 13, 2009, from www.semarnat.gob.mx/queessemarnat/politica_ambiental/ordenamientoecologico/Pages/bitacora_monarca.asp.
Sierra Club of Canada, Chinook Group. 2009. Castle Wilderness. Retrieved on July 8, 2009, from www.sierraclubchinook.org/Castle/CastleWilderness.html.
Trilateral Committee for Wildlife and Ecosystem Conservation and Management. 1997. II Meeting. Table 12 monarch butterfly conservation working table. Retrieved September 8, 2002, from www.trilat.org/defunct_tables/mon_butterfly/II_meeting_mon_butterfly_eng.htm.
United Nations Development Program. 1997. Governance for sustainable human development: A UNDP policy document. Retrieved on May 20, 2004, from mirror.undp.org/magnet/policy/.
United Nations Environment Programme. 2008. Monarch Butterfly Biosphere Reserve, Mexico. World Heritage Sites, United Nations Environmental Programme–World Conservation Monitoring Centre. Retrieved on November 30, 2009, from www.unep-wcmc.org/sites/wh/pdf/Mexico%20Butterfly.pdf.
Vacation Alberta Corporation. 1992. Four-Season Resort EIA report, December 14. Calgary, Alberta, Canada: HBT AGRA.
World Bank Group. 2003. About governance: WBI themes. Retrieved on August 19, 2003, from www.worldbank.org/wbi/governance/about.html.
World Wildlife Fund. 2006. Forest loss and deterioration in the Monarch Butterfly Biosphere Reserve, 2005–2006. Report. Retrieved on December 10, 2009, from www.wwf.org.mx/wwfmex/descargas/0610_Informe_monarca0506_english.pdf.

ANGELES MENDOZA SAMMET is a Ph.D. candidate at the faculty of Environmental Design, University of Calgary, 2102, 12 Avenue NW Calgary, Alberta, Canada, T2N 4X1; SammySolution.com; phone: 403-210-2603; email: angeles@angelesmendoza.com.

MICHAEL S. QUINN is an associate professor in the faculty of Environmental Design, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada, T2N 1N4; phone: 403-220-7013; email: quinn@ucalgary.ca.

PERSPECTIVES FROM THE
ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

# Managing Fire in Wilderness

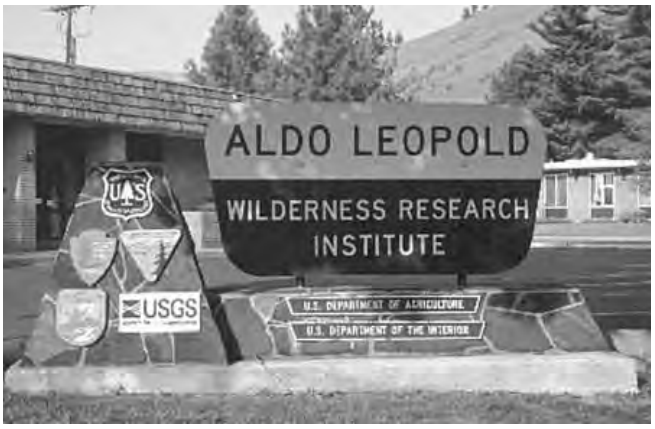
## *Reflections from WILD9*

DAVID J. PARSONS

My experiences in coordinating several sessions around the theme of Wildland Fire and Protected Areas at the 9th World Wilderness Congress (WILD9) provided a sharp reminder of just how different some of the principle challenges to wilderness stewardship are across the globe. Unlike the largely common approaches to issues such as biodiversity and habitat connectivity, the management of fire differs greatly among countries and cultures. These differences present unique challenges in communicating about and learning from experiences in other areas.

Held November 6 to 13, 2009, in Mérida, Mexico, WILD9 provided a variety of forums for scientists, managers, educators, and conservationists from around the world to address the myriad challenges to the protection and preservation of wilderness. Given the importance of the restoration and management of fire as a natural process in parks and wilderness areas of the United States and Canada, the Aldo Leopold Wilderness Research Institute organized two sessions of invited presentations within the Science and Stewardship Symposium at WILD9. In addition, a session of contributed papers and a workshop organized by the National Park Service provided a robust theme of wilderness fire that stretched over three days. It soon became evident that the diverse perspectives brought by the different cultures represented at the Congress presented some unique challenges. The bias of the session organizers (i.e., that fire is a natural process that should be perpetuated wherever possible) did not effectively translate to those parts of the world where fire is considered bad, something to be avoided.

In the introductory session, invited presentations provided brief historical overviews of the use and management




of fire in protected areas in Canada, the United States, Mexico, and the Caribbean and Central America, respectively. The emphasis in Canada and the United States on using fire as a tool to restore natural processes contrasted sharply with the focus on suppression of virtually all fires in Mexico and the rest of Latin America. In the larger protected areas of Canada and the United States, the principal aim of fire management is, wherever possible, to restore the roles of both lightning fires and ignitions by Native peoples. In these two countries, the primary challenges are (1) how to allow lightning fires to burn without threatening communities and other values that may exist within or adjacent to protected areas, and (2) whether and how to use management-ignited prescribed fires within such areas. In contrast, in Mexico, and most of the rest of Latin America, fire is considered almost universally to be harmful and is something to be avoided. Alfredo Nolasco, the national fire manager for the Mexican National Forest Commission emphasized the difficulty in changing the almost universal perception that all fire is bad. He noted that only recently has some progress been made in recognizing that some

ecosystems are actually dependent on fire. Most of the rest of Latin America continues to lack understanding of the beneficial aspects of fire, and thus views all fire as harmful. In many countries it is expressly against the law to set a fire, even within areas such as parks and wilderness, that have been designated to protect natural ecosystems.

The following WILD9 sessions included discussion of evidence that changing climates may already be extending the fire season and resulting in larger and hotter fires in many areas, the importance of understanding public perceptions of fire, the future challenges for the management of natural fire presented by increasing housing development near wilderness areas, and the complexity of understanding the effects of carbon emissions from fire and trade-offs with other protected wilderness objectives. In fact, an important area of agreement among countries and cultures was the need for expanded understanding and dialogue regarding the trade-offs associated with the effects of fire management decisions on carbon emissions, including how to weigh the costs and benefits of such consequences on local, regional, and global scales.

For those interested in the management of wilderness were the dramatic differences among countries and cultures in how fire is perceived, and thus managed.

Contributed papers at WILD9 addressed such various issues as visitor experiences following fire (Boundary Waters Canoe Area in Minnesota, USA), restoration of conifer forests using fire (Northern Rocky Mountains, USA), institutional collaboration in managing fire (Baja California, Mexico), effects of climate change on wildfires (Australia), and changing perceptions about wildfire (USA.). The National Park Service–led discussions provided background on the history and evolution of that agency's fire policy and programs as well as important dialogue on future challenges and opportunities related to the management of wildland fire in parks and wilderness.

In summary, perhaps the most important take-home message for those interested in the management of wilderness were the dramatic differences among countries and cultures in how fire is perceived, and thus managed. This was particularly clearly reflected in the translation of the description of the Congress's fire theme that appeared in the official WILD9 program. What the organizers proposed and described as a track of sessions on "Wildland Fire and Protected Areas" (English version of the program), was translated into the Spanish version of the program as "*control de incendios*" (control of wildfire), rather than "*manejo de fuego*" (management of fire). This difference in perception about the role and management of fire in wilderness reflects legal as well as cultural differences. It presents a challenge that must be considered in planning future international forums to discuss the topic of fire in protected areas.

DAVID J. PARSONS is the retired, past director of the Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station, USDA Forest Service; email: djparson02@fs.fed.us.

# Dr. David Parsons Retires

BY ALAN WATSON and GREG KROLL

Dr. David Parsons, former director of the Aldo Leopold Wilderness Research Institute (ALWRI), Missoula, Montana, retired from government service on New Year's Eve, 2009. A well-known ecologist with a focus on the natural role of fire in wilderness ecosystems, he became the first director of the ALWRI in 1994. In this position, he is credited with providing national leadership in a newly defined interagency context. The ALWRI, which is jointly supported by the U.S. Forest Service, U.S. Geological Survey, Bureau of Land Management, National Park Service, and the U.S. Fish and Wildlife Service, addresses both natural and social science issues related to the management of parks, wilderness, and other categories of protected areas.

Dr. Parsons began his career with the federal government in 1973 as a research biologist for the National Park Service at Sequoia and Kings Canyon National Parks, California. He served as a research scientist there from 1983 to 1993; he then became field station leader for the National Biological Survey at Sequoia and Kings Canyon shortly before taking the helm at the ALWRI.

Chris Brown, director of Wilderness and Wild and Scenic Rivers program with the U.S. Forest Service, commented on Dave's retirement: "Thanks for all you've done to make ALWRI such an important force in the wilderness arena."

Dave received his Ph.D. from Stanford University in 1973, with a focus on comparative vegetative studies in California and Chile. He earned his B.S. in biology at the University of California, Davis. Dr. Parsons traveled extensively in his youth as the son of a well-known cultural geographer (another Dr. Parsons), living and/or studying in Cost Rica, Chile, Colombia, and Spain. He is conversant in Spanish.

Dave was a member of the Executive Committee of the 8th World Wilderness Congress in Anchorage, Alaska, in 2005, and planned and led several sessions at the 9th World Wilderness Congress in Mérida, Mexico. He also served on the board of directors of the George Wright Society for six years and chaired the society's Biennial Conference on Science and Resources Management in Protected Areas in both 2003 and 2005. He was a member of the International Union for Conservation of Nature World Commission on Protected Areas and has contributed more than 150 published papers in journals and conference proceedings.

**David Parsons.**

Dave and his wife, Suzi, will continue to live on their farm in Montana's Bitterroot Valley. Dave reflected at his retirement:

> Without a doubt, what I'll miss most will be the professional and personal interactions with professional colleagues, both at ALWRI and in academia and other agencies. The fact that I will not miss much of the administrative bureaucracy probably means that I was not really a very good fit for that kind of a job. The things I am proudest of over my professional career all revolve around bringing the best possible science to the table for land management decisions. I think I was always strongest when I was connecting individuals—whether it was scientists with scientists or scientists with managers. I look forward to being able to continue involvement in conservation science, both through professional contacts (individuals and societies) without the distractions of the bureaucracy. I think I am a conservationist and a scientist first and look forward to being able to spend more time attending to such matters. I greatly value my many professional friends and colleagues and look forward to interacting with them on issues that matter most to me.

"I think I am a conservationist and a scientist first and look forward to being able to spend more time attending to such matters."

ALAN WATSON is a senior scientist at the ALWRI and an *IJW* editor; email: awatson@fs.fed.us.

GREG KROLL is an *IJW* Digest editor; wildernessamigo@yahoo.com.

# Emerging Wilderness Understandings

BY JOHN C. HENDEE

**Editor's Note**: Dr. John C. Hendee, University of Idaho emeritus professor and editor-in-chief of the *International Journal of Wilderness* (*IJW*), was honored by the U.S. Forest Service with a Lifetime Leadership Award for Education in Wilderness Management and Stewardship. The Lifetime Leadership Award was presented to Dr. Hendee by Forest Service deputy chief Joel Hoeltrop at a plenary session of the 9th World Wilderness Congress (WILD9) in Mérida, Mexico, November 12, 2009. Dr. Hendee worked for the U.S. Forest Service from 1961 until 1985, then became dean (1985–1994] and professor at the University of Idaho, retiring in 2002. He was responsible for launching the *IJW*, co-authored four editions of the textbook *Wilderness Management*, the book *Wildlife Management in Wilderness*, and the 6th and 7th editions of *Introduction to Forests and Renewable Resources*.

Last November, I attended the 9th World Wilderness Congress (WWC) in Mérida, Mexico (WILD9), making this one of the seven WWCs that I have attended. WWC gatherings always stimulate my reflection on the status and progress of the wilderness idea in the world. Reflecting on my 45 years of wilderness-related research, writing, teaching, and administration work, here are five of the important wilderness understandings I think have emerged and are present today.

1. Wilderness is the ideal extreme of environmental protection, and this gives it broad relevance:

- As the polar extreme of the environmental protection continuum, wilderness represents the most intact, protected ecosystems that remain on Earth. This is an inspiring ideal, something to strive for, a benchmark for comparison, and thus is relevant to discussion of all topics along the environmental protection continuum. This is the generic, central idea around which the WWCs have been periodically convening people for 33 years, as stated by WILD Foundation president Vance Martin: "To investigate, clarify, and communicate the many and varied values of wild nature to human society … toward more protection and stewardship of wilderness globally" (Martin 2010, p. 37)
- Some delegates object to a wilderness congress embracing varied environmental and nature-human topics, rather than focusing on strictly protected wilderness. WWC planners understand the need for broad appeal. But "wilderness as ideal" is the drawing power and reference point for the WWC experience. WILD9 attracted 1,800 delegates from more than 50 countries, despite a world economic recession. Some earlier WWCs have drawn even more attendees. This involvement of participants shows the power of wilderness to convene people concerned about diverse topics related to protecting the world's remaining wild nature. Growth

**John Hendee in the Mojave Desert wilderness, California.**

in worldwide wilderness protection suggests the value of these WWC gatherings.

2. Wilderness has achieved international stature: beginning as a concept in the United States, it now exists in many countries in varied forms:
- Nine countries now have wilderness protection laws, two more have laws pending, and at least 10 additional nations protect wilderness through management policies or zoning mechanisms (Martin and Watson 2009; Kormos 2008). This is impressive progress.
- The wilderness protection in other countries demonstrates the cultural relativity of the wilderness idea—to protect the most ecologically intact areas in a country—whether as undeveloped as U.S. wilderness areas or whether they allow more established and historic human uses of wilderness, often by indigenous peoples.
- Documenting its international stature, wilderness is now a recognized category of protected area by the United Nations International Union for the Conservation of Nature. This was but a dream when my career began in the 1960s.

3. Ecosystem services make wilderness a pro-people idea:
- Human societies everywhere depend on wild areas for clean air, water, natural gene pools for medicine and foods, wildlife and fish for nutrition and enjoyment, and opportunities for inspiration, solitude, and leisure experiences that are a widespread basis for ecotourism.
- Although these services to humans derive from many kinds of wild areas in varying degrees of protection, the most pure and secure sources of ecosystem services are in the most protected wilderness areas. The increasing recognition of all these services is helping wilderness take on a pro-people identity.

WWC gatherings always stimulate my reflection on the status and progress of the wilderness idea in the world.

4. Wilderness helps stabilize the world's climate:
- WILD9 convened under the theme Wilderness: The Climate's Best Ally, and it is true. Protection of wild natural areas helps combat global warming by providing large areas where $CO_2$ is absorbed from the atmosphere and carbon is sequestered. Thus, it is becoming clear that destruction of undisturbed natural areas is among the most destabilizing of global climate influences.
- This emerging understanding on the value of natural areas for stabilizing climate provides a supporting rationale for protecting wild nature everywhere, and especially as wilderness, the most secure and pure of protected areas. This emerging truth is supporting a "nature needs half" movement with a goal of protecting and interconnecting half of the world's lands and seas as a core concern of global development impacts and human well-being (Martin 2010).

5. Experiencing wilderness is inspiring and empowering:
- There is increasing recognition that experiences in wilderness are inspiring and empowering for participants, just as they were for our indigenous ancestors who lived there and identified many areas as sacred. A robust industry now takes people to wilderness for personal growth, self-discovery, and therapy.
- Whereas wilderness can provide the most intense experience of nature—and thus maybe the most beneficial effects—people are recognizing that there is a continuum of environmental experiences, and that even a walk in a city green-space or rural hiking trail can be calming and healing.

These five understandings that have emerged during my career give me great hope and optimism for an expanded future of worldwide wilderness. I hope they do the same for you.

## References


Kormos, Cyril, ed. 2008. *Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum Publishing.

Martin, Vance. 2010. The 9th World Wilderness Congress. *International Journal of Wilderness* 16(1): 37–42.

Martin, Vance, and Alan Watson. 2009. International wilderness. In *Wilderness Management: Protection and Stewardship of Resources and Values*, ed. Chad P. Dawson and John C. Hendee (pp. 50–88). Golden, CO: Fulcrum Publishing.



JOHN C. HENDEE is emeritus professor and retired dean of the College of Natural Resources at the University of Idaho. He is a director of The WILD Foundation, and a founder and editor-in-chief of the *International Journal of Wilderness*; email: john@wild.org.

# Improving Wilderness Stewardship Through Searchable Databases of U.S. Legislative History and Legislated Special Provisions

BY DAVID R. CRAIG, PETER LANDRES, and LAURIE YUNG

The online resource Wilderness.net currently provides quick access to the text of every public law designating wilderness in the U.S. National Wilderness Preservation System (NWPS). This article describes two new searchable databases recently completed and added to the information available on Wilderness.net to help wilderness managers and others understand and interpret these laws. The first database provides access to a legislative history library and reference guide, and the second database provides access to legislated special provisions. Each database is described below in terms of how it may be used to inform decisions concerning wilderness stewardship, along with basic information about organization and content. We conclude with a brief discussion of research questions that may be more readily explored now that these databases are available.

Coauthors (l to r) David R. Craig, Peter Landres, and Laurie Yung

## Legislative History Database

Folsom (1972, p. 1) defines legislative history as "explanations of the legislators themselves, or the documents used by them, in the course of making a specific law." For federal laws designating wilderness, this course is often lengthy and complex, involving a number of unsuccessful attempts and an extensive congressional record. This history is contained in committee reports, congressional hearings, floor debate, and statements before Congress. Legally, legislative history is used to clarify the intent behind legislation only when the plain meaning of the legislation itself is not clear or is ambiguous. In these situations, legislative history may serve as a reference point for understanding the intent of Congress. However, if the language of a statute is clear and unambiguous, then interpretation must be based solely on the wording of the statute. Meyer (2000) summarizes guidance on using legislative history as a tool in wilderness management, and cautions. "All legislative history is not created equal, nor is it always an appropriate recourse. Therefore, it is important to clearly understand the implications, merits and limitations of legislative history before applying it to management questions" (p. 343).

The legislative history database developed by the authors contains the complete congressional record related to every wilderness law, and provides access to many of the electronic documents comprising these histories. This searchable database is available online at Wilderness.net (www.wilderness.net/legislativehistory/).

### The Significance of Legislative History

When addressing questions concerning the intent or meaning of a law, legislative histories provide context for more accurate interpretation of statutory language. Analyzing legislative history may help settle disputes over the way a wilderness area should be managed. For example, Meyer (1998) offered a resolution to the disagreement over use of a newly acquired airstrip in the Eagle Cap Wilderness in Oregon by analyzing congressional intent regarding the area's management. Similarly, Watson et al. (2004) used legislative history to determine congressional intent for jet-boat use on the Salmon River in the Frank Church-River of No Return Wilderness in Idaho. Courts routinely use legislative history to understand congressional intent in resolving disputes.

Examining the legislative history of a wilderness law may help explain its evolution over time, often through rounds of political negotiation. Acreage amounts, boundaries, and management provisions can differ significantly between bills. For example, P.L. 103-77, the Colorado Wilderness Act of 1993, contains a provision for the construction, operation, use, maintenance, and repair of water project facilities and diversion systems in the Hunter-Fryingpan Wilderness. It also includes a provision that protects state mineral interests in the Lost Creek Wilderness. Neither of these special provisions was included in 98 H.R. 5426, an early version of this bill. Furthermore, only one of the 10 wilderness areas eventually designated by P.L. 103-77, the Raggeds Wilderness, was designated with the same acreage amount as was originally proposed in 98 H.R. 5426; all other acreage amounts were altered as the bill evolved.

Examples from other laws abound and demonstrate how legislative history provides insight into the political, economic, and social dimensions that shape the process and character of wilderness designation. From testimony by local officials to congressional debate on the floor of the House and Senate, these voices bring life to legal text and illustrate the interests and concerns of both proponents and opponents of wilderness area designation.

### Building the Legislative History Database

The legislative history of some public laws may be spare and concise, with wilderness areas designated by a single version of a bill. Often though, legislative histories are far more complex, with some wildernesses only designated following years of unsuccessful attempts by different congressional members through a variety of bills. One example is 96 H.R. 5341, a bill that passed the House in 1980 but was never voted on in the Senate. This failed bill is part of the legislative history of two wilderness laws because of the wilderness areas it sought to designate. Some of these areas include the Bell Mountain, Rockpile Mountain, Piney Creek, and Devils Backbone wildernesses in Missouri, designated by P.L. 96-560, a different bill introduced during the same congressional session. The other wilderness areas contained in 96 H.R. 5341, the Pocosin, Sheep Ridge, Catfish Lake South, and Pond Pine wildernesses of North Carolina, were designated four years later by P.L. 98-324. Failed bill 96 H.R. 5341 is therefore included as part of the legislative history of both wilderness laws in the database.

Many unsuccessful bills from within the decade following the Wilderness Act contain the "seeds" for wilderness areas designated by future laws. For example, 93 H.R. 4793 sought to designate more than 50 wilderness areas in 19 different states. Most of these areas were designated more than a decade later through 16 different public laws, generally on a state-by-state basis. Through this early omnibus-style bill, wilderness areas designated by the Eastern Wilderness Areas Act of 1973, the Arkansas Wilderness Act of 1984, and the New England Wilderness Act of 2006, find a common legislative origin. The legislative history database traces the complete genealogy of these and every law designating wilderness back to its original bill or bills. The database does not, however, include legislation for areas that were proposed as wilderness but never designated.

### Content of the Legislative History Database

The legislative history database for Wilderness.net was largely compiled using electronic information from the online resources Lexis-Nexis Congressional (web.lexis-nexis.com/congcomp) and the Library of Congress website THOMAS (thomas.loc.gov). Lexis-Nexis provides information back through the 101st Congress (1989–1990), and THOMAS provides information back through the 93rd Congress (1973–1974). Both online resources identify all bills related to the particular bill of interest. For the development of the database for Wilderness.net, related bills were examined to determine whether they included wilderness proposals, and from these, more related bills were identified. In this manner, a chain of relevant bills and related legislative history documents were compiled to ensure a comprehensive collection of all wilderness-related bills and their records.

Congressional debate, committee reports, and the details of all major

actions for bills are available in electronic documents back to 1989 and the 101st Congress. Prior to 1989, in most cases, only a Bill Tracking Report (BTR) was available electronically. A BTR provides an abstract of a bill's primary details, including a summary of the bill's language and a list of relevant documents, but does not include the text of reports, debates, or speeches. BTRs are available online for bills recently introduced, back through 1973 (93rd Congress). For the Wilderness.net database, BTRs for bills considered prior to 1973 were constructed from information available in the Congressional Record, the original source for the information collected from Lexis-Nexis and THOMAS.

In the legislative history database, all bills are cross-referenced with related bills and laws. The database provides detailed information about each related congressional document, including the reference information required to find a record in a federal repository library if no electronic version of the file was available. For example, whereas most early committee reports and congressional hearings will still need to be found in a federal repository library, the legislative history database greatly simplifies the process of collecting these documents by providing substantial reference information. Most importantly, this database identifies the existence of these documents, eliminating the need for preliminary searches to identify documents related to a particular wilderness bill or law.

## Special Provisions Database

Special provisions are typically thought of as legislated exceptions to the 1964 Wilderness Act Section 4(c) prohibitions against commercial enterprise, permanent roads, motor vehicles, motorized equipment, aircraft landing, mechanical transport, structures, and installations. Oftentimes, activities or uses that are allowed by such special provisions are referred to as "nonconforming" uses (see figure 1). Section 4(d) of the 1964 Wilderness Act includes eight special provisions that apply to all the wildernesses designated in 1964 as well as all subsequently designated wilderness. In the first compilation and description of special provisions in wilderness legislation, Browning et al. (1988) generally define special provisions as "specific guidelines for allocation and management based upon unique circumstances of local or regional concern." When included in legislation, special provisions or other specific management directions are legal requirements for designating and managing a wilderness (Dawson and Hendee 2009).

**Figure 1—Indian Creek airstrip. A special provision in P.L. 96-312 allows aircraft landings in the Frank Church-River of No Return Wilderness in Idaho. Photo by David R. Craig.**

To assemble the special provisions database, the text of every wilderness law was read and all special provisions were identified. Based on the potential for alternative interpretations, we included all provisions that differ from the statutory language of the 1964 Wilderness Act in the special provisions database. Furthermore, because there is no exact definition of a special provision, we included all provisions that modified management of a specific wilderness, but were not necessarily exceptions to Section 4(c) of the Wilderness Act, such as boundary adjustments. This searchable database is available online at Wilderness.net (www.wilderness.net/specialprovisions/).

### *The Significance of Special Provisions*

Some people believe that special provisions challenge the statutory, as well as the philosophical definition of wilderness. Others believe that on-the-ground conditions or political realities demand wilderness-specific special provisions. Thus, special provisions are at the heart of many controversies over the designation and management of wilderness areas (Gorte 2009; Nickas and Proescholdt 2005). Some special

provisions originated as Congressional Committee Reports, such as the grazing provisions in the Colorado Wilderness Act. Many special provisions allow the same types of activities and levels of use present in an area at the time of its designation as wilderness. For example, special provisions allow for mining exploration in the Cranberry Wilderness in West Virginia, motorboat use in the Boundary Waters Canoe Area Wilderness in Minnesota, and the right of public access to a cemetery in the Charles C. Deam Wilderness in Indiana.

Special provisions are often broadly worded, and although granting rights of access and use, generally provide few or no details about how these provisions are to be implemented and the levels of use that should be allowed. For example, jet-boat use on the Salmon River in the Frank Church-River of No Return Wilderness is allowed by P.L. 96–312 "to continue at a level not less than the level of use which occurred during calendar year 1978." But determining exactly what those levels were in 1978 and what they should be now has generated considerable debate and at times contention (Watson et al. 2004).

Some special provisions are written in similar, but not identical language to those provisions contained in Section 4(d) of the Wilderness Act. Nickas and Proescholdt (2005) argue that slight differences in statutory language inevitably lead to different managerial interpretations and less restrictive provisions, allowing types of nonconforming uses unintended by legislators. The authors cite as a prominent example the inclusion of the words *National Forest System* in the statement "the Secretary shall provide such access to non-federally-owned land within the boundaries of the National Forest System" in Section 1323[a] of the 1980 Alaska National Interest Lands Conservation Act, an act in which every other wilderness provision is specific to Alaska. This provision has been subsequently interpreted by some managers as applicable to all national forest lands, and has led to approval of motorized use to access nonfederal lands within wilderness areas in other states.

**Table 1—Special provisions database primary and secondary categories**

| |
|---|
| **ACCESS** |
| Easements |
| General access |
| Mechanized access |
| Military access |
| Motorized access |
| Tribal access |
| **COMMERCIAL USE** |
| Grazing |
| Mining |
| Permits/Licenses/Leases |
| Recreation services |
| Timber |
| **GENERAL ADMINISTRATION** |
| Acquisition/Exchange |
| Agency jurisdiction |
| Appropriations |
| Buffer zones |
| General administration |
| Inholdings |
| "Minimum necessary" requirements |
| Pre-existing uses/rights/laws |
| **MOTORIZED/MECHANIZED USE** |
| Aircraft/helicopters |
| Mechanized equipment |
| Motorboats |
| Motorized equipment |
| Motorized vehicles |
| **PUBLIC USE AND FACILITIES** |
| Hunting/Fishing/Trapping |
| Recreation development |
| Structures/Roads |
| Trails/Bridges/Signs |
| **NATURAL AND CULTURAL RESOURCE MANAGEMENT** |
| Cultural resources |
| Insects/Diseases/Invasive species |
| Fire management |
| Fisheries |
| Monitoring/Data collection/Evaluation |
| Resource development |
| Wildlife management |
| **WATER** |
| Water facilities |
| Water resources |
| Water rights/laws |

### *Organizing the Special Provisions Database*

Special provisions were organized according to primary and secondary categories (see table 1). Where a specific provision relates to several aspects of wilderness management, the provision is categorized under each relevant secondary category. For example, designation of the Carson-Iceberg Wilderness in California contained a special provision ensuring continued motorized access to facilities used for livestock grazing activities. In this case, the provision was categorized under grazing, motorized access, and structures/roads. The text provided in the database for a special provision in a particular category often contains language related to other provisions (situated just before or just after the provision of interest), which is included in the excerpt for context. Special provisions can also be accessed by wilderness law and wilderness area in the database.

## Conclusion

Our intent in developing both databases and making them readily available on Wilderness.net is to provide wilderness managers and others access to information that is often difficult and cumbersome to locate. The accessible legislative history and special provisions databases assist wilderness managers in determining congressional intent for the areas they manage and, in some cases, improve wilderness management by reducing confusion

The accessible legislative history and special provisions databases assist wilderness managers in determining congressional intent for the areas they manage and, in some cases, improve wilderness management by reducing confusion regarding how to interpret wilderness law.

regarding how to interpret wilderness law. Furthermore, the two databases complement one another. For example, if the meaning of a special provision is not sufficiently clear, the bill's legislative history may reveal the intent behind the special provision. An explicit example of this occurs with a special provision for grazing in the Mount Massive Wilderness of Colorado, an area managed by both the U.S. Fish and Wildlife Service and the U.S. Forest Service, where the only information given is that grazing on Forest Service land shall be managed "in accordance with the guidelines contained…in the House Committee Report (H. Report 96-617) accompanying this Act." The insight provided by the legislative history database may be especially valuable for special provisions that evolved from the earliest versions of those bills proposing an area's designation.

In addition, the legislative history and special provisions databases can be utilized to answer contemporary questions about wilderness legislation. For example, are there more or fewer special provisions in recent laws, as compared with past laws? Does recent wilderness legislation that is increasingly the result of intense local negotiation contain more special provisions than previous legislation, and do these provisions contain sufficient detail to allow for effective management? Do members of Congress debate and describe these provisions in different ways at different points in time? Once a special provision is inserted into a particular law, is it likely to be used again in subsequent proposals? The databases allow for investigation of such contemporary concerns about wilderness legislation. Answering these questions will assist us in understanding how wilderness law and management are changing over time, and allow us to consider the implications of such changes.

## Acknowledgments

We thank the four wilderness managing agencies and the College of Forestry and Conservation at The University of Montana for supporting development of these databases. We thank Liz Nysson who helped gather data and Chris Barns, Tom Carlson, Chad Dawson, Lisa Eidson, and Cindy Swanson for their comments on earlier versions of this manuscript.

## References

Browning, J.A., J.C. Hendee, and J.W. Roggenbuck. 1988. 103 Wilderness laws: Milestones and management direction in wilderness legislation, 1964–1987. *Bulletin Number 51*. Moscow, ID: College of Forestry, Wildlife and Range Sciences, University of Idaho.

Dawson, C. P., and J. C. Hendee. 2009. *Wilderness Management: Stewardship and Protection of Resources and Value*s, 4th ed. Golden, CO: Fulcrum Publishing.

Folsom, G. B. 1972. *Legislative History: Research for the Interpretation of Laws.* Charlottesville: University Press of Virginia.

Gorte, R. W. 2009. *Wilderness Laws: Permitted and Prohibited Uses*. Congressional Research Service Report RL33827. Available online at: wikileaks.org/wiki/CRS-RL33827.

Meyer, S. 1998. Wilderness airstrips: A case study for using legislative history to inform wilderness management. M.S. thesis, The University of Montana, Missoula.

———. 1999. The role of legislative history in agency decision making: A case study of wilderness airstrip management in the United States. *International Journal of Wilderness* 5(2): 9–12.

———. 2000. Legislative interpretation as a guiding tool for wilderness management. In *Wilderness Science in a Time of Change Conference—Volume 5: Wilderness Ecosystems, Threats, and Management*, comp. D. N. Cole, S. F. McCool, W. T. Borrie, and J. O'Loughlin, J. (pp. 343–347); 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-5, Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Nickas, G., and K. Proescholdt. 2005. Keeping the wild in wilderness: Minimizing nonconforming uses in the National Wilderness Preservation System. *International Journal of Wilderness* 11(3): 13–18.

Watson, A. E., M. Patterson, N. Christensen, A. Puttkammer, and S. Meyer. 2004. Legislative intent, science, and special provisions in wilderness. *International Journal of Wilderness* 10(1): 22–26.

DAVID R. CRAIG is a research associate for the Wilderness Institute and works as a forestry technician for the Salmon-Challis National Forest managing recreation on the Middle Fork of the Salmon River; email: dcraig@fs.fed.us.

PETER LANDRES is an ecologist at the Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station, USDA Forest Service; email: plandres@fs.fed.us.

LAURIE YUNG is the director of the Wilderness Institute, College of Forestry and Conservation, The University of Montana; email: laurie.yung@umontana.edu.

# Special Provisions of Wilderness Legislation in the United States, 1964 to 2009

BY CHAD P. DAWSON, BLAKE PROPST, and JOHN C. HENDEE

Since passage of the Wilderness Act of 1964 (U.S. Public Law 88-577), there have been 172 public laws passed by Congress and approved by the president that designate and affect wilderness management and stewardship through 2009. The Wilderness Act is one of the most successful U.S. environmental laws, standing for 45 years without a substantial amendment, although one minor amendment did occur regarding permitted but nonconforming uses in the Boundary Waters Canoe Area Wilderness, and subsequent legislation did provide interpretation and clarification of some management directions.

The National Wilderness Preservation System has grown from the 54 areas and 9.1 million acres (3.6 million ha) established by the Wilderness Act in 1964, to more than 790 wilderness units totaling 109 million acres (44.1 million ha) by 2010. Generally, this wilderness designation legislation has reaffirmed the management direction in the Wilderness Act of 1964 and most have added new areas and additional acreage to existing areas. However, some of the additional 172 laws have provided additional management direction, interpretation, and clarification; special provisions for wilderness uses, activities, limitations, or management; released or designated wilderness study areas; and other laws have provided for adjusted wilderness boundaries or changed a wilderness name.

We define *management direction* as congressional provisions that affirm, interpret, or modify management direction of the 1964 Wilderness Act for one or more wilderness areas (Browning et al. 1988; Dawson and Hendee 2009). Frequently, the legislation or accompanying committee reports expressly state that these directions are not intended to amend the 1964 Wilderness Act. Examples include mining, motorized access, grazing, buffer zones, fish and wildlife, fire control, disease control, and facilities and structures.

The term *special provisions* refers to specific management issues and directions that apply only to the wildernesses designated by a particular act and usually reflect unique situations that may be exceptions to provisions of the Wilderness Act of 1964. Examples include military overflights, water access rights, and study area release from wilderness consideration (Browning et al. 1988; Dawson and Hendee 2009).

## Methods

We conducted a legislative search based on past published lists of wilderness legislation (Browning et al. 1988; Dawson and Hendee 2009) and supplemented by the THOMAS website from the Library of Congress (thomas.loc.gov); Lexis-Nexis Congressional website (web.lexis-nexis.com/congcomp); and hand-searching published wilderness legislation enacted before 1973. The intent of this search was to identify the total number of pieces of legislation that included a management direction or special provision. We then compared some of our results with those found using the special provisions web-based search engine (www.wilderness.net/specialprovisions/) reported by Craig, Landres, and Yung (2010) since they recorded every instance a management direction or special provision was mentioned regardless of whether it was repeated in the same piece of legislation or not.

Our objective was to explore the often-mentioned proposition that wilderness legislation enacted into law includes more management direction and special provisions over time, and once included as a legislative provision they appear in subsequent legislation with a related concern or situation.

## Selected Results and Discussion

Management direction does tend to repeat in subsequent legislation. For example, our literature and manual search of the legislation found that the Colorado Wilderness Act of

1980 (P.L. 96-560) referred to House Committee Report 96-617 for direction on managing livestock grazing, and subsequently 19 designating wilderness acts included similar management direction (also refers to House Report 101-405) about grazing activities and facilities on U.S Forest Service and Bureau of Land Management wilderness lands. A search of grazing as a category on the www.wilderness.net/specialprovisions/ website resulted in 64 "hits" on that category since 1964, which appeared in 28 different laws in one form or another. Fifteen laws had two or more instances (e.g., separate sections of that law) in which grazing was flagged as a category, and the highest number of times it was mentioned in any one bill was in the Omnibus Public Land Management Act of 2009 (P.L. 111-110), which had 17 instances of mentioning grazing as either a management direction or special provision (i.e., it was a complex piece of legislation with many separate sections or bills appended together).

Another example of management direction is the prohibition on requiring buffer zones around wilderness. The New Mexico Wilderness Act of 1980 (P.L. 96-550) prohibited buffer zones following prior Senate and House reports (S 98-465 and HR 96-1126), and subsequently 24 designating wilderness acts included similar direction about prohibiting buffer zones with wilderness designations. A search of buffer zones as a category on the www.wilderness.net/specialprovisions/ website resulted in 45 "hits" on that category, which appeared in 29 different laws in one form or another. Nine laws had two or more instances in which buffer zones was flagged as a category, and the highest number of times it was mentioned in one bill was in the Omnibus Public Land Management Act of 2009 (P.L. 111-110), which had eight instances of mentioning buffer zones specifically.

Special provisions also tend to repeat in subsequent legislation. For example, our literature and manual search of the legislation found that the Endangered American Wilderness Act of 1978 (P.L. 95-237), in designating the Hunter-Fryingpan Wilderness area of the White River National Forest in Colorado stated that "nothing in this act shall be construed to expand, abate, impair, impede, or interfere with the construction, maintenance, or repair of said Fryingpan-Arkansas Project facilities, nor the operation thereof, pursuant to the Operating principles, House Document Numbered 130, Eighty-seventh Congress, and pursuant to the water laws of the State of Colorado." Subsequently, we note that 17 designating wilderness acts made statements about the water rights for the wilderness area, for other internal or external uses as part of that legislation, or note that state water law prevails. A search of water rights as a category on the www.wilderness.net/specialprovisions/ website resulted in 51 "hits" since 1964 on that category, which appeared in 27 different laws in one form or another. Fourteen laws had two or more instances in which water rights was flagged as a category, and the highest number of times it was mentioned in one bill was in the Omnibus Public Land Management Act of 2009 (P.L. 111-110), which had seven instances of mentioning water rights specifically.

Another example of a special provision is military access on the ground or in overflights of wilderness. The Alaska National Interest Lands Conservation Act (P.L. 96-487) permits "access, operation, and maintenance [of existing facilities for national defense] within wilderness areas designated by this act," and subsequently 10 designating wilderness acts included similar military access on the ground or in overflights of wilderness. A search of military access as a category on the www.wilderness.net/specialprovisions/ website resulted in 44 "hits" on that category, which appeared in 12 different laws in one form or another. Eleven laws had two to nine instances in which military access on the ground or in overflights was flagged as a category in that website search.

## Overview

In an attempt to take a larger overview of all the categories of management direction and special provisions over time, we plotted the cumulative number of pieces of wilderness legislation that designated or added area to an existing wilderness, and the number of those same pieces of legislation that had one or more management directions or special provisions based on our literature and manual search of the legislation (see figure 1). Additionally, we looked at the percentage of legislation each year that had one or more management directions or special provisions (see figure 2) and concluded there is a slight upward trend. We were unable to use the www.wilderness.net/specialprovisions/ website to calculate a similar analysis (i.e., it was designed to look at specific areas and provisions, not across all areas and all provisions). Thus, we were unable to calculate the total number of special provisions per piece of legislation per year to determine if the total number of special provisions was increasing or not.

We conclude that wilderness legislation enacted into law includes substantial management direction and special provisions over time, and once included as a legislative provision they often appear in subsequent legislation with a related concern or situation.

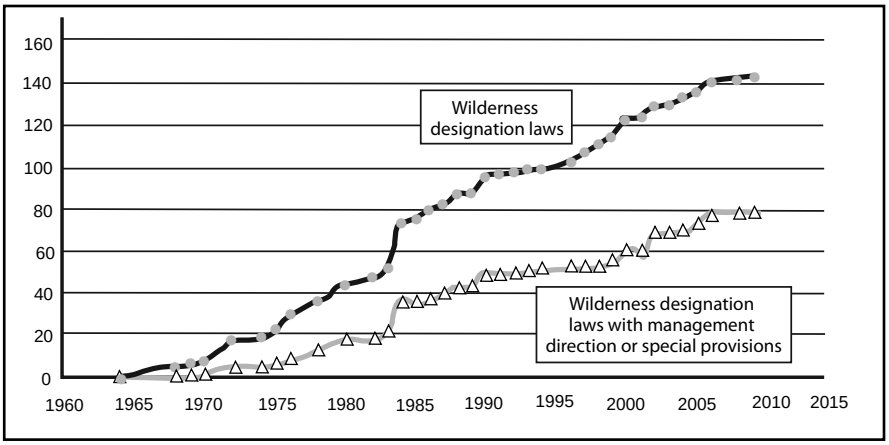



**Figure 1—The cumulative number of wilderness laws designating new or additional area (upper line) and the cumulative number of laws with one or more special provisions or management directions (lower line) since 1964.**

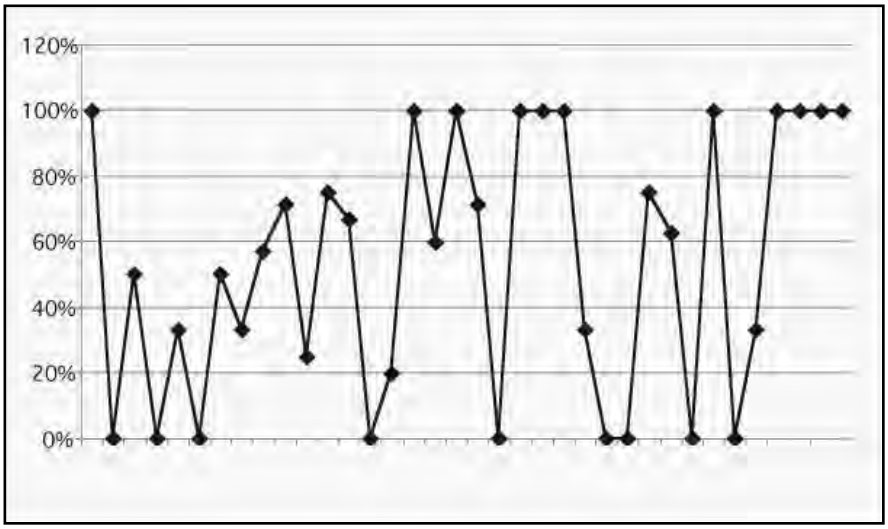



**Figure 2—The annual percentage of wilderness laws designating new or additional area with one or more special provisions or management directions since 1964.**

Not surprisingly, this legislative tendency follows from the long and drawn out political processes that led to passage of the original Wilderness Act of 1964.

Related questions are why these have happened and whether these management directions and special provisions are detrimental to wilderness characteristics and natural conditions and processes on the ground. Answering that series of questions starts with reading the individual legislative histories and actual legislative wording, as suggested by Craig, Landres, and Yung (2010). Answering the question about whether these management directions and special provisions are detrimental to wilderness characteristics and natural conditions and process on the ground requires a national wilderness character monitoring system (Landres et al. 2009) to be put in practice so that long-term information can answer the concerns raised about wilderness character.

## References

Browning, James A. John C. Hendee, and Joe W. Roggenbuck. 1988. 103 wilderness laws: Milestones and Management direction in wilderness legislation, 1964–1987. *Bulletin 51*. Moscow: University of Idaho, Idaho Forest, Wildlife and Range Experiment Station.

Craig, D. R., P. Landres, and L. Yung. 2010. Improving wilderness stewardship through searchable databases of U.S. legislative history and legislated special provisions. *International Journal of Wilderness* 16(2): 27–31.

Dawson, C. P., and J. C. Hendee. 2009. *Wilderness Management: Stewardship and Protection of Resources and Values*, 4th ed**.** Golden, CO: Fulcrum Publishing.

Landres, P., S. Boutcher, T. Blett, D. Bumpus, T. Carlson, D. Cole, L. Dean, T. Hall, C. Hardy, A. Leach, A. Mebane, L. Merigliano, S. Rinehart, and P. Wright. 2009. *Technical Guide for Monitoring Selected Conditions Related to Wilderness Character***.** General Technical Report WO-80. Washington, DC: USDA Forest Service, U.S. Government Printing Office.

U.S. Public Law 88-577. The Wilderness Act of September 3, 1964. 78 Stat. 890.

U.S. Public Law 95-237. Endangered American Wilderness Act of 1978. February 24, 1978. 92 Stat. 40.

U.S. Public Law 96-487. The Alaska National Interest Lands Conservation Act of December 20, 1980. 94 Stat. 2371.

U.S. Public Law 96-550. The New Mexico Wilderness Act of December 19, 1980. 94 Stat. 3221.

U.S. Public Law 96-560. Colorado Wilderness Act of December 22, 1980. 94 Stat. 3266.

U.S. Public Law 111-110. The Omnibus Public Land Management Act of March 30, 2009. 123 Stat. 991.

CHAD P. DAWSON is a professor at the SUNY College of Environmental Science and Forestry at Syracuse, New York, and managing editor of *IJW*; email: cpdawson@esf.edu.

BLAKE PROPST is a recreation specialist at Elmcrest a residential program for youth at Syracuse, New York.

JOHN C. HENDEE is a professor emeritus from the University of Idaho and editor-in-chief of *IJW*; email: john@wild.org.

# The Janos Biosphere Reserve, Northern Mexico

BY RURIK LIST, JESÚS PACHECO, EDUARDO PONCE, RODRIGO SIERRA-CORONA, and GERARDO CEBALLOS

## Introduction

November 28, 2009, marks a historic date for the conservation of large endangered mammals in Mexico. That day the gate of the quarantine corral, where 23 bison (*Bison bison*) from Wind Cave National Park had spent the two weeks since their arrival from the United States, was opened and the bison released, running into the short grass prairie of Janos, Chihuahua, Mexico. For the first time in at least a century, genetically pure bison roamed again in Mexico (see figure 1).

The release of the bison was the preamble of an even more important, large-scale conservation issue. On December 8, the Janos Biosphere Reserve (JBR) was established by presidential decree (Diario Oficial de la Federación 2009; figure 2). With more than half a million hectares (more than a million acres), JBR became the first federally protected area with the main objective to protect native grassland ecosystems in Mexico (see figure 3). The decree was the culmination of more than two decades of scientific research and conservation work in the region, whereas the bison release marked the beginning of a new era in JBR, which will be focused on restoration, improved land management practices, and the development of alternative use of the region's resources.

**Gerardo Ceballos, Jesús Pacheco, Rurik List, Rodrigo Sierra-Corona, and Eduardo Ponce (left to right). Photo by Mike Lockhart.**

The conservation story of JBR goes back to the time when Aldo Leopold visited Río Gavilán in the neighboring mountains of Casas Grandes, where he found exemplarily well-preserved ecosystems (Leopold 1937). Around that

**Figure 1—Herd of genetically pure bison from Wind Cave National Park roaming in the JBR grassland. Photo by Rurik List.**

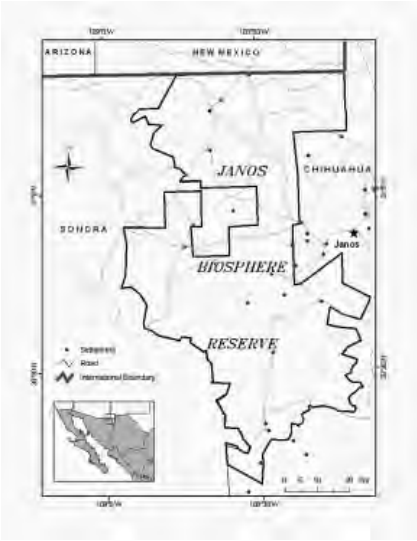



**Figure 2—Map of the Janos Biosphere Reserve.**

**Figure 3—The JBR is the first federal reserve created with the main objective to protect grassland ecosystems. Photo by Eduardo Ponce.**

time, Río Gavilán and the mountains of Janos were part of a large block of federal lands inhabited by many species, including three that regrettably are now extinct in the area: grizzly bears (*Ursus arctos horribilis*), gray wolves (*Canis lupus*), and imperial woodpeckers (*Campephilus imperialis*; figure 4). The valleys, on the other hand, were part of extensive cattle ranches covered by perennial grasslands. In the 1930s and 1940s, the Agrarian Reform gave away the federal lands and subdivided cattle ranches to satisfy landless peasants' demands. The impact of their activities and of forestry companies strongly changed environmental conditions, and a few years later, overgrazing became a severe problem in JBR (Villa 1955). Intensive logging had eliminated the old growth forest, except in the most inaccessible areas, and one by one, the imperial woodpecker, grizzly bear, and gray wolf, in that order, disappeared from the region and eventually from Mexico (Ceballos and Navarro 1991; Ceballos and Eccardi 2003).

## Biological Diversity

Despite the loss of these iconic species, the distance of JBR from the nation's capital in a centralized country helped to maintain most other biological components of the sierras and valleys of JBR, while the rest of the country was losing both species and habitat. In 1988, when Gerardo Ceballos went searching for the black-tailed prairie dog (*Cynomys ludovicianus*) colonies reported by Anderson (1972), he found a 55,000-hectare (135,850 acre) prairie dog complex, which made it the largest in North America as 98% of the area occupied by prairie dogs had been decimated by poisoning and plague (Ceballos et al. 1993; Miller et al. 1994; figure 5).

This discovery represented a hope to find black-footed ferrets (*Mustela nigripes*), a species that depends on prairie dogs for food and shelter, and which became the first species to disappear from the wild as a consequence of the decline of prairie dogs across North America (Clark 1989). Although no ferrets were found, it became clear that the extensive prairie dog towns were of continental importance. In 1991, the Institute of Ecology from the National University of Mexico (Universidad Nacional Autónoma de México–UNAM) initiated the first biological studies in the area and started a black-footed ferret reintroduction program in 2001 (see figure 6).

Soon it became clear that the JBR area was biologically diverse, and it was recognized as priority area for biodiversity conservation in North America (List et al. 1998; Ceballos

**Figure 4—The sierras of JBR are covered by temperate forests, which once hosted grizzlies and wolves. Photo by Rurik List.**

**Figure 5—The JBR grasslands maintain one of the largest prairie dog complexes in North America. Photo by Gerardo Ceballos.**

1999; Manzano-Fischer et al. 2000; Dinerstein et al. 1998; CONABIO 2000; table 1). The outstanding biological diversity was partly the result of the presence of prairie dogs, which through their activities modify the grasslands, providing home to species such as burrowing owls (*Athene cunicularia*) and food to terrestrial and avian predators (Ceballos et al. 1999; List et al. 2003; figure 7). Also, because of their foraging behavior, they keep the plants low and modify the composition and structure of the vegetation, allowing species that need short vegetation to abound. In addition, their burrowing activities loosen the soil and improve habitat for soil invertebrates (Miller et al. 1994, 2000; Ceballos et al. 2005; Davidson et al. 2010).

There are several contributing factors to the notable biodiversity of JBR: the altitude ranges from 1,400 m (4,590 ft.) in the extensive valley, which starts at the foothills of the Sierra Madre Occidental, then goes north to New Mexico, and south and east to smaller isolated sierras in Chihuahua (see figure 8) to 2,600 m (8,530 ft.) in the peak of Las Guacamayas. The area is found at the western end of the Chihuahuan Desert, which gives the characteristic composition to the grasslands and shrubs; the temperate pine and oak forests of the Sierra Madre Occidental reach the northern end in JBR, with characteristic species such as the thick-billed parrot (*Rhynchopsitta pachyrhyncha*) and eared trogon (*Euptilotis neoxenus*). Most of the JBR is covered by open grasslands and grassland-shrubs, but there are also temperate forests, mesquite shrublands, halophytic vegetation, and agriculture (Ceballos et al. 2005).

**Table 1—Diversity and conservation status of the terrestrial vertebrates of Janos Biosphere Reserve, Chihuahua, Mexico.**

| Taxon | Orders | Families | Genera | Species | Status | | |
|---|---|---|---|---|---|---|---|
| | | | | | EN | TH | SP |
| Amphibians | 2 | 4 | 5 | 13 | 0 | 0 | 4 |
| Reptiles | 2 | 6 | 19 | 34 | 0 | 7 | 8 |
| Birds | 17 | 53 | 157 | 257 | 3 | 8 | 17 |
| Mammals | 4 | 18 | 47 | 79 | 6 | 3 | 2 |
| Total | 25 | 81 | 228 | 383 | 9 | 18 | 31 |

EN = Endangered, TH = Threatened, SP = Special Protection.

**Figure 6—Black-footed ferrets have been reintroduced in JBR. Photo by Rurik List.**

## The Creation of the Reserve

Over the years, the studies continued producing information that justified the legal protection of the Janos ecosystems, so in January 2002 we initiated the long process to include JBR in the National System of Protected Areas of the National Commission of Protected Areas (Comisión Nacional de Áreas Naturales Protegidas–CONANP) as a biosphere reserve. Over time, many governmental and nongovernmental institutions participated in this process.

The justification to create the reserve was ample and solid. JBR maintains a considerable amount of native grasslands (220,000 ha/543,400 acres), which is a critically threatened ecosystem in Mexico. The JBR was ranked the second most important area for the protection of mammals in Mexico after the Montes Azules Biosphere Reserve in the Lacandon Tropical Rain Forest of southern Mexico (Ceballos 1999).

These grasslands maintain the second largest prairie dog complex of

**Figure 7—The ferruginous hawk is one of many birds of prey that prey upon prairie dogs and abound in JBR. Photo by Eduardo Ponce.**

prairie dog towns in North America, the only free-ranging bison herd in Mexico and the southwestern United States, and small populations of Mexico's critically endangered pronghorn (*Antilocapra americana*) (Ceballos et al. 2005; List et al. 2007; List and Valdéz 2009). JBR has the only recorded breeding population of North American porcupine (*Erethizon dorsatum*) in Mexico, the largest breeding population of burrowing owl within its native habitat in North America, the largest golden eagle (*Aquila chrysaetos*) population in Mexico (List et al. 1999; Manzano-Fischer et al. 2006; McNicoll 2005), and one of the most important populations of the green toad (*Anaxyrus debilis*) (Santos et al. 2008). Finally, the reserve is an important wintering site for grassland birds, including species of conservation concern, maintaining about 2% of the entire population of mountain plover (*Charadrius montanus*) during the winter (Manzano-Fischer et al. 1999, 2006).

The mountains of JBR provide refuge to and the third most important nesting site for the endangered thick-billed parrot, one of the largest populations of black bears (*Ursus americanus*) in the Sierra Madre Occidental, and have been identified as the most suitable area for the reintroduction of the Mexican wolf (Araiza et al. 2007; Lammertink et al. 1997; List et al. 1998). There are populations of aspen forests (*Populus tremuloides*), which cover a naturally small area in Mexico, but their presence in JBR is significant (Ceballos et al. 2006).

As often happens, places rich in biodiversity are also rich in culture, and JBR is no exception. Hunter-gatherers lived here well before the written language, leaving petroglyphs and arrowheads as a sign of their presence. Later on, the Paquime culture from what is now Casas Grandes exerted its influence on the JBR, with thick adobe walls near the perennial streams, terraces in the mountains, and cliff dwellings providing testimony that the area had an important human population for centuries (Di Peso et al. 1973; Minnis and Whalen 2003; figure 9). The town of Janos was founded around 1580 by Franciscan missionaries, and in 1686 a military garrison was established to protect it from the Apache raids, but despite that, Apaches ventured frequently into the JBR until very recently (University of Texas 2010).

**Figure 8—In the foothills, the grassland mixes with oaks. Photo by Rodrigo Sierra-Corona.**

## Current Situation

The JBR region is part of a continuous system of semi-arid grassland that includes parts of New Mexico, Arizona, Texas, and Chihuahua, and is one of many protected areas along the border, some of them transboundary (Ceballos et al. 2009). As with many other binational conservation areas from the Californias to Tamaulipas/Texas, the connectivity of the biosphere reserve to the United States has been partially cut by the new border fence (List 2009). Normandy-style metal barriers with wire mesh and barbed wire set up in the winter of 2008 block part of northern portion of the reserve from the well-preserved grasslands, managed by the Maplai Borderlands Group and the Animas Foundation in Hidalgo County, New Mexico. Pronghorn and bison, among many other species, crossed back and forth over the international line, but the new fence is impassable for most medium and large mammals, and there is the risk that the fence or pedestrian wall will expand to the reminder of the Janos-Hidalgo, which would eliminate the pronghorn and bison

north of Janos (List 2007; List et al. 2007; List and Valdéz 2009).

Presently, about 2,600 people live in seven towns and scattered isolated houses or ranches within the JBR. Although most are Mexicans from different parts of the country, mainly the north, the Mennonite community is large and has an important influence in the economy of the area as the intensive agriculture brings both money and labor into the area.

Cattle ranching is the main productive activity within the JBR, but the importance of agriculture has been growing rapidly, emphasizing the need to give legal protection status to the area. After 15 years of nearly continuous drought with a fixed cattle stocking rate, severe overgrazing, soil erosion, reduction of keystone species (prairie dog), and changes in species composition and abundance, the ultimate result has been ecosystem degradation and severe desertification (Ceballos et al. 2010).

These changes were accompanied by a reduction of environmental services for the local people, such as the reduction in forage for cattle, making it unviable for many people to make a living from the land, and forcing many, especially the young, to emigrate, and the older to sell their rangelands for industrial farming. Many prairie dog towns were illegally converted into agricultural lands, and illegal drilling of wells for the center pivot irrigation systems reduced the underground water available for both ranching and some villages, generating frictions between the formerly amicable guilds of farmers, ranchers, and townspeople.

Because the concept of biosphere reserve accommodates both biodiversity and people, the establishment of a biosphere reserve became an opportunity to conserve important ecosystems and a significant part of the native flora and fauna in northern Mexico, reduce the degradation processes, and improve the current use and management of the resources of the area, which represented hope for keeping and improving the decaying quality of life of the local people. This prompted the support of the Janos inhabitants toward the establishment of the reserve without any opposition, the exception being a few ranchers and farmers.

**Figure 9. The ancient inhabitants of hunter-gatherers of JBR left petrolyphs as a sign of their presence. Photo by Rurik List.**

## The Future

The restoration of JBR's ecosystems and ecosystem services is directly linked to a better use and management of the land and research focused toward understanding the interaction between biodiversity and productive activities. We are not only looking for ways to make biodiversity and productive activities compatible, but also ways to make the main economic activities foster conservation efforts (Ceballos et al. 2009; Davidson et al. 2010; L. Martínez pers. com. 2010). This way, we will be using cattle grazing to maintain and expand prairie dog towns and control shrub expansion, and intensive agriculture to restore native grasslands in areas where the perennial grasses have disappeared and the natural recovery of the system is unlikely or in very large time scales.

Local people are already participating by removing cattle from pastures or decreasing the numbers of cattle, setting up experimental exclosures, and planting native grasses in degraded areas. Simultaneously, we continue to restore species and enhance wildlife populations, mainly in the valley, but the sierras of JBR are scantly populated, much better preserved, have less pressure than the lowlands, and are important parts of the reserve. Partly because of the inaccessibility of the rugged terrain that has preserved the ecosystems of the sierras, this portion of the reserve is the least studied, but is nonetheless a place for wandering, where one can still walk for days without meeting other people, and where puma (*Puma concolor*) and wild turkey (*Meleagris gallopavo*) still abound. Hence the work in the mountains has

to increase, and it is certain that many surprises await. We hope that soon we will be able to hear the howling of the wolf in JBR, one of the last wilderness areas of Mexico.

The restoration of JBR's ecosystems and ecosystem services is directly linked to a better use and management of the land and research focused toward understanding the interaction between biodiversity and productive activities.

## References


Anderson, S. 1972. Mammals of Chihuahua. *Bulletin of the American Museum of Natural History* 148: 377–78.

Araiza, M., L. Carrillo, R. List, E. Marínez, P. Martínez, O. Moctezuma, N. Sánchez, and J. Servín. 2007. Informe Final del Taller para la reintroducción del lobo mexicano (*Canis lupus baileyi*) en México. El Manzano, Nuevo León, Mexico, March 8, 2006.

Ceballos, G. 1999. Conservación de los Mamíferos de México. *Biodiversitas* 27: 6–7.

Ceballos, G., A. Davidson, R. List, J. Pacheco, P. Manzano, G. Santos, and J. Cruzado. 2010. Rapid decline of a grassland system and its ecological and conservation implications. *Plos ONE* 5: e8562. Doi:101371/journal.pone.0008562**.**

Ceballos, G., and F. Eccardi. 2003. *Animales de México en Peligro de Extinción*. Mexico D.F., Mexico: Fundación Alejo Peralta.

Ceballos, G., R. List, A. D. Davidson, E. L. Fredrickson, R. Sierra Corona, L. Martínez, J. E. Herrick, and J. Pacheco. 2009. Grasslands in the borderlands: Understanding coupled natural-human systems and transboundary conservation. In *Conservation of Shared Environments: Learning from the United States and Mexico*, ed. L. López-Hoffman, E. D. McGovern, R. G. Varady, and Karl W. Flessa (pp. 188–203). Tucson: University of Arizona Press.

Ceballos, G., R. List, S. Najera, P. Manzano, J. Pacheco, O. Moctezuma, M. Royo, M. Á. Cruz, and O. García. 2006. Estudio previo justificativo para el establecimiento del área natural protegida Reserva de la Biosfera Janos. Mexico D.F., Mexico: Comisión Nacional de Áreas Naturales Protegidas.

Ceballos, G., R. List, J. Pacheco, P. Manzano, G. Santos, and M. Royo. 2005. Prairie dogs, cattle, and crops: Diversity and conservation of the grassland ecosystem in northwestern Chihuahua, Mexico. In *Biodiversity, Ecosystems, and Conservation in Northern Mexico*, ed. J.L.E. Cartron, G. Ceballos, and R. Felger (pp. 425–38). Oxford, UK: Oxford University Press.

Ceballos, G., E. Mellink, and L. Hanebury. 1993. Distribution and conservation status of prairie dogs (*Cynomys mexicanus* and *C. ludovicianus*) in Mexico. *Biological Conservation* 63: 105–12.

Ceballos, G., J. Pacheco, and R. List. 1999. Influence of prairie dogs (*Cynomys ludovicianus*) on habitat heterogeneity and mammalian diversity in Mexico. *Journal of Arid Environments* 41: 161–72.

Ceballos, G., and D. Navarro. 1991. Diversity and conservation of Mexican mammals. In *Topics in Latin American Mammals: Ecology, Evolution and Education,* ed. M. A. Mares and D. J. Schmidly (pp. 167–98). Norman: University of Oklahoma Press.

Clark, T. W. 1989. Conservation biology of the black-footed ferret *Mustela nigripes. Special Scientific Report No. 3*. Jersey, Channel Islands: Wildlife Preservation Trust, .

CONABIO. 2000. *Regiones Prioritarias Terrestres de México.* Mexico D.F., Mexico: CONABIO.

Davidson, A. D., E. Ponce, D. C. Lightfoot, E. L. Fredrickson, J. H. Brown, J. Cruzado, S. L. Brantley, R. Sierra, R. List, D. Toledo, and G. Ceballos. 2010. Rapid response of a grassland ecosystem to an experimental manipulation of a keystone rodent and domestic livestock. *Ecology* (in press).

Di Peso, C. C., J. B. Rinaldo, and G. J. Fenner. 1973. *Casas Grandes, a Fallen Trading Center of the Grand Chichimeca*. Flagstaff, AZ: Northland Press.

Diario Oficial de la Federación. 2009. Decreto por el que se declara como área natural protegida, con el carácter de reserva de la biosfera, la zona conocida como Janos, localizada en el Municipio de Janos, en el Estado de Chihuahua. *Diario Oficial de la Federación* (pp. 9–18). December 8, 2009.

Dinerstein, E., D. Olson, J. Atchley, C. Loucks, S. Contreras-Balderas, R. Abell, E. Iñigo, E. Enkerlin, C. E. Williams, and G. Castilleja. 1998. *Ecoregional-based Conservation in the Chihuahuan Desert: A Biological Assessment and Biodiversity Vision*. Washington, DC: World Wildlife Fund.

Lammertink, J. M., J.A. Rojas Tomé, F. M. Casillas Orona, and R. L. Otto. 1997. *Situación y conservación de los bosques antiguos de pino-encino de la Sierra Madre Occidental y sus Aves Endémicas.* México, D.F., Mexico: Consejo Internacional para la Preservación de las Aves, Sección Mexicana.

Leopold, A. 1937. Conservationist in Mexico. *American Forests* 43: 118–21.

List, R. 2007. The impacts of the border fence on wild mammals. In *A Barrier to Our Shared Environment: The Border Wall between Mexico and the United States*, ed. A. Córdova and C. A. de la Parra (pp. 77–86). México, D.F. Mexico: SEMARNAT, Instituto Nacional de Ecología, El Colegio de la Frontera Norte.

———. 2009. División de un continente: La muralla entre México y Estados Unidos. *Revista Especies* (May–June): 16–22.

List, R., and M. Valdéz. 2009. Diagnóstico de la población del berrendo (*Antilocapra americana*) en la zona colindante entre México y Estados Unidos y sus potenciales afectaciones por el muro fronterizo. Proyecto INE/A1-019/2009. Unpublished technical report presented to the National Institute of Ecology.

List, R., G. Ceballos, C. Curtin, P.J.P. Gogan, J. Pacheco, and J. Truett. 2007. Historic distribution and challenges to bison recovery in the northern Chihuahuan Desert. *Conservation Biology* 21: 1487–94.

List, R., J. Pacheco, and G. Ceballos. 1999. Status of the North American porcupine (*Eerethizon dorsatum*) in Mexico. *The Southwestern Naturalist* 44: 400–404.

List, R., O. Moctezuma, and M. Miller. 1998. What to protect in Chihuahua and Sonora. *Proceedings of the 9th US/Mexico Border States Conference on Recreation, Parks and Wildlife*. Tucson, Arizona, June 3–6.

List, R., P. Manzano-Fischer, and D. W. Macdonald. 2003. Coyote and kit fox diets in a prairie dog complex in Mexico. In *The Swift Fox: Ecology and Conservation of Swift Foxes in a Changing World*, ed. M. Sovada and L. Carbyn (pp. 183–88). Saskatchewan, Canada: University of Regina, Canadian Plains Research Center.

Manzano-Fischer, P., R. List, G. Ceballos,

and J. L. Cartron. 2006. Avian diversity in a priority area for conservation in North America: The Janos–Casas Grandes Prairie Dog Complex and adjacent habitats of northwestern Mexico. *Biodiversity and Conservation* 15: 3801–25.

Manzano-Fischer, P., G. Ceballos, R. List, O. Moctezuma, and J. Pacheco. 2000. Janos-Nuevo Casas Grandes. In *Áreas de importancia para la conservación de las aves en México*, ed C. Arizmendi and L. Márquez Valdemar (pp. 171–72). México, D.F. Mexico: CONABIO.

Manzano-Fischer, P., R. List, and G. Ceballos. 1999. Grassland birds in prairie-dog towns in northwestern Chihuahua, Mexico. *Studies in Avian Biology* 19: 263–71.

McNicoll, J. L. 2005. Burrowing owl (*Athene cunicularia*) nest site selection in relation to prairie dog colony characteristics and surrounding land-use practices in Janos, Chihuahua, Mexico. MS thesis, New Mexico State University, Las Cruces.

Miller, B., G. Ceballos, and R. Reading. 1994. The prairie dog and biotic diversity. *Conservation Biology* 8: 677–81.

Miller, B., R. Reading, J. Hoogland, T. Clark, G. Ceballos, R. List, S. Forrest, L. Hanebury, P. Manzano, J. Pacheco, and D. Uresk. 2000. The role of prairie dogs as keystone species: A response to Stapp. *Conservation Biology* 14: 318–21.

Minnis, P. E., and M. E. Whalen. 2003. The Casas Grandes community. *Archaeology Southwest* 17: 1–3.

Santos Barrera, G., J. Pacheco, and G. Ceballos. 2008. Amphibians and reptiles associated to the prairie dog grasslands ecosystem and surrounding areas at the Janos Casas Grandes Complex, northwestern Chihuahua, Mexico. *Acta Zoológica Mexicana* 24: 125–36.

University of Texas. 2010. *Presidio de San Felipe y Santiago de Janos Records*. Benson Latin American Collection, General Libraries, the University of Texas at Austin. Retrieved on February 16, 2010, from www.lib.utexas.edu/taro/utlac/00083/lac-00083p1.html.

Villa R., B. 1955. Observaciones acerca de la última manada de berrendos (*Antilocapra americana*) en el Estado de Chihuahua, México. *Anales del Instituto de Biología* 26: 229–36.

## Acknowledgments

We thank those who contributed to the establishment of the JBR: M. Alfaro, N. Barajas, S. Castro, E. Enkerlin, P. Manzano-Fisher, C. Nuggent, C. Jaquez, M. Royo, C. Sánchez Ibarra, and T. Sullivan, among many others. We thank those who contributed to research on the JBR: J. M. Kaplan Fund, UNAM-DGAPA, CONACYT, CONABIO, Defenders of Wildlife, the Dutch Embassy in Mexico, Environmental Flying Services, Ecociencia S.C., National Black-Footed Ferret Recovery Foundation, National Fish and Wildlife Foundation, Naturalia A.C., the People's Trust for Endangered Species, Phoenix Zoo, Research Ranch Foundation, U.S.A.I.D., U.S.F.W.S., Sky Island Alliance, the British Council, The Nature Conservancy, the Wildlands Project, T&E Inc., the Turner Foundation, and the Wildlife Conservation Research Unit.

RURIK LIST is a carnivore and conservation biologist, whose work focuses on research and implementation of the conservation of carnivores and threatened species and their habitats; he is an associate professor at the Instituto de Ecología from the Universidad Nacional Autónoma de México; email: rlist@ecologia.unam.mx.

JESÚS PACHECO is an ecologist and conservation biologist from the Universidad Nacional Autónoma de México. His interests are in animal ecology, conservation biology, and reintroduction species of vertebrates; email: jpacheco@ecologia.unam.mx.

EDUARDO PONCE is a doctoral student at the Universidad Nacional Autónoma de México. His focus is on restoration and conservation of grassland ecosystems; email: reysahuaro@yahoo.com.

RODRIGO SIERRA-CORONA is a doctoral student at the Universidad Nacional Autónoma de México, and he is focused on the current environmental conditions of Mexican landscapes to understand the causes of degradation and to design long-term restoration and conservation strategies; email: lomogrande@hotmail.com.

GERARDO CEBALLOS is a professor at the Instituto de Ecología, Universidad Nacional Autónoma de México. He started research in Janos in 1988 and is one of Mexico's leading conservationists and most prolific ecologists, with more than 200 scientific and outreach papers and 10 books; he has been involved in the creation of many protected areas including the first private biosphere reserve in Mexico; email: gceballo@ecologia.unam.mx.

# Announcements

COMPILED BY GREG KROLL

## *IJW* Considers Online Publication Options

For several years we've received suggestions that *IJW* consider publishing online either exclusively or in addition to some combination with our current hardcopy publication. Recently we polled the *IJW* editorial board about the online option and received unanimous encouragement to explore online options, and many good suggestions and helpful information about how to do it.

No final decision has been reached, but we are now actively evaluating options for *IJW* with our financial sponsors, in particular The WILD Foundation and Fulcrum Publishing, as to the pros and cons of various online options and methods. Besides the importance of financial feasibility, our most important criteria in this evaluation will be serving our dedicated purpose of linking wilderness professionals, scientists, educators, environmentalists, and interested citizens worldwide with a forum for reporting and discussing wilderness conservation and stewardship around the globe. Chad Dawson, *IJW* managing editor and John C. Hendee, *IJW* editor-in-chief.

## The Society for Wilderness Stewardship—New Organization Invites Membership

It's been 46 years in the making. Wilderness rangers, managers, researchers, educators, government and private conservation workers, volunteers, students, and the public have asked for years why wilderness does not have a professional society like other resource disciplines such as wildlife, range, and forestry? Finally, its time has come. For like-minded wilderness stewards, now is the time to join a growing community to advance a profession of wilderness stewardship.

As a member-based organization, the Society for Wilderness Stewardship (SWS) seeks to include diverse people dedicated to wilderness stewardship, including rangers, managers, scientists, educators, volunteers, and nongovernment conservation staff members. SWS believes this community shares a passion for wilderness and a deep-rooted sense of the intrinsic value of its benefits. SWS is committed to uniting the stewardship, management, and scientific communities to explore and address wilderness stewardship issues.

SWS's vision is that the values and benefits of the National Wilderness Preservation System are understood, treasured, and preserved by all people and that stewards of wilderness have the resources to ensure continuation of its benefits.

SWS is governed by up to a 21-member board of directors led by four officers: chair, vice-chair, secretary, and treasurer. Organizational leadership includes federal wilderness agency liaisons representing the USDA Forest Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Arthur Carhart National Wilderness Training Center, and Aldo Leopold Wilderness Research Institute. Current officers include:

Chair: Don Hunger, Student Conservation Association, associate vice-president for agency affairs; email: donhunger@thesca.org

Vice-chair: Ben Lawhon, Leave No Trace Center for Outdoor Ethics, education director; email: Ben@LNT.org

Treasurer: Roger Semler, retired National Park Service, Montana State Parks, assistant administrator; email: wildpro@q.com

Secretary: Dr. C. "Griff" Griffin, Grand Valley State University, Biology Department; email: griffinc@gvsu.edu

How to get involved: become an individual or organizational member, make a donation, join the board or a committee, join the mailing list to stay informed, and spread the word about the society. Address correspondence about the SWS and membership to: Society for Wilderness Stewardship, P.O. Box 2667, Bellingham, WA 98227.

Submit announcements and short news articles to GREG KROLL, *IJW* Wilderness Digest editor. E-mail: wildernessamigo@yahoo.com

## Conservation Icon Stuart Udall Dies

Stuart L. Udall, one of the most pivotal figures in annals of American conservation, died March 20, 2010, at his home in Santa Fe, New Mexico, of complications from a recent fall. He was 90. During the eight years that Udall served as secretary of the interior under Presidents John F. Kennedy and Lyndon B. Johnson, he helped secure passage of the Wilderness Act (1964), the Land and Water Conservation Fund Act (1965), the Water Quality Act (1965), the Endangered Species Preservation Act (1966), the National Historic Preservation Act (1966), and the Wild and Scenic Rivers Act (1968). He was the last surviving member of President Kennedy's original cabinet. He also oversaw the creation of Guadalupe Mountains National Park, Texas; North Cascades National Park, Washington; Canyonlands National Park, Utah; Cape Cod National Seashore, Massachusetts; and Point Reyes National Seashore, California. He narrowly thwarted an effort in the late 1960s to build dams on the Colorado River within the Grand Canyon. "My own people from Arizona were desperate to build these dams," he told National Public Radio in 1996. "Some of them still dislike me because I helped stop the construction of these dams."

As a young man, Udall attended the University of Arizona, spent two years on a Mormon mission on the East Coast of the United States, then served as a B-24 gunner in the Army Air Force during World War II. "I grew up on the tail of the frontier," he told the *Arizona Daily Star* in 2005. "I plowed fields with horses and worked as a hired hand in high school for 50 cents a day." Beginning in 1978, Udall spent years probing the reasons for high rates of cancer among people who had lived near nuclear test sites in the 1950s and 1960s. After more than 20 years of effort, he helped draft the 1990 Radiation Exposure Compensation Act, which offered reparations to the families of cancer patients affected by atomic radiation.

Ever the outspoken conservationist, Udall wrote that "The [George W.] Bush administration, determined to ransack public lands for the last meager pockets of petroleum, has turned my old department into a servile, single-minded adjunct of the Energy Department." Reflecting on the legacy of the Wilderness Act, he considered the act to be "something more than a law. It is an outward expression of the maturing of our national character.… [It is] a profound cultural statement: With it the American people articulated a distinct point of view about the natural world and our relationship with it. We demonstrated that there are some things whose value is too large to be measured with dollars." (Sources: *The Washington Post,* March 21, 2010; *Los Angeles Times,* March 21, 2010; www.wildernesswatch.org)

## Steve Bair Is Honored With Wes Henry Award

Steve Bair, wilderness and trails Manager at Shenandoah National Park, Virginia, was recently recognized by National Park Service director Jon Jarvis with the Wes Henry National Excellence in Wilderness Stewardship Individual Award for 2009. Steve was commended for his leadership in initiating, coordinating, and writing Shenandoah's first Backcountry-Wilderness Management Plan. He guided the plan's development with an interdisciplinary team and public involvement, and coordinated wilderness social science research in the park with Virginia Tech. The resulting visitor study influenced the management plan and established a framework for future management actions. Steve also initiated a Leave No Trace program at the park, integrating wilderness into all aspects of park management, setting standards for wilderness trail maintenance, and developing a strong partnership with a local trail club to ensure the use of traditional tools on wilderness trails. In recognition of his achievements, Steve received a commemorative sculpture and a monetary award. (Source: Office of the Director, National Park Service)

## Organ Pipe Cactus National Monument Garners National Recognition

The staff at Organ Pipe Cactus National Monument, Arizona, has been recognized repeatedly for their outstanding contributions to wilderness stewardship. They are the latest recipients of the National Park Service's (NPS) Wes Henry National Excellence in Wilderness Stewardship Group Award, the Intermountain Region's Wilderness Champions Award, and a commendation from the U.S. House of Representatives.

Sharing its southern boundary with Mexico, 93% of the monument's 331,000 acres (134,000 ha) is designated wilderness. Until the 1970s, much of the preserve's land was used for ranching and mining. According to the Honorable Raúl. M. Grijalva's statement before the House of Representatives, "Catching up with the damage done during these times has proven to be the stimulus for all the wonderful projects taken on by the employees at Organ Pipe.… [The monument's Ecological Monitoring Program] has been diligently working since 1997 to monitor and evaluate critical aspects of the region…reporting

changes in the ecosystem [and] documenting damage to the land by neighboring developers."

NPS director Jon Jarvis, in bestowing the National Excellence in Wilderness Stewardship Group Award, stated that the park's commitment to wilderness was "severely tested" in 2009. The Department of Homeland Security (DHS) proposed to build 33 electronic towers in and adjacent to the monument, several in the designated wilderness. Park staff worked with DHS and other agencies to reduce the number of towers from 33 to 11, none of which are located within wilderness. In addition, according to Jarvis, "staff continues to reduce and mitigate impacts of the towers and other DHS proposals by providing comments on letters, plans and compliance documents, and [they] often meet in the field to discuss site-specific mitigation measures and requirements.… The wilderness program at Organ Pipe Cactus National Monument represents a considerable team effort...[and] is an outstanding model for others to follow." (Sources: Office of the Director, National Park Service; *Congressional Record,* February 25, 2010)

## Judge Rejects Suit to Block Helicopter Landings

Federal District Judge B. Lynn Winmill cleared the way for Idaho state biologists to land helicopters in the Frank Church-River of No Return Wilderness up to 20 times in early 2010 to dart and radio-collar wolves (see *IJW* Digest, April 2010). The U.S. Forest Service had issued a special use permit approving the flights in December 2009, based on Idaho's claim that the project would yield valuable new data about wolf behavior, denning sites, and migratory patterns. Environmentalists from seven different organizations subsequently filed a lawsuit seeking to block the landings, claiming they would violate the provision of the 1964 Wilderness Act prohibiting motorized vehicle use in wilderness. The plaintiffs also claimed that the federal government issued the permits without doing a thorough environmental analysis.

While recognizing the dilemma of allowing backcountry helicopter landings, Judge Winmill ruled the limited intrusions are designed to help wolves, whose presence is an important component of the wilderness's character. "The use of helicopters for any other purpose would be extremely difficult to justify under the Wilderness Act," the judge wrote in his 12-page ruling. "Given that this project is allowed to proceed, the next project will be extraordinarily difficult to justify." (Source: Associated Press, February 19, 2010)

## African Union Decision May Create Legal Precedent

Nearly four decades ago the Kenyan government confiscated the ancestral lands of the Endorois people to create a national game reserve, and 60,000 people were forced to leave. Lake Bogoria, 160 miles (260 km) northwest of Nairobi, has the largest number of geysers in Africa and is famous for its hot springs and abundant wildlife, including flocks of pink flamingos. "They came around 11 in the morning armed with guns and tear gas canisters. It was like they had come for war. Within a day and without notice, we were all chased away," Job Kiprotich said of the 1973 evictions. "We lost relatives, grazing land, our livestock, our heritage and most importantly, we lost our home."

The African Union (AU) has approved a decision by the African Commission on Human and People's Rights (ACHPR), which found the Kenyan government guilty of violating the rights of the Endorois by evicting them from their land. The ACHPR accepted the Endorois' evidence that they had lived in the area surrounding Lake Bogoria since "time immemorial" and the lake was the center of their religion and culture, with their ancestors buried nearby. The ruling states that the Kenyan government must allow the Endorois unrestricted access to the lake and surrounding sites for religious and cultural rites, and for herding their cattle. In addition, the government will be required to pay adequate compensation to the community for losses suffered, pay royalties to them from existing economic activities, and ensure that they benefit from employment possibilities within the reserve.

Kenya acknowledged the AU's jurisdiction in 1992. According to the *Daily Nation*, the ruling creates a major legal precedent by recognizing for the first time in Africa the rights of indigenous peoples over traditionally owned land. (Sources: *Daily Nation* [Kenya], February 9, 2010; Associated Press, February 19, 2010)

## Court Nixes Challenge to Motors in the Grand Canyon

Four environmental organizations challenged the National Park Service (NPS) in court for violating its own policies and federal laws by authorizing the continued use of motorized activities in the Colorado River corridor, a 277-mile (445 km) stretch of river in Grand Canyon National Park, Arizona. In 2006, the NPS adopted a management plan allowing motorized rafts, generators, and helicopters in the corridor. However, the River Runners for Wilderness, Rock the Earth,

Wilderness Watch, and Living Rivers failed to make their case before the 9th Circuit Court. The environmental groups argued that the management plan is "arbitrary and capricious" under the Administrative Procedure Act (APA) because it violates the Park Service's own policies, including the duty to treat the corridor as wilderness or potential wilderness.

The District Court ruled, and the 9th Circuit agreed, that the NPS can choose to "waive or modify" its own policies, and that its policies "are not enforceable against the Park Service in this action." The 9th Circuit stated that the NPS "quite clearly concluded that motorized commercial services were 'necessary and appropriate for public use and enjoyment' of the corridor." (Source: www.courthousenews.com, February 1, 2010)

## PAN Parks Publishes "Best Practices of Wilderness Management"

PAN Parks, the European wilderness protection organization (see *IJW* Digest, April 2008), has published *As Nature Intended: Best Practice Examples of Wilderness Management in the Nature 2000 Network*. This document, which can be downloaded in its entirety, presents 11 best-practice management examples from various European national parks, and from a variety of habitat types. According to a PAN Parks press release, "Through this collection we demonstrate that wilderness management approaches and techniques such as non-intervention...may play a crucial role in the management of protected areas in Europe, and that they are applicable approaches...where the major objective is to protect ecosystem dynamics." (Source: www.panparks.org/newsroom/news/2010/jan_as_nature_intended)

## British Columbia Prohibits Mining in the Flathead River Headwaters

In a huge victory for the environment, the lieutenant governor of British Columbia (BC), Canada, has announced that the province will not allow mining in the Flathead River Valley just north of Glacier National Park, Montana, and due west of Waterton Lakes National Park, BC. The two parks together form the Waterton-Glacier International Peace Park, established in 1932. For years, environmental groups in Canada and the United States have been fighting projects to mine coal, coal-bed methane, and gold in the Canadian Flathead Valley. That pressure convinced UNESCO's World Heritage Committee to send a team of experts to the area in November 2009 to determine what impact mining might have on the two parks, both World Heritage sites. In their report, the field team determined that mining would harm both areas.

The Waterton-Glacier International Peace Park protects an important biological crossroads at the point where the Rocky Mountains reach their narrowest width. With its resident grizzly bears, wolves, elks, lynx, mountain goats, wolverines, bull trout, and Westslope cutthroat trout, the area has been described as the single most important basin for carnivores in the Rockies.

The state of Montana has also agreed to protect the watershed south of the Canadian border. Montana governor Brian Schweitzer and British Columbia premier Gordon Campbell signed a two-page agreement committing the province and state to "prohibit the exploration for and development of mining, oil and gas, and coal in the British Columbia Flathead and the Montana North Fork Flathead River Basin, such action to be completed by July 2010." The agreement covers nearly 5.7 million acres (2.3 million ha). Existing logging and timber operations will be retained in both the state and province, and the agreement stops short of recommending any part of the area as a new national park or World Heritage Site. Schweitzer and Campbell were joined by leaders of the Confederated Salish and Kootenai Tribes of Montana and the Ktunaxa Nation of British Columbia, who cosigned the agreement as witnesses. (Sources: *National Parks Traveler*, February 10, 2010; *Missoulian*, February 19, 2010)

## Dinosaur National Monument Does It Right

It took a while, but crews at Dinosaur National Monument, Colorado and Utah, removed several collapsing, 1960s-era structures from recommended wilderness using only hand tools and muscle power. The structures, located in the Jones Hole area of the monument, were about 4 miles (6.4 km) from the nearest road, but only a quarter mile (0.4 km) from the Green River. With the goal of restoring wilderness character to the landscape, staff demolished the buildings and cut the pieces into short lengths. The pieces were then floated by raft on the Green River to a point outside the recommended wilderness area. Fourteen monument staff from the ranger, maintenance, and resource management divisions worked on the project during the summer of 2009. Thirty-four trips, many using multiple rafts, were needed to remove the materials.

In recognition of their work, the staff received an Intermountain Region Wilderness Stewardship Award, which recognized that the project stood out as a great example of applying the

minimum tool in the true sense, and utilizing teamwork and interdisciplinary cooperation. (Source: www.nationalparkstraveler.com, February 9, 2010)

## Yosemite Launches Wilderness Outreach Campaign

Wilderness managers at Yosemite National Park, California, determined that in order to effectively educate current and potential wilderness users, park publications needed to be updated to target specific wilderness audiences: stock users, rock climbers, winter recreationists, backpackers, and visitors from California's Central Valley, who often have had little exposure to wilderness ethics. These varied audiences have typically gleaned their information from a range of sources.

According to Pam Meierding of Yosemite's Wilderness Outreach and Education Office, a set of brochures and postcards, incorporating beautiful photography and quotations, were developed to convey the idea that wilderness is a fun and magical place in which visitors can picture themselves. Once people are drawn in with photos, quotes, maps, and specific permit information, they become more involved in reading the Leave No Trace and safety messages.

The brochures are pocket-sized so they can be put in backpacks or pockets and carried on the trail. Information is provided in bite-sized chunks with photos of "Dos and Don'ts" in order to be more universally understood. The postcards, two of which are designed for mailing, are used at outreach events. They include a 10% discount coupon for use at Yosemite Association bookstores in the park. It is hoped that the postcards are inspiring enough that people will want to keep them. All publications are printed on recycled paper using soy-based inks. (Source: Wilderness Outreach and Education Office, Yosemite National Park, www.nps.gov/yose)

## More Products of Concern to Wilderness Managers

A seemingly endless array of devices designed to circumvent the concept of wilderness-based freedom and adventure are appearing on the market.

The Dixon Rollerpack is advertised as "an old concept brought back to modern days. One hundred fifty years ago the plain [*sic*] Indians used a device called a travois.… As times have changed the new travois uses materials such as aluminum tubing and a ball bearing wheel." It's essentially a backpack with a wheel on the bottom. "This new idea makes your hiking experience half the weight, twice the fun." According to the Dixon folks, the Rollerpack is ideal for traveling on all established trails, and it can easily go over rocky, sandy, and muddy terrain. With the ski attachment, it even navigates over snow. For those hardy souls seeking off-trail adventures, the Rollerpack can be converted into an external frame backpack in less than a minute.

And then there's Bourne Energy's portable hydroelectric generator. According to EarthTechling, "In life, there are rugged outdoorsmen who eagerly head into the wilderness armed with only their wits and the pack on their back. Then there are the rest of us, those who depend on a heavy knapsack of batteries to power their lifelines to civilization while we're huffing and puffing our way across nature trails." The Backpack Power Plant Type-2 solves the problem. Weighing less than 25 lbs. (11 kg), it is capable of "quietly" generating 600 watts from a stream or river at least four feet (1.2 m) deep. To install the generator, the user digs a trench on either side of the stream for two lightweight anchors. A rope connects the anchors to the generator, keeping it afloat through tension. A lighter, more powerful version is available for military use. Civilian models cost around $3,000. (Sources: dixonrollerpack.com/3327.html; www.earthtechling.com/2010/03/backpack-power-plant-provides-portable-hydroelectric-power-to-go/)

## Canadian Court Upholds Right to Public Participation

On January 21, 2010, the Supreme Court of Canada ruled that the Canadian government acted unlawfully when it conducted a brief and piecemeal environmental review of the Red Chris Mine, a proposed open-pit copper and gold mine in a remote part of British Columbia. Ecojustice and MiningWatch Canada successfully argued that environmental authorities are required to conduct a comprehensive environmental assessment with full public participation, and that they can no longer split proposed projects into small parts to avoid triggering the more rigorous environmental assessment required for major projects. From now on, the Canadian government must treat any proposed project as a whole, and allow the public to have its say before finalizing the evaluation. The ruling brings Canadian law more in line with international legal standards, although it only applies to future environmental assessments, not the Red Chris Mine project. (Source: www.aida-americas.org)

# Book Reviews

### *Ecology of Fragmented Landscapes*

By Sharon K. Collinge. 2009. John Hopkins University Press. 340 pages. $70.00 (hardcover).

Reviewed by KRYSTIN ST JEAN, a senior student in the Outdoor Recreation and Tourism Management Program at the University of Northern BC, Prince George, BC; email: stjean@unbc.ca.

Over the last few decades, the subdisciplines of conservation biology and landscape ecology have generated a large and dynamic literature. This research is increasingly applied to wilderness management, as increased urbanization and development taking place in and near wilderness areas has created severely fragmented landscapes at the local, regional, and continental scale. *Ecology of Fragmented Landscapes* draws together the considerable literature in several related fields such as landscape, community, and population ecology to create a concise synthesis of the considerable literature in these disparate areas.

Collinge begins by focusing on the early theories and models of conservation biology and landscape ecology (e.g., island biogeography and metapopulations). She then moves into newer, more complex theories and concepts (e.g., species interactions, disease ecology, and restoration) and the impacts of fragmented landscapes on landscape function and processes; these concepts are also connected back to the foundational theories.

The end of the book is "meant to be more hopeful, focusing on restoration and conservation planning, two sets of approaches that may help to connect the pieces of fragmented landscapes into a functioning whole" (p. 18). As Collinge notes near the end of the book, "My hope is that those who read this book will find…motivation that will inspire action…. It is that kind of hopeful, forward thinking act—to ensure Earth's viability—that must propel us forward" (p. 279).

Collinge has written this book for a variety of audiences, including undergraduate and graduate students in the field, nature enthusiasts, and professional ecologists who "want to know the state of knowledge about habitat loss and fragmentation" (p. 16). Although the book does not offer new concepts or theories, it does an extraordinary job of consolidating the wealth of available information into one resource. An extensive reading list offers readers an excellent starting point for future study or research.

Overall, this book is highly recommended for those teaching, studying, or working in wilderness conservation and natural resource management. With human activities further isolating and fragmenting what little wilderness there is left, *Ecology of Fragmented Landscapes* helps us understand the ecological consequences of these actions. Furthermore, it offers suggestions on how to "work toward successful efforts to protect and re-assemble natural ecosystems" (p. 273). This book is an excellent summation of a somewhat "fragmented" literature on a subject critical to the present and future conservation of global wilderness.

### *The Nurture of Nature: Childhood, Antimodernism, and Ontario Summer Camps, 1920–1955*

By Sharon Wall. 2009. UBC Press. 392 pages. $85.00 (hardcover) /$32.95 (paperback).

*The Nature of Nurture* explores the "entanglement" (p. 257) of modernity and anti-modernity within summer youth camp culture in Ontario, Canada. Wall argues that although camps were meant to provide an escape from modern urban culture and a return to a simpler life in natural settings, they often reinforced "modern ways of thinking and feeling about numerous aspects of society, the self, and racial others" (p. 256). She examines these complexities of summer camps through the critical lenses of geography, class, gender, sexuality, and race.

In chapter one, Wall discusses how modernity changes both physical landscapes and our *thinking* about space. She notes that landscapes were often categorized dichotomously (e.g., good/bad, healthy/unhealthy, natural/artificial). The landscapes of summer camps—so-called "natural" or "wild" spaces—were considered to be rugged, tranquil, pure, and geographically isolated from the artificiality, squalor, and consumerism of cities, making them the perfect antidote to the perceived

perils of modern urban lives. Wall argues that although camps sought out anti-modern geographies that were "wild" and "natural," they immediately modernized these areas by "taming" wild spaces. Furthermore, Wall suggests the concepts of "wilderness," "nordicity," and "pristine nature" separated humans from nature.

Next, Wall suggests the modern/anti-modern tensions of summer camp enacted and created social norms. Camps are seen as tools of social class formation, and three genres of summer camps are distinguished: the elite private camps, agency-run camps, and charity camps. She argues that private camps imbued elite youth with the social capital necessary to become well-connected, influential citizens. In contrast, the charity camps, often run by middle-class health and social work professionals, sought to promote health among vulnerable youth and "rehabilitate" the working class by providing middle-class values.

In chapter four, Wall considers the shift in camping from recreation to socialization and identifies a resulting tension between the rigid efficiency and holistic freedom that characterized camp life. Chapter five suggests that gender and sexual norms were reinforced at camps, informed by tensions between masculine ruggedness/feminine civility, gender segregation, and liberal feminism. Finally, chapter six examines the racialized, anti-modern phenomenon of white people "playing Indian." Wall argues that this romanticized, colonial appropriation of aboriginal culture was a cathartic response to growing dis-ease with the pace of social change.

*The Nurture of Nature* is extensively researched and well written. Wall capably discusses contradictions and tensions in a way that preserves richness and complexity, yet does so within a highly readable, well-organized structure. She provides just the right amount of background information about broader, relevant, sociocultural histories to allow readers to easily understand the significance and context of her arguments. Wall also conveys a genuine respect for camp participants and consistently strives to honor their experiences, often in their own words.

Wall's book makes a significant contribution to a range of academic fields, including human geography, outdoor/environmental education, leisure/recreation, and critical studies. Beyond academia, this book could also capture the interest of all those who contemplate competing conceptualizations of wilderness and society or who have personal experiences with summer camp culture in Ontario and beyond.

Reviewed by EMILY ROOT, Ph.D. student and environmental education instructor, Faculty of Education, Lakehead University, Thunder Bay, ON, Canada; email: eroot@lakeheadu.ca.