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- Fees For Wilderness Use
- Wilderness Hydrology
- India, South Africa



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Front cover photo of Fever Trees surrounding the Ndumo Pan at the Ndumo Game Reserves in KwaZulu Natal, South Africa. Inset photo: local community employment is a major factor in wildland sustainability, a guide from KwaZulu Natal, South Africa. Both photos © 2001 courtesy of Ulf Doerner.

International Journal of Wilderness

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

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EDITORIAL PERSPECTIVES

Wilderness Stewardship

BY CHAD P. DAWSON

If future generations are to remember us more with gratitude than with sorrow, we must achieve more than just miracles of technology. We must also leave them a glimpse of the world as it was created, not just as it looked when we got through with it.

—President Lyndon Johnson


upon signing the 1964 Wilderness Act

The remarkable progress of wilderness preservation in the United States would probably impress many of the wilderness visionaries who inspired us to this achievement. The National Wilderness Preservation System currently has more than 105.7 million acres under management by four federal agencies. The popularity of wilderness continues to grow, and in 2000 more than 14.3 million wilderness recreation visits were reported on just the U.S. Forest Service's 34.7 million acres of wilderness. However, with the needs and demands of the more than 285 million people in the U.S. population and more than 6 billion people worldwide, there are and will be increasing threats to wilderness.

What will there be in resource, experiential, and management conditions of wilderness for future generations to appreciate and enjoy? How can we steward these resources to maintain or improve the natural conditions and processes while still providing benefits to society? In this issue of the *IJW*, some of the stewardship issues are addressed, and they alert us to the challenges we face if we are to provide wilderness for present and future generations.

IJW Editor-in-Chief John Hendee and I identify and describe 17 categories of threats to wilderness. Rich Hanson and Jim Mahoney give examples of restoration approaches in the Maricopa Complex Wilderness of Arizona. Catherine Pringle issues a call to better understand and manage water resources because of the ecosystem and resource connections within wilderness and from adjoining lands and watersheds. Roger Rufe warns of the need to create aquatic wilderness areas since the majority of the Earth is water and not land.

One threat to wilderness is providing adequate funding to support wilderness management and stewardship. This issue of *IJW* presents a forum of views about one effort to address this—the Recreation Fee Demonstration Program. Begun in 1995 and later extended into 2001, “Fee Demo” authorizes the National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and USDA Forest Service to collect new user fees at selected sites, and to use the revenues in recreation programs and at the sites where they are collected for on-the-ground improvements.

The *IJW* neither supports nor opposes the Recreation Fee Demonstration Program. Our goal is to provide a forum for various points of view on this and other controversial wilderness issues. Alan Watson reviews some of the pertinent research literature. David Brown expresses concerns about the implementation of the program. Derrick Crandall offers a supportive statement about the use of recreation fees, and information is presented from some selected Fee Demo opposition websites around the U.S. 

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Article author Chad P. Dawson.

Stewardship to Address the Threats to Wilderness Resources and Values

BY JOHN C. HENDEE and CHAD P. DAWSON

Wilderness resources and values are becoming scarcer every year as they are lost to urban sprawl, roads, resource extraction, human development and intrusions from inhaling landowners, global influences, and more; and even well-meaning stewardship may dilute or impact wilderness. In the future wilderness may represent the only remnants of many ecosystems, wild conditions, and opportunities in which to experience solitude and natural landscapes. The degree to which those qualities remain in wilderness tomorrow will reflect our stewardship efforts to deal with the threats to wilderness reviewed here, and more.

We define threats to wilderness here as a general concept, focusing on change agents or processes that negatively or adversely impact wilderness resource conditions and values, as noted by Landres et al. (1998a). We are talking about change agents that come directly or indirectly from human influences and not natural disturbances (e.g., lightning-caused fires, volcanoes, hurricanes, etc.). For example, increasing visitor use of wilderness areas (i.e., a change agent) can impact wilderness experiences through resulting crowding, visitor conflicts, loss of solitude, and from direct impacts on wilderness resources such as loss of vegetative ground cover at campsites, and soil erosion on trails.

We identify 17 categories of threats to wilderness and their impacts, drawing

upon relevant literature and our experience and discussions with wilderness users, managers, and researchers. Some threats represent inevitable, though lamentable, global or local change, but for other threats wilderness stewardship can often make a difference. When it can, we urge wilderness managers to exercise the strongest possible protective or mitigating action.

1. **Fragmentation and isolation of wilderness as ecological islands** disconnect them from surrounding natural habitat so they may not be wholly functioning ecosystems. The 600-plus units of the National Wilderness Preservation System (NWPS) tend toward smaller units (42% are from 10,000 to 50,000 acres) rather than larger units (four wildernesses in Alaska include more than



Article coauthors John C. Hendee (left), photo by Marilyn Riley, and Chad P. Dawson, photo courtesy of Chad P. Dawson.

5 million acres) (Landres and Meyers 2000). The lack of large or “corridor connected” wilderness units most pronounced in the eastern United States often creates ecological “islands” more vulnerable to external and adjacent forces than areas of a million acres or more. Beyond limiting the seasonal migrations of wilderness fauna, small units may limit the mixing of flora and fauna species populations, so essential to genetic diversity and upon which their long-term health and survival depends. Some wilderness species require large undisturbed home ranges, such as wolves and grizzly bears. How to combat fragmentation and isolation of wilderness? We need comprehensive wildland management that maintains wild corridors between small wilderness areas and a wilderness designation strategy that expands and connects areas.

2. **The loss of threatened and endangered species**, and sometimes intrusive actions to save them, can threaten wilderness naturalness and solitude. While the protection of threatened or endangered species may require special efforts, including mechanical intrusions into or manipulation of the wilderness environment to favor them, such well-intentioned and legal activities may cause other impacts. We must ask how much is enough, and try to stick with the minimum, necessary tools. For example, are efforts to protect bighorn sheep in the Cabeza Prieta and other wilderness areas by providing water structures and hauling water actually necessary? Are they a justifiable intrusion on other wilderness resources and values? Are they trying to support unnaturally high sheep populations?



Threats to wilderness resource conditions or visitor experiences stem from a variety of sources, such as heavy recreation use or congestion on mountain summits and overlooks. Photo by Chad Dawson.

3. **Increasing commercial and public recreation visits** cause impacts forcing managers to increasingly regulate and control use. Recreation use and visitor management are already intense in some high-use locations, in the more popular wilderness areas, and in some places, times and seasons—even in large and remote areas. So the impacts of both commercial and recreation use and efforts to control them may threaten wilderness resources and values (Cole 2000). Clearly, preserving wilderness naturalness and solitude requires visitor regulation in many places, though admittedly such regulation takes away the freedom and spontaneity that characterize wilderness experiences. It is a continuing balancing act, weighing the need to regulate use to control impacts against the impacts of visitor management on freedom and spontaneity of user experiences and the loss of wilderness opportunities for those turned away or limited.
4. **Livestock grazing** by domestic cattle and sheep and recreational pack stock is legally allowed in wilderness where it existed prior to Wilderness designation, but it is often a threat to naturalness and impacts user experiences. Permitting grazing in wilderness was a compromise that was politically necessary to achieve passage of The Wilderness Act (TWA), but it impacts soil and water, and the consumption and trampling of vegetation may directly impact competing wildlife or change the composition of the forage base, which may further impact wildlife (Murray 1997). The presence of domestic livestock also encourages predator control and may discourage programs for the recovery of endangered predators such as wolf and grizzly bear. We must respect the legality of grazing in wilderness, but we need tighter regulation of grazing in wilderness to limit its impacts.
5. **Exotic and nonnative species** are increasingly invading wilderness



Installation, maintenance, and monitoring of wilderness boundary signs is an important management challenge. Photo by John Hendee.

ecosystems, impacting naturalness, triggering ecosystem changes, and displacing native species. For example, noxious weeds such as knapweed, star thistle, cheat grass, leafy spurge, and others have outcompeted native species and are rapidly spreading in wilderness (Asher and Harmon 1995). Control efforts are not benign either, as secondary impacts may result from biological, chemical, or physical control mechanisms, and they may not work. The invasion of wilderness by nonnative species, especially noxious weeds, is a very serious threat to wilderness naturalness. What to do? This is a complex dilemma for wilderness managers, with no easy answers that work. But when considering control options, first do no harm.

6. Excessive administrative access, facilities, and intrusive management can threaten naturalness and wilderness values (also see numbers 12 and 14). Mechanized access to wilderness by managers is legal under TWA when it is the minimum

method to accomplish a legitimate and necessary wilderness or endangered species purpose, including facility construction and maintenance. Such management may be in support of any legitimate wilderness purpose, such as visitor management, grazing, mining, commercial outfitting, maintaining historic structures, or trail construction. Recent wilderness designation laws, like the California Desert Protection Act of 1994 (P.L. 103-433), expanded management access by providing for mechanized intrusions to support fish and wildlife management (not just endangered species) and law enforcement in the 69 BLM wilderness areas it established. With mechanized access to wilderness so easily justified, management restraint and judgment is especially important in not abusing the privilege. We still need to ask: is mechanized access really necessary? Is it the minimum tool that will work?

7. Adjacent land management and use can impact wilderness and is

a concern for managers because they often have little or no control over what happens beyond the wilderness boundary (Landres et al. 1998b). A survey of U.S. wilderness managers in 1995 reported 60 different perceived impacts that adjacent land uses had on the wilderness (Kelson and Lillieholm 1997); the top five were: fire management, military overflights, exotic plant introduction, air pollution, and off-road vehicle use. Wilderness managers need to expand their awareness, communication, and educational efforts beyond wilderness boundaries and seek better coordination of adjacent land management activities to minimize their impacts on wilderness.

8. Inholdings of private or public lands within wilderness areas can create impacts because inholders have a right to reasonable access and use of their lands. Some inholdings contain historic impacts, such as old mining claims or homesteads, others serve as active ranches or private retreats, giving their owners prime access to wilderness surroundings. Sometimes motorized access is granted to inholders on primitive roads, by aircraft, or by boats. Inholdings may be used by commercial outfitters and provide sites for supporting facilities and services (e.g., stock facilities, aircraft landing fields), access (e.g., interior private roads), and visitor facilities (e.g., outfitter camps, private dwellings). Wilderness managers need courage here to stand as firm as possible against nonconforming activities taking place on inholdings. A current example is a proposal by an inholder in California's arid Palen McCoy Wilderness to build an access road to haul a large telescope and well-drilling equipment, all to

support private retreats to the site. We (the wilderness community) can help managers by responding to agency Notices of Proposed Actions (NOPAs) in wilderness with objections to intrusive proposals and insistence that their impacts be minimized.

9. Mining and extraction from established claims is allowed in wilderness, although further mineral exploration has been phased out under TWA. For example, oil development is being considered in Alaska and silver mining on existing claims near the Cabinet Mountains Wilderness in Montana. The negative impacts of mining to wilderness naturalness and wildness are extensive. Even old mines that have been “played out” may continue to impact wilderness with their residual buildings, junk heaps, mine tailings, and roads that continue to erode and which invite vehicle trespass, not to mention the visual and ecological impacts of these historical remnants. Managers need public support for imposing conditions as strict as possible on current mining operations, and public participation in efforts to clean up the messes left at old mining sites, such as public lands day cleanup projects and other volunteer rehabilitation efforts.

10. Wild land fire suppression, adjacent to and inside wilderness, is changing ecosystems by reducing natural fire frequencies, leading to changes in ecosystem structure and composition. Allowing natural processes like fire to continue to function in their natural role in wilderness ecosystems and landscapes is now recognized as important to providing diversity and natural variation. But the tendency is for federal agencies

to suppress most fires, in part because of the fear and risk that they would spread to adjacent, non-wilderness lands and, in part, because of political pressure to suppress them. The massive stand-replacing fires that have occurred in recent years (in 2000 more than 6 million acres burned in 80,000 wildland fires) are confirming that past fire suppression allowed tremendous fuel loads to build up, contributing to today’s larger and more intense wildfires. Wilderness has not been immune from this fuel buildup. Difficult as it is and will be, restoring natural fire regimes in wilderness is important to the integrity of wilderness ecosystems.

11. Polluted air is a threat to wilderness naturalness because of its physical and biological impacts and the accompanying reduced visibility that may impact wilderness experiences. Bell et al. (1985) have reported that visual impairment from pollution can cause visitors to change trip schedules or to choose another location that has better vis-

ibility. In the eastern United States, acid rain from industrial and urban emissions can be especially harmful to high-elevation ecosystems. In the West, in 1996 the U.S. Forest Service (USFS) notified the state of Washington that visibility in the Alpine Lakes and Goat Rocks Wilderness areas was adversely impacted by a coal-fueled power plant in Centralia, Washington, and subsequently a mediated settlement for

air quality improvement was completed (Stokes 1999). The air quality in wilderness serves as an important indicator of overall ambient air quality, and this connects wilderness to concerns of the larger society. Wilderness’s role in monitoring air quality for the nation provides an excellent opportunity to explain how wilderness serves everyone, even those who will never go there.

12. Water storage facilities require the legal reconstruction and maintenance of dams and reservoirs in wilderness for water storage, thereby impacting wilderness solitude and naturalness. Such storage is important because of historic use of wilderness water for irrigation in valleys below, and growing competition in the western United States for water to maintain “in stream” flows for fisheries, aquatic biota, and wildlife. But maintenance and reconstruction of water storage facilities in wilderness are very controversial because of the mechanized intrusions that are required.

Again, the mandate is for wilderness naturalness. Water is an increasingly scarce commodity, the best of which may come from wilderness. How can we do what’s needed and required while minimizing impacts?

13. Advanced technology threatens to reduce wilderness solitude with electronic communication, navigation devices, and mechanical transport equipment that dilute remoteness,

risk, and discovery. Technology also intrudes with high-tech outerwear and backpacking gear that insulate visitors from historic wilderness experiences (Knapp 2000). The use of GPS equipment, cell phones, radios, and other electronic technology by search-and-rescue personnel is generally accepted, much like the use of high-technology ropes and climbing gear. The use of mechanical transport in search-and-rescue operations is also accepted when human life is at stake. But the availability of modern electronic communication, navigation devices, and mechanized access may give visitors a false sense of security and contribute to irresponsible behaviors based on their assumption that rescue is only a cellphone call and helicopter flight away. But why can't users be asked to observe more of a minimum-tool approach to wilderness recreation? We think their wilderness experiences and benefits would be better for it, and we urge wilderness managers to provide leadership in transmitting this message.

14. Motorized and mechanical equipment trespass and legal use can dilute wilderness solitude and damage resources. For example, operators of snowmobiles and all terrain vehicles (ATV's) can travel cross-country and enter a wilderness area inadvertently, or the trespass may be deliberate for convenience or recreational purposes, and go undiscovered in remote locations. Management's use of motorized vehicles and mechanical equipment is legal in wilderness where it is the minimum method for accomplishing a legitimate wilderness purpose, and in some areas for such activities as wildlife management and law enforcement. Examples that might be approved are helicopters for special projects, ATVs for beach patrols, four-wheel-drive vehicles for wildlife management activities, and chain saws for trail construction. When wilderness visitors see managers using mechanized vehicles or equipment, it affects how they view them and shapes visitors' views of what wilderness should be. To the

contrary, when visitors see wilderness managers—and researchers—carrying out their work with primitive tools, it sends a positive message of respect for the wilderness and conveys that living with primitive skills and tools is possible!

15. Aircraft noise from aircraft overflights of wilderness by commercial and military aircraft cause noise and visual pollution, and dilute solitude with a dramatic reminder of modern society to which wilderness users object (Tarrant et al. 1995). There are also legal private and public airfields in wilderness in Montana and Idaho used by private visitors as well as outfitters moving supplies and customers (Meyer 1999). In Alaska the preexisting use of aircraft, especially floatplanes, continues in designated wilderness. Lowlevel military overflights can be traumatic to wilderness visitors and resident fauna, though such privilege is legally sanctioned in many areas. As overflights and the use of aircraft to access wilderness grows, wilderness managers must determine what management discretion is available to limit them or mitigate their impacts, and then face objections from the military, private pilot, and wilderness outfitter organizations that do not want such privileges limited. We hope wilderness managers will exercise their fullest possible discretion and influence to keep overflights and air access into wilderness from escalating, and reducing them when possible.

16. Urbanization and encroaching urban development toward wilderness boundaries dilutes wilderness with civilized sights, sounds,




Public Lands Day Cleanup in the Old Woman Mountains Wilderness (BLM) in the California Desert. Photo by Marilyn Riley.

and diminished remoteness. Urban sprawl has dramatically affected wilderness conditions with smog, encroaching roads that make access easier, noise, and casual day use in urban-proximate wildernesses such as San Geronimo outside Los Angeles. We fear that increasingly diverse and urbanized visitors to wilderness may be satisfied with trips to crowded and heavily impacted wilderness due to their lack of previous experience in more pristine areas and may develop a wilderness frame of reference more tolerant of crowding and oblivious to impacts. Yet these users may need the respite offered by wilderness the most. We urge managers to expand their educational efforts about what wilderness is, what it is meant to provide, why management is necessary—and to do everything possible to see that diverse, urban visitors have the chance to enjoy a wilderness experience. We need the support and understanding of these people to sustain wilderness.

17. Lack of political, and thus financial support for wilderness protection and management is a great concern of the federal agencies, as expressed by then chief of the USFS Mike Dombeck, "...the resources committed to protect and manage wilderness have not kept pace with our needs. ...particularly for field work budgets and staff" (1999). The evidence of such neglect is wide and deep. Long overdue wilderness plans are still in progress or have not been started. Others are in need of revision and updating. Numerous roadless and wilderness study areas are being evaluated to determine if

they should be added to the NWPS, and many areas recommended for wilderness years ago have not been acted upon by Congress. This lack of political and financial support for wilderness stewardship may be one of the most serious threats to wilderness in the long run. Funding for people and programs is required to maintain high standards of wilderness naturalness and solitude. We all need to help meet this threat by speaking out for wilderness to elected officials, and enlisting help from organizations and the larger public to whom elected officials are responsive.

Conclusion

This list of 17 threats to wilderness oversimplifies them, their seriousness, their current escalation, and how they might be addressed. We encourage a stronger stand against them by managers, and proactive support for manager resistance to them by the wilderness community. Reducing the dilution of wilderness resources and values by these threats and impacts is essential to help wilderness achieve its potential. 

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REFERENCES

- Asher, J. E. and D. W. Harmon. 1995. Invasive exotic plants are destroying the naturalness of U.S. wilderness areas. *IJW* 1 (2): 35–37.
- Bell, P. A., W. Malm, R. J. Loomis, and G. E. McGlothlin. 1985. Impact of impaired visibility on visitor enjoyment of the Grand Canyon. *Environment and Behavior* 17 (4): 459–474.
- Cole, David N. 2000. Natural, wild, uncrowded, or free? Which of these should wilderness be? *IJW* 6 (2): 5–8.
- Dombeck, Mike. 1999. A wilderness agenda and legacy for the U. S. Forest Service. *IJW* 5 (3): 4–6.
- Kelson, A. R., and R. J. Lillieholm. 1997. The influence of adjacent land activities on wilderness resources: U.S. wilderness manager perceptions. *IJW* 3 (1): 25–28.
- Knapp, D. 2000. Activities and technology: technology and wilderness in the 21st century. *IJW* 6 (2): 20.
- Landres, Peter B., P. S. White, G. Aplet, and A. Zimmermann. 1998a. Naturalness and natural variability: definitions, concepts, and strategies for wilderness management. In D. L. Kulhavy, and M. H. Legg eds. *Wilderness and Natural Areas in Eastern United States: Research, Management and Planning*. Nacogdoches, Tex.: Stephen F. Austin State University, Arthur Temple College of Forestry, Center for Applied Studies. pp. 41–50
- Landres, Peter B., S. Marsh, L. Merigliano, D. Ritter, and A. Norman. 1998b. Boundary effects on wilderness and other natural areas. In R. L. Knight, and P. B. Landres. *Stewardship across Boundaries*. Covelo, Calif.: Island Press, pp. 117–139.
- Landres, Peter B. and S. Meyer. 2000. National wilderness preservation system database: key attributes and trends, 1964 through 1999. Gen. Tech. Rep. RMRS-GTR-18, rev. ed. Ogden, Utah: USDA Forest Service, Rocky Mountain Research Station.
- Meyer, S. S. 1999. The role of legislative history in agency decision-making: a case study of wilderness airstrip management in the United States. *IJW* 5 (2): 9–12.
- Murray, M. P. 1997. High elevation meadows and grazing: common past effects and future improvements. *IJW* 3 (4): 24–28.
- Stokes, J. 1999. Wilderness management priorities in a changing political environment. *IJW* 5 (1): 4–8.
- Tarrant, M. A., G. E. Haas, and M. J. Manfredo. 1995. Factors affecting visitor evaluations of aircraft overflights of wilderness areas. *Society and Natural Resources* 8: 351–360.
- U.S. Public Law. 103-433. 1994. California Desert Protection Act of 1994.

Ian Player: *Madolo*

BY VANCE MARTIN

He has walked more miles in the deep wilderness than most people walk in three lifetimes, each step painful due to a deformed knee from a boyhood accident. This defining physical characteristic earned Ian Player the name *Madolo* (ma-door-lo), “the knee,” from the Zulu people with whom he worked and lived in the Zululand wilderness-like game reserves of Natal Province, South Africa. Player claims, “This time in wilderness changed my life,” and through his efforts the wilderness experience would change the lives of many more, and wilderness would become a reality in South Africa.

Player began his conservation career in 1952 as a relief game ranger on the shores of Lake St. Lucia, patrolling for poachers in one of Africa’s largest, most beautiful, and biologically diverse estuaries. He rose rapidly through the ranks of the provincial conservation service, ultimately to become chief conservator of all game reserves in Zululand. In the process he was credited for leadership in saving the white rhino from extinction (he insists that he led “a superb team”

and declaring the first wilderness area in Africa in the Umfolozi Game Reserve in 1958.

Responding to a higher vision in 1974 at age 47, and forgoing all pension benefits, Ian Player left the conservation service to focus on wilderness. Player recalls, “Everyone thought I had lost my marbles.” But his experiences walking among lion and rhino, canoeing wild rivers, and sleeping countless nights in the African bush had “saved” his life. He believed that the experience of wilderness that had changed his life for the better could change the lives of other people, and even change the world. Without the security of a guaranteed paycheck or budget, he started the Wilderness Leadership School (WLS), a new, nonprofit organization to give leaders and young people a wilderness experience. To finance this venture he traveled South Africa and the world, lecturing, writing, fundraising, and speaking for wilderness, and leaving at home a supportive wife and three school-aged children.

Defying the odds in apartheid-era South Africa, he pioneered multiracial outdoor experiential education. To date, the WLS has taken more than 35,000 people in small groups into the African wilderness on foot treks, or “trails.” Player and Magqubu Ntombela, his (now deceased) Zulu friend and mentor, personally led many of these groups. The diaries penned by the participants of all races—corporate executives, school children, housewives—all contain a single phrase more than any other, “This experience changed my life.”

Player went on to create an international wilderness movement. Working with associates in other countries he founded the Wilderness Trust in the United Kingdom and The WILD Foundation based in the United States. Working with WILD he established the World Wilderness Congress to create greater global awareness and action through periodic gatherings in different countries. More recently he led the Wilderness Foundation in South Africa in wilderness



Ian Player with Magqubu Ntombela. Photo by Jane Campbell.

advocacy and action, playing a pivotal role in saving Lake St. Lucia from proposed dune mining and then in its declaration as South Africa's first World Heritage Area. In recognition of his growing and visible wilderness achievements and scholarship, he received an honorary doctorate from the University of Natal in 1990. He has handed over the director's position of the Wilderness Foundation, South Africa, to Andrew Muir.

Practical game ranger, scholar, self-trained ecologist, author, philosopher, international diplomat, husband-father-grandfather, and possessed of one of the largest personal libraries in South Africa on Carl Jung's psychology, he is still respectfully greeted in Zululand as *Madolo*. Knee surgery two years ago allows him to walk without pain for the first time in more than 55 years, but the name remains. Although old injuries from wilderness fieldwork and game capture are returning to haunt him at age 74, he is still waging the battle for wilderness with his pen, strong voice, and commanding presence. His experience and knowledge

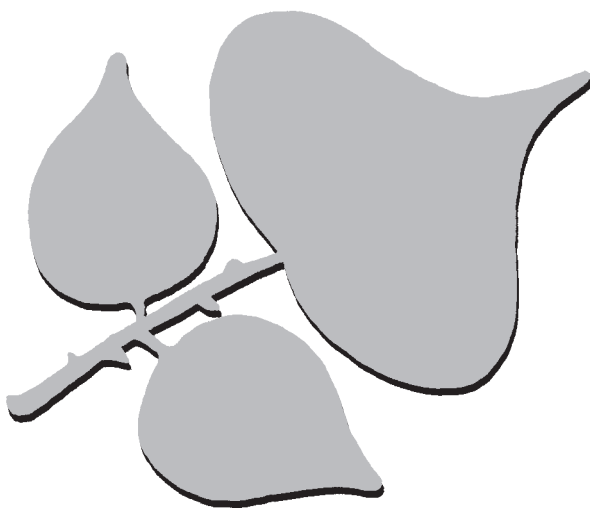


Ian Player and his wife of 40 years, Ann Player. Photo by Marilyn Riley.

are profound, and his goal is clear: save wilderness and thus, save the human spirit. 🌀

Some of Ian Player's notable adventures, achievements, and ideas are described in his

books: *Men, Rivers and Canoes* (out of print) 1964; *The White Rhino Saga*, (out of print), 1972; *South African Passage* (Fulcrum Publishing), 1987; *Zulu Wilderness: Shadow and Soul* (Fulcrum Publishing), 1998. For more information, contact Fulcrum Publishing at www.fulcrum-books.com.



This leaf is the *erythrina caffra*, or naked coral tree, and is the international logo for a family of distinct but collaborating wilderness organizations founded by Ian Player. At Ian's request to suggest a symbol, Magqubu Ntombela selected this particular leaf because in Zulu culture the tree is found both in settlements and in the wild. The tips of the three leaflets represent an individual's relationship to the land, to other humans, and to God.

Sustainable Financing of Wilderness Protection

An Experiment with Fees in the United States

BY ALAN E. WATSON

Abstract: While wilderness protection has traditionally occurred from tax support, there are other options. In the United States, currently there is an experiment to charge fees for recreation access, including wilderness. Questions remain about whether the public supports wilderness recreation fees, how fees might change relationships between people and wilderness, whether a buyer-seller relationship between federal land management agencies and wilderness visitors is desirable, how wilderness fees may differ from recreation fees, and who will be affected most by wilderness use fees.

Introduction

Wilderness protection has typically been financed through taxes. However, budgets fluctuate, making consistent management difficult. The tasks of monitoring, public education, and restoration of impacted sites and ecosystems is becoming increasingly difficult to accomplish within current budget allocations. There are some good aspects of financing wilderness protection through taxation, however. Federal legislation and federal taxes to protect wilderness in the United States acknowledge the many values of wilderness realized by society as a whole. Nonusers and future generations can be acknowledged as beneficiaries of this protection, and we collectively provide these benefits.

There are alternatives to financing wilderness protection through taxes. Although The Wilderness Act (TWA) made it clear that the secretaries of agriculture and interior were authorized to accept contributions and gifts in order to meet the objectives of the wilderness system, donations to provide wilderness protection services are relatively untried (Martin 2000). Barnes (1998) discussed the need for taxing nonuse values in Namibia as a way to transfer benefits from the international community to local villages. Excise taxes and licenses have been used in fishing and hunting programs in the United States extensively, and national and international organizations,



Article author Alan Watson (far right) and his family in Pyhätunturi (the Holy Field) National Park, Finland. Photo courtesy of the Aldo Leopold Institute.

such as the Nature Conservancy, the Global Environmental Facility, and the World Bank, have been crucial to protection of many threatened places in the world. Local commitment

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through “Friends” groups has also provided funding to continue important wilderness management work in many places. While these are all potential new solutions to sustainable financing problems, the approach currently receiving the greatest attention in the United States is user fees.

Recreation User Fees

The U.S. Congress authorized the National Park Service, the Fish and Wildlife Service, the Bureau of Land Management, and the Forest Service to implement the Recreational Fee Demonstration Program (RFDP) in 1996. The RFDP gave these agencies freedom, even a mandate, to test a variety of new recreation use fees, including general use fees and access and use fees for specific sites, facilities, and programs. The legislation allows at least 80% of revenues to be kept locally for on-site facility and program improvements. Originally the test was only to last for three years, but it was extended for two additional years with subsequent legislation, and then again for one more year in 2000.

The purpose of this article is to reflect on knowledge developed from recent research on recreation fees (Watson and Herath 1999), with a focus on issues associated with charging fees to enter wilderness.

Important Wilderness Fee Issues

There is no intent stated in TWA (Public Law 88-577) to always provide free access to wilderness, nor are user fees addressed. The only mention of financing within TWA is that no appropriation from Congress will ever be given for expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit, nor for any additional personnel to manage these areas. Thus, wilderness

must be financed as an effort within the larger agency of which it is part. With a growing system of wilderness, and insufficient funds within the land management agencies to finance all needs, user fees have surfaced for consideration as an approach to at least supplement Congressional funding. But, charging for admission to wilderness through user fees raises some new questions not previously addressed in U.S. literature.

Does the Public Support Wilderness Recreation Fees?

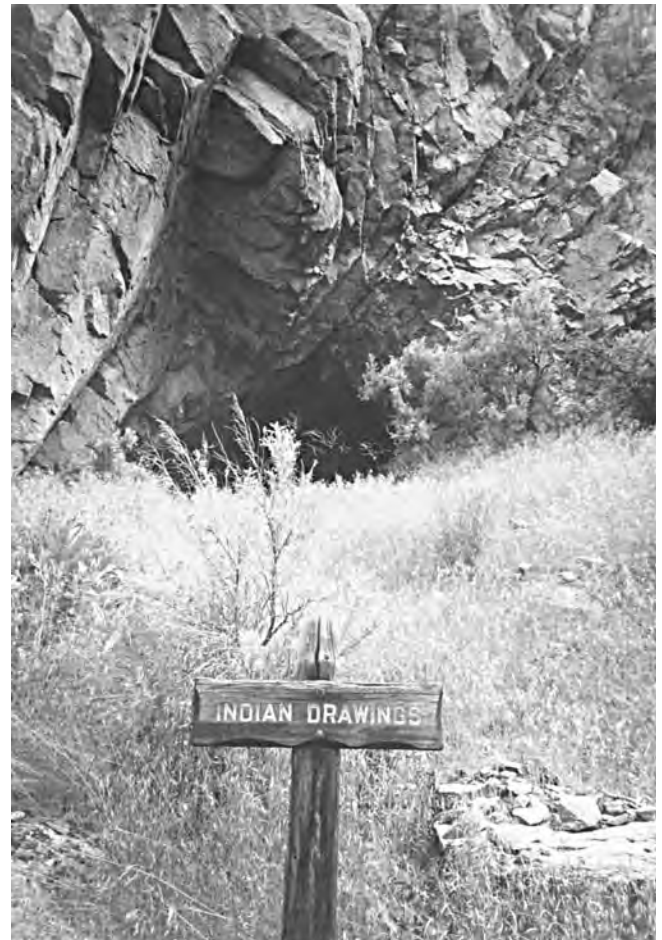
We have heard federal officials claim, and critical voices admit, that the majority of the American public generally support recreation fees on public lands. Some recent studies support that generality. Most of the recent research, however, has depended only upon responses from current visitors who have paid the fees.

In their study of different communities of interest in southern California, Winter et al. (1999) found a vast majority disapproved of fees, and an additional minority expressed only conditional acceptance. Bowker et al. (1999) also found support for providing recreation services from taxes outweighed support for using only fees or a combination of fees and taxes on 6 of 10 types of fees proposed. The user fee approach has been controversial, and it has not yet been resolved if it will become publicly acceptable or not. We have not adequately assessed the opinions of those who have

decided not to pay a fee, or the general public who may or may not visit the area, but are members of the collective community that has established public lands.

How Might User Fees Change the Relationship Between People and Wilderness?

One of the major complaints heard about the fee program is that it commercializes national treasures of public lands. On the other hand, today in the United States there is a substantial call for government to operate more like the private sector through applying more cost-efficient business and marketing principles. There may be many lessons to be learned from the private sector,



Indian drawings in the Frank Church River of No Return Wilderness. Visitor support for use of fees suggests public concern about overdevelopment of wilderness. Photo by Alan Watson.

Exchanging currency for services may be one of the primary differences between places where human influence dominates and those places which are primeval, untrammelled, and where self-reliance and independence are highly valued.

but many questions arise about adopting marketing and business economics to improve efficiency in providing wilderness opportunities. We must ask ourselves if the creators of wilderness in the United States intended for us to manage it for individual utility maximization, as economic theory describes, or as a societal good. Further, many public land managing agencies are working to focus on and increase “customer satisfaction” among visitors; how will user fees affect satisfaction among wilderness customers?

There have been three approaches used in establishing fee levels at recreation demonstration sites in the United States. First, typically the objective is generating maximum revenue (Martin 1999), so information about how many trips would be taken annually at various price levels yields a demand curve that suggests an optimum price. Second, some managers have set prices at a level comparable to those in the private sector for similar services or experiences. This works for campgrounds, but substitutes for wilderness are not available in the United States. Third, fee levels could be based on the cost of providing services. But, costs for providing wilderness experiences are difficult to track, especially within large bureaucratic organizations, and the on-site services for visitors are often a small part of the costs and benefits of wilderness protection.

Consideration of wilderness from a collective perspective suggests the need

to be more concerned with the ability to protect these places as havens where advancing civilization is not welcome. Exchanging currency for services may be one of the primary differences between places where human influence dominates and those places that are primeval, untrammelled, and where self-reliance and independence are highly valued. We cannot accurately predict how fees for entry might change a wilderness experience and subsequent beneficial effects.

Is the Relationship between Buyer and Seller of Wilderness Experiences Desirable?

We know from research by Schneider and Budruk (1999) that displacement occurs among some public land visitors due to new fees. But few reasonable substitutes are available for those who might be displaced from wilderness because of user fees. Are we as free as the private sector may be to disregard displacement effects of wilderness user fees?

Trainor and Norgaard (1999) found high incompatibility between economic values and the values placed on wilderness. They found that people had great difficulty placing a monetary value on wilderness experiences. We have specifically avoided this incompatibility as a society by establishing public land as common property in the

first place, and then designating a portion of those lands as symbolically free from the pressures of resource extraction and modern civilization.

Vogt and Williams (1999), found that wilderness visitors tended to support the use of fees to maintain current conditions, at least as much if not more than improving them, suggesting a concern by some about fees leading to overdevelopment of wilderness. There has often been an assurance by public land managers that fees will indeed lead to improved services. This is a common justification for charging fees, much as would be used in a private market situation. For these agencies the easiest way to show results from the fees are by painting, cleaning, or repairing bathrooms, upgrading parking lots, or replacing old signs. But in recent research, the services wilderness visitors want supported by fees are not so easily visible or so materials-oriented. Desolation Wilderness visitors wanted fees spent on restoration of human-damaged sites, litter removal, and information about ways to reduce impacts (Vogt and Williams 1999). Thus, if wilderness user fees are to be used to supplement insufficient wilderness budgets, assurance is needed that the public purpose of the place will not be violated (e.g., developing services and facilities in wilderness).

How Are Wilderness Fees and Recreation Fees Different?

There has been the assumption that the public is more supportive of fees at areas where facilities are provided. Bowker et al. (1999) found that the public supports use of fees to provide boat ramps, campgrounds, special exhibits, and parking areas, but some other facilities were among the least supported. Vogt and Williams (1999) found strongest support among wilderness visitors to be

for several nonfacility-related expenditures. It appears that the public is supportive of fees to accomplish the more general intended public purpose of an area; sometimes the public purpose requires facilities and sometimes it does not. Providing wilderness experience opportunities is not dependent upon facilities. Rather it is dependent upon confidence that the agency is maintaining the wilderness qualities of naturalness and solitude—the wildness—of designated areas. Wilderness user fees must contribute to these purposes, not improved rest rooms, signs, and parking lots.

Who Will Be Affected Most by Wilderness User Fees?

There is naturally concern that low-income people will be most impacted by access fees. Unfortunately, however, there are much greater financial obstacles to participation by the impoverished than relatively small user fees. More (1999) challenges us to expand our concern beyond the poor to those on the income margins. Stratifying the public to more closely examine the effects of user fees on middle-income, working-class, working-poor, and impoverished people will likely reveal more than separating the American people into “low income” and everyone else. Very low-income visitors are underrepresented among wilderness visitors, and user fees would obviously further reduce their access, but there may be potential income effects on visitors in other income groups as well.

It is unclear whether those most committed to wilderness or involved in wilderness activities would be most supportive of fees. But, those living in closest proximity and most involved have been found less likely to have positive response to wilderness fees (Puttkammer and Watson 1998;

Williams et al. 1999). We need to further understand who is affected by fees in order to understand the costs associated with this potentially sustainable source of wilderness funding.

Conclusion

How the public responds to wilderness management actions is not just a function of how well they perceive that action to be in protecting the wilderness. Public response is partly a function of how the public perceives the agency has done in other stewardship responsibilities. Public trust (Winter et al. 1999) cannot be developed through concentration on a single management issue any more than ecosystems can become sustainable by focus on a single element of the environment.

Around the world we are struggling to retain some wildness in our landscapes through legislation, responsible stewardship, and education of visitors and the public about wilderness values. But the success of these efforts depends on funding the continuing needs for management, restoration, monitoring, scientific investigation, and visitor services. So far, general tax revenues appropriated to land management agencies have been the source of funding for wilderness management in the United States. If wilderness recreation fees are to be a long-term source of funding wilderness protection in the United States, we need to implement them in a way that respects the relationship between wilderness and the American people.

Not all countries have established a tradition of public funding of wilderness protection. To understand the land use history of the United States necessarily involves understanding the reasons for mass immigration to avoid restrictions on land in other countries, imposed by more privileged classes. It

may be that as a society we face some choices. Do we want fee support to enable accomplishment of most of the objectives of wilderness protection but with associated displacement and commercialization effects? Or do we continue a campaign to increase and stabilize fluctuating public support of wilderness programs in order to fulfill the original intent of wilderness places? Decisions about whether to charge federal land recreation fees will be made in the political arena. Exactly where to charge fees and how much to charge may be a political decision or left to individual managers. Hopefully, there will be due consideration of the findings from recent research in establishing our public land fee policies, no matter where the policies originate. ♻️

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People living in close proximity to wilderness are less likely to respond positively to fees.

REFERENCES

- Barnes, J. I. 1998. Economic value of wilderness in Namibia. *IJW* 4 (1):33–38.
- Bowker, J. M., H. K. Cordell, and C. Y. Johnson. 1999. User fees for recreation services on public lands: a national assessment. *Journal of Park and Recreation Administration* 17 (3):1–14.
- Martin, S. R. 1999. A policy implementation analysis of the recreation fee demonstration program: convergence of public sentiment, agency programs, and policy principles? *Journal of Park and Recreation Administration* 17 (3):15–34.
- Martin, S. R. 2000. Donations as an alternative to wilderness user fees—the case of the Desolation Wilderness. In D. N. Cole, S. F. McCool, W. T. Borrie, and J. O'Loughlin, comps. *Wilderness science in a time of change conference—Volume 4: wilderness visitors, experiences, and visitor management—May 23–27, 1999, Missoula, Mont. Proceedings RMRS-P-15-VOL-4*. Ogden, Utah: USDA, Forest Service, Rocky Mountain Research Station.
- More, T. A. 1999. A functionalist approach to user fees. *Journal of Leisure Research* 31 (3): 227–244.
- Puttkammer, A., and A. E. Watson. 1998. Acceptability of fees for various recreation activities as a function of activity orientation and past fee behavior. In A. Watson and A. Puttkammer comps., *Societal response to recreation fees on public lands: a synopsis of papers presented at the Seventh International Symposium on Society and Resource Management: Culture, Environment, and Society*. May 27–31, 1998, University of Missouri–Columbia. www.fs.fed.us/research/rvur/wilderness/recreation_fees.htm.
- Schneider, I. E., and M. Budruk. 1999. Displacement as a response to the federal recreation fee program. *Journal of Park and Recreation Administration*, 17 (3): 76–84.
- Trainor, S. F., and R. B. Norgaard. 1999. Recreation fees in the context of wilderness values. *Journal of Park and Recreation Administration* 17 (3): 100–115.
- Vogt, C. A., and D. R. Williams. 1999. Support for wilderness recreation fees: the influence of fee purpose and day versus overnight use. *Journal of Park and Recreation Administration* 17 (3): 85–99.
- Watson, A. E., and G. Herath. 1999. Research implications of the theme issues "Recreation Fees and Pricing Issues in the Public Sector" (*Journal of Park and Recreation Administration*) and "Societal Response to Recreation Fees on Public Lands" (*Journal of Leisure Research*). *Journal of Leisure Research* 31 (3): 325–334.
- Williams, D. R., C. A. Vogt, and J. Vitterso. 1999. Structural equation modelling of users' response to wilderness recreation fees. *Journal of Leisure Research* 31 (3): 245–268.
- Winter, P. L, L. J. Palucki, and R. L. Burkhardt. 1999. Anticipated responses to a fee program: the key is trust. *Journal of Leisure Research* 31 (3): 207–226.

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the National Parks and Wildlife Service) and Japan International Cooperation Agency, this plan has declared a wilderness zone for the first time in the history of Zambian protected areas. The consultative process included extensive interchange with local communities and NGOs. More than 61% (13,500 sq. km.) of the 22,400-square-kilometer (8,650 sq. acre) park now includes de facto wilderness management: six Special Conservation Zones (no human disturbance, protection and research only), or 2% of the park; and 10 Wilderness Zones (access by foot, horseback, and canoe), or 59% of the park.

This is a significant step in the evolution of wilderness internationally. Zambia has no national legal instrument governing designation and management of wilderness areas. However, this major commitment to zonation and management for wilderness values sends a strong signal that local communities and national resource agencies in developing countries understand and commit to the protection and sustainability of wilderness values.

Commitment to the plan exists right to the top of the ZWA, and also among the local communities adjacent to the park that hope to gain from wilderness tourism. The task before the ZWA is to now find the resources to train staff and implement the plan. The next step in the training process will occur at the 7th World Wilderness Congress, in which several ZWA staff will participate as part of the congress scholarship program.

Great Bear Victory

After 10 years of activism by a consortium of Canadian and international nongovernmental organizations, the Canadian government and timber industry officials have agreed to protect 3.5 million acres of the British Columbia's coastal rain forest from logging. Called "The Great Bear" by activists, this temperate rain forest contains far-reaching stands of 1,000-year-old spruce trees. Construction giant Home Depot adopted a policy of phased-out purchases of old growth timber. At nearly twice the size of

Yellowstone National Park, the area supports the rare white-collared black bear. Environmentalists are hopeful that this agreement will serve as a model for protection of other remaining old-growth forests.

Kakadu Mining Decision to Be Reviewed

The Australian Wilderness Society and other key environmental groups hailed an announcement by the Rio Tinto Zinc (RTZ) mining company that cast doubt over renewed uranium mining at Jabiluka inside the famous Kakadu National Park, Northern Territory. Against a backdrop of record-low uranium prices and public and indigenous opposition, RTZ said that Jabiluka's production prospects "were not good." The Wilderness Society corporate campaigner, Leanne Minshull, affirmed that environmental groups welcome the change in the company's position and will encourage them to end the project once and for all.

Why Opposition to Fee Demo Is Growing

BY DAVID BROWN

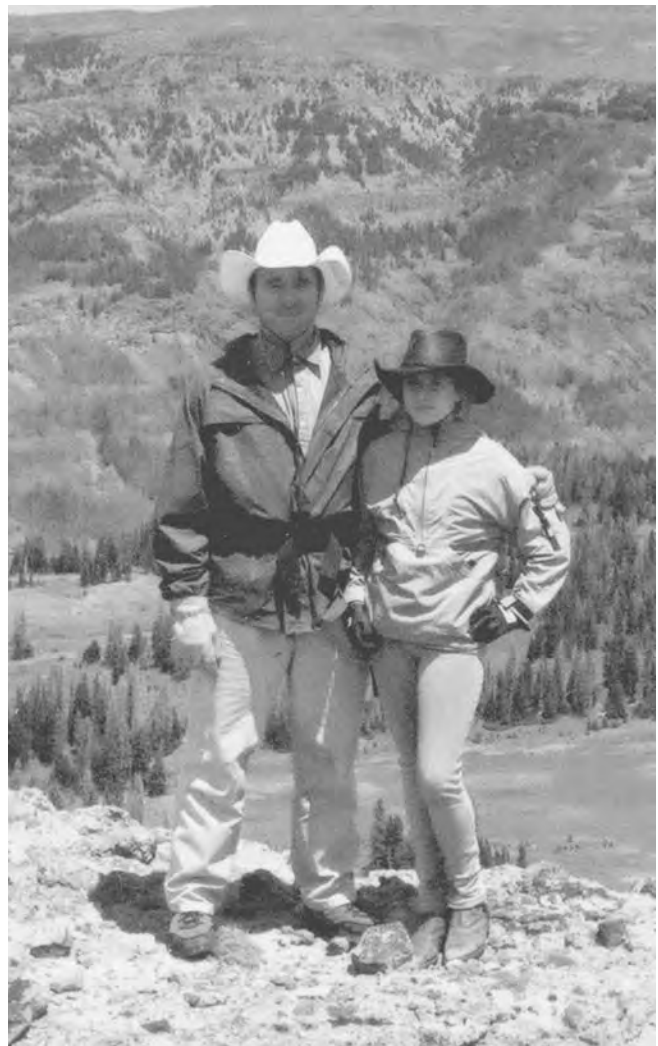
America Outdoors's position on the Recreational Fee Demonstration Program for federal agencies is best described as "evolving." We are reevaluating our position as members gain more experience with the program and as opposition to it builds. Outfitters, who make up the membership of America Outdoors, have long paid fees for the privilege of operating on federal lands, and we expect to continue to pay fees. In general, we support the concept of returning fees to the resource or agency that collects them. But there are a number of problems with the implementation of Fee Demo among all the agencies that should be corrected before the program is extended or reauthorized, not the least of which is the layering of several different fees on the outfitted public.

Currently outfitters are facing three separate fee initiatives in the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS).

- Franchise or use fees related to special use permits.
- Fee Demo fees
- Cost recovery for permit administration, including applications, National Environmental Policy Act (NEPA) analysis, and performance evaluations

Most of these fees are levied without regard for the level of fee overhead that the market can bear. The viability of outfitted trips was clearly threatened by some of these initiatives that are currently under review. So, it is against that backdrop that the Fee Demo program is viewed by informed outfitters. Fee Demo is supported in areas where the agencies have worked with its customers, taken input, and modified plans to fit the market. A command and control mentality will not work in this market environment. Outfitters simply cannot pass on all these costs to the consumer in an era with so much competition for the leisure dollar.

The shortfall in the recreation budget for the USFS and BLM is real and has to be dealt with. The recreation budget



Article author David Brown with his daughter, Hillary, in Wyoming. Photo courtesy of Robin Brown.

has not kept pace with inflation, higher overhead, or with increased recreational use of public lands. These budget problems have been aggravated by shifts in budget priorities. The Clinton administration, for example, consistently proposed more money for land acquisition without increasing funding

for recreation management. Under this scenario, at a time when balancing the budget became a priority, it was natural for agencies to look to users to take up the slack.

But many recreationists and outfitters also realize that congressional interest in user fees to pay for federal benefits has been selective. Private pilots pay no fees to the Federal Aviation Administration for management of air space. Pleasure boats generally do not pay fees to navigate through locks and dams. In national forests and on BLM lands, agencies have often turned a blind eye to illegal outfitting or provided free access to some groups whose use is clearly commercial. For example, BLM provided letters of authorization to nonprofit groups to operate without paying fees in some areas in Oregon. Congress completely exempted most nonprofit activities from regulations and fees in national parks. Why should outfitters pay more when their competition is getting a free ride?

Opposition to Fee Demo is growing in the recreation community because some users also feel the agencies are transferring the costs for inefficient processes to the public and increasing fees for access to areas that many believe are theirs to use at no charge due to the taxes they already pay. Users see themselves paying more with no tangible increase in benefits. The goals of the program shift constantly depending on whom you talk to within the agency. Opposition will grow even more when the fee authority is expanded beyond 100 sites, unless changes are made.

In a parting shot, distributed widely by e-mail, a retiring USFS budget officer described it this way: "We have spent an ungodly amount of the public's treasury producing Forest Plans that provide the public nothing in return but fewer and fewer goods

and services. We are now being asked to spend even more to increase the weight of these Forest Plan documents to protect every fly, plant, critter that crawls or walks on minimum of four legs, etc. But absolutely nothing for the two-legged public who we expect to be underwriting this farce."

This retiree's comment is especially pertinent to wilderness management. Outfitters are finding that wilderness management strategies in some areas are becoming so restrictive that operations are not economically viable. Agencies certainly cannot expect to garner fee revenue from outfitters when their operations are marginal or nonexistent.


Some suggestions to gain outfitters' support for a similar fee initiative include the following actions:

- Consolidate fees for outfitters to allow for the existing permit fee and Fee Demo fees to be used to cover the cost of permit administration. We realize that a consolidated fee would be more than the access fee paid by self-guided users. However, Fee Demo fees should not be levied on the outfitted public unless all users are paying it.
- Agencies should not exempt nonprofit operations from fee payments. The largest commercial operations on public lands are nonprofits, and responsible nonprofits support fee payments. Ironically, the National Park Service, in one of the most irresponsible positions ever taken by a land-managing agency, recently testified in support of the exemption from most regulations for nonprofit trips in the backcountry.
- NEPA costs are part of the broad programmatic responsibilities of the agencies. Permittees that are not proposing significant changes

in operations and that do not deviate from approved management plans should not be required to pay those costs.

- Agencies should show more interest in stopping illegal operations. How can legitimate outfitter operations be expected to cooperate in fee programs when the agencies turn a blind eye to illegal and unpermitted operations?

Users are rebelling, but against the symptom (Fee Demo) and not against the more significant problem: the lack of consensus and political will to deal with these funding and agency "process" problems. Federal agencies' funding initiatives consist of a series of opportunistic, piecemeal strategies, instead of long-term plans that project costs and balance those costs with projected revenues from a variety of sources. As a former federal employee, I also know that the agencies' emphasis is on increasing the annual operating budget with far less concern for controlling costs. Achieving greater efficiencies needs to be considered along with funding sources.

One of the consequences of Fee Demo is a healthy consumer interest in agency management and spending. By rejecting the inappropriate use of the congressional appropriations process to authorize fee demo, perhaps users can encourage Congress to deal with this program through the authorizing committees in a way that provides more clarity and consensus. Then we'll have clear rules that specify the types of activities that are appropriate for fees and provide clear parameters on use of the money. 

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Recreation Fees at Federal Sites

BY DERRICK CRANDALL

Fees for use of public recreation facilities and services are not new. Fees were established early in the history of the national park system and today generate more than \$100 million annually in federal receipts, collected chiefly by the National Park Service and the Forest Service through entrance fees, camping fees, ski area permit fees, and assorted other recreation fees collected from recreationists and those providing recreation services on public lands.


Much of the philosophical and legal basis for recreation fees is outlined in the 1964 Land and Water Conservation Fund Act. The act was the product of those who recognized the importance of recreation in America, and it has enriched our lives immeasurably through strategic increases to federal and state land systems. Yet a great deal has changed since the time of this act, and, despite periodic amendments, the criteria and specific provisions for fees deserve careful review and a new clear and comprehensive strategy.

The framework for a new recreation fee strategy is outlined in the 1987 report of the President's Commission on Americans Outdoors. It argued that public recreation program spending needed to rise and that primary responsibility for the increases should fall upon those who are the direct beneficiaries of these programs. The report noted that recreation expenditures by Americans exceed \$300 billion annually and represent a steadily increasing share of consumer discretionary spending. But the report also argued for accountability between fees and services provided.

The American Recreation Coalition (ARC) supports federal recreation fees if the fees meet the following principles:

- **The fees are equitable**, and aimed at recovering costs where the services and facilities provided represent significant costs to American taxpayers.
- **The fee system is efficient**, costing the least amount practical to administer.

- **The fees are convenient for the recreationist**, so that voluntary compliance is readily achievable.
- **The fee system is coherent and integrated**, so that overlapping charges are minimized, and federal, state and local fees are integrated where appropriate.
- **The fee revenues are returned to benefit resources, facilities, and programs utilized by those paying the fees.**

ARC believes that new and higher recreation fees must have a demonstrable positive impact on resource protection and visitor services. While it is true that recreationists today do not pay fees equivalent to the entire cost of managing recreation on federal lands, fee increases that are designed solely to replace general fund appropriations will be unpopular and difficult to implement. Moreover, recreational activities are a non-consumptive use of the American legacy of the outdoors, in contrast to certain other public land uses—which also often fail to pay fully for the costs to the taxpayer. 

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A fee payment station at the entrance to wilderness. Photo by Chad Dawson.

Opposition to the Recreation Fee Demonstration Program

Editor's Note: The Recreational Fee Demonstration Program, passed in 1996, has been opposed by individuals and recreation organizations and has even encouraged the formation of new organizations. Here is what some of these organizations say about themselves and their concerns.

The Public Access Coalition's members "are strong supporters of America's land management agencies. The Forest Service, National Park Service, Bureau of Land Management, and Fish and Wildlife Service provide America with a unique range of recreational experiences. These agencies also perform a Herculean task in managing these lands with minimal funding, staffing, and resources. It is critical for outdoor users, the agencies, and Congress to develop a funding program for the agencies that is fair and effective, while ensuring the continued protection of the resource and facilities maintenance. Our members would prefer to see Fee Demo terminated; however, we also recognize the importance of working to ensure that the existing system is as fair, efficient, and productive as possible. As a result, we have taken a frank look at Fee Demo and commented on its successes as well as its faults."

Website: www.nofees.org

Wild Wilderness "believes that America's public recreation lands are a national treasure that must be financially supported by the American people and held in public ownership as a legacy for future generations. For the past 100 years, our nation's public lands have been managed so as to maximize the commodity value that could be extracted from them. Today, a major shift in federal land management policy is being developed and implemented. Instead of extracting commodities from nature, nature itself is being converted into a commodity to be repackaged, marketed and sold in the form of value-added recreation products. ... Congressional budget cuts are creating a deliberate maintenance crisis for federally managed recreation lands and facilities. The rescue of a decaying public system, by private investors

and corporate sponsors, is the intended outcome. ... We would support an honest, equitably applied trail fee system."

Website: www.wildwilderness.org

American Whitewater is a nonprofit organization that "was one of many national recreation organizations that initially supported Fee Demo and even testified on its behalf before Congress. Our support was based on the civic ideal that as recreationists we would like to help with the improvement and maintenance of the environment and visitor experience on our public lands. However, we have withdrawn our support for Fee Demo based on the uncorrected deficiencies of this project and the fact that the widespread collection of fees has substantially detracted from our member's enjoyment of visiting America's public lands. In our experience, the implementation has frequently been unfair, arbitrary, unpopular, and inconsistently applied across resource areas."

Website: www.nofees.org

Free Our Parks and Forests is a not-for-profit, all volunteer organization founded to advocate for free and equal noncommercial access to publicly owned lands. "We believe that access to our national lands is a right which may not be restricted on the basis of income. We are opposed to charging a fee to access National Parks, National Forests, National Wildlife Refuges, and other such publicly owned lands, or to use services therein. We believe public lands funding ought to be a Congressional priority, supported through the general tax base."

Website: www.freeourparks.org

Hydrologic Connectivity

A Call for Greater Emphasis in the World's Wilderness

BY CATHERINE M. PRINGLE

Hydrologic connectivity refers to the movement of matter, energy, and/or organisms within water and between elements of the hydrologic cycle (Pringle 2001 a, b). Humans have altered this property on local, regional, and global scales. Because of the continual transport that characterizes hydrologic systems, an effect originating in any part of the landscape may be evident at a distant geographic location, sometimes within protected places such as wilderness. Therefore, dams, water diversions, groundwater extraction, and nutrient and toxic loading outside of wilderness pose significant threats that are difficult to forecast.

The subject of hydrologic connectivity has typically been ignored in theoretical and practical pursuits of wilderness protection. When allocation decisions and management traditions were established for most wilderness in the United States, the science of hydrologic connectivity was in its infancy. Also, many alterations of hydrologic connectivity are beyond the direct control of managers because they are outside wilderness boundaries, and there is commonly a lack of data on hydrologic connections between wilderness resources and surrounding areas. The role of water, both aboveground and below the surface, must become a more integral consideration of wilderness integrity.

Waterways in wilderness can be defined as having interactive pathways along three spatial dimensions: longitudinal (headwater-estuarine), lateral (riverine-riparian/floodplain), and vertical (riverine-groundwater) (Ward and Stanford 1989). Only when all of these dimensions are adequately considered, along with climatic factors, are we really talking about hydrologic connectivity at landscape levels (Pringle 2001 b). Hydrologic connectivity has not been part of the traditional scientific literature surrounding the management and conservation of wilderness landscapes. Only during the last decade have we accepted the premise generally that groundwater and surface waters are interconnected as a single resource (e.g.,



Article author Catherine M. Pringle with her 14-month-old daughter, Pamela-Julissa, tubing the Chattahoochee River in northern Georgia. Photo courtesy of Catherine Pringle.

Winter et al. 1998). We still lack data on how the hydrology of wilderness areas and wild rivers fit into the greater landscape. There is little information in the U.S. about the contribution of wilderness or wild river classification to the protection of water quality, either within wilderness or for off-site benefits. Basic information on river discharge is often not available. There is a need to consider the size, shape, and configuration of wilderness areas with respect to watersheds, regional aquifers, and precipitation patterns in making allocation decisions and understanding the effects of natural or human-caused disturbance (Pringle 2001 b).

How Is Wilderness Affected by Hydrologic Connectivity?

Four global patterns have emerged in human-dominated landscapes that have important implications for the location and

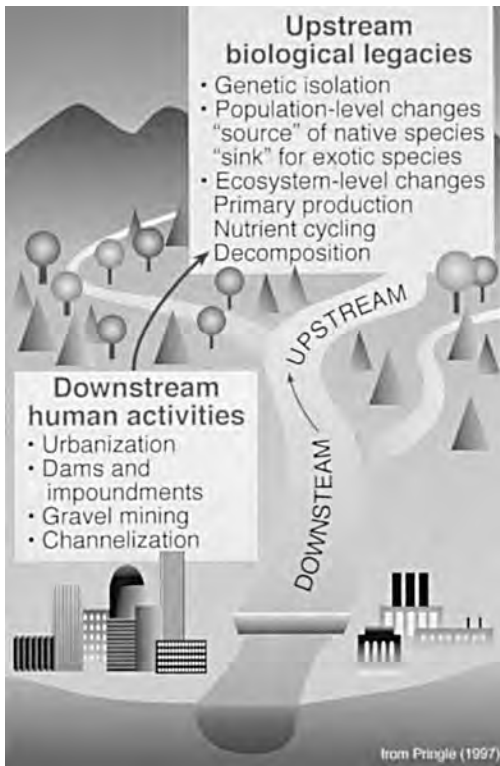


Figure 1—Potential downstream influences on upstream communities. Figure from Pringle (1997).

management of wilderness: (1) the extensive and rapid deterioration of lower watersheds, deltas, estuaries, and receiving coastal waters; (2) the deterioration and loss of riverine flood-

plains, connecting wetlands, and riparian ecosystems; (3) the deterioration of irrigated lands and connecting surface waters; and (4) the isolation of upper watersheds. The isolation of upper watersheds, many of which are protected within wilderness boundaries, merits close attention by the wilderness community.

Trends in human settlement and socioeconomic development have played a major role in determining where wilderness has been protected within watersheds. Human populations have exhibited a general pattern of settling in lowland coastal areas and fertile river valleys and then moving inland and upland. Consequently, many wilderness areas are located in upper watershed areas of highlands rock and ice.

Oftentimes governments set aside land as wilderness because of a combination of low potential for agricultural production, high scenic value, and/or protection for human water supplies—with ecological and wildlife values as a secondary benefit. Many

of these areas now contain some of the last vestiges of intact habitat, wildlife, and other natural features in human-dominated landscapes across the globe, yet they are vulnerable because they have become progressively more and more isolated from their lower watersheds (Pringle 1997).

Effects of isolation of upper watersheds on the biological integrity of wilderness are not well understood. We do know, however, that modifications of lower watersheds such as water abstraction, channel modification, land use changes, nutrient discharge, and toxic discharge can set off a cascade of events upstream that are often not immediately associated with these original downstream sources of disturbance (Pringle 1997). Human disturbances in lower watersheds can alter streams and rivers in their upstream reaches on levels from genes to ecosystems (see Figure 1): (1) genetic and species-level changes, such as reduced genetic flow and variation in isolated upstream populations; (2) population and community-level changes that occur when degraded downstream areas act as population “sinks” for source populations of native species upstream or, conversely, as “source” populations of exotic species that migrate upstream; and (3) ecosystem- and landscape-level changes in nutrient cycling, primary productivity, and/or regional patterns of biodiversity. There is a critical need for research at all of these levels.

The U.S. Caribbean National Forest (the largest [11,269 ha, 27,825 ac] natural forest left in the Caribbean Islands) provides a neotropical example of how downstream hydrological alterations and pollution outside of a biological reserve can potentially affect upstream ecosystem dynamics. In contrast to the anadromous salmonids of the Pacific Northwest of the United

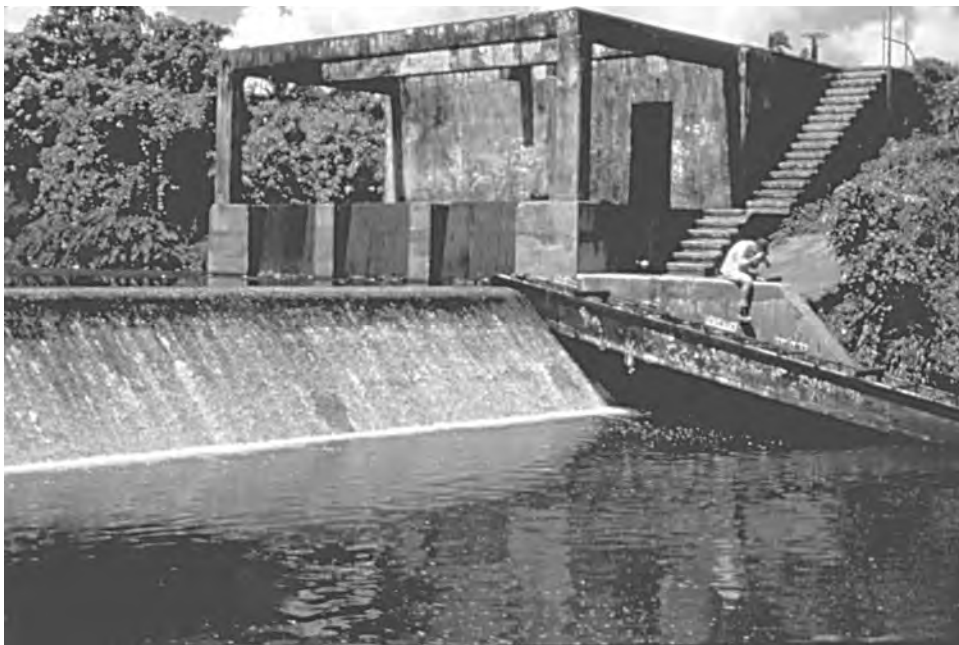


Figure 2—The Espiritu Santo dam and water intake downstream from the Caribbean National Forest in northeastern Puerto Rico. Note the defunct fish ladder (below the dam) and the triple-barred water intake (above the dam sill on the right). Photo by Catherine Pringle.

States, which are often blocked by dams, most of the fishes and shrimps that inhabit the streams of the Caribbean National Forest are amphidromous (drifting to the estuary and/or ocean as larvae, where they spend a relatively short period of time, and then returning upstream as juveniles to spend their adult lives).

Since all of the fishes and shrimps that inhabit the nine major streams draining the forest are migratory (e.g., March et al. 1998), water extraction associated with dams and pollution from sewage treatment plants (in rapidly developing coastal areas) can potentially affect recruitment of adults upstream and related ecosystem processes. For example, low versus high abundances of shrimps can cause interstream differences in algal and insect abundance, algal community composition, and total amounts of benthic organic matter (Pringle et al. 1999). If migratory shrimps and fishes were to be extirpated above dams and water intakes, as has been observed above high dams without water spillways in other regions of Puerto Rico (Holmquist et al. 1998), concomitant changes in ecosystem structure and function might occur. While dams associated with water intakes within and outside of the Caribbean National Forest are not large (usually less than 3 meters; see Figure 2) and they have spillways, the large number of these structures and the volume of water withdrawn from rivers is cause for major concern (Pringle and Scatena 1999; Figure 3). Water intakes result in massive mortality of larval shrimps migrating down to the estuary. During some times of the year, no water is released over many dams and all fish and shrimp larvae suffer direct mortality when they are sucked into the water intake during their migration to the estuary. Recommendations for



Figure 3—Location of the Caribbean National Forest, Puerto Rico, sites of water withdrawals (i.e., intakes for potable water, power generation, private sewage treatment plants, and filtration plants). Figure from Pringle (2000).

improving hydrologic connections between the Caribbean National Forest and downstream adjacent areas include establishment of in-stream flow and habitat requirements of migratory biota and maintenance of minimum flows over dams, installation and upkeep of functional fish/shrimp ladders on dams, and implementation of more environmentally sensitive water withdrawal systems (Benstead et al. 1999).

Beyond the Wilderness Watershed

The sheer magnitude and extent of hydrologic alterations in the global landscape are now affecting wilderness through increasingly broad feedback loops. It is ironic that, just as we are now beginning to understand the complexities of human effects on local hydrologic processes within watersheds, wilderness reserves are being threatened by regional and global processes such as overdrawn aquifers, atmospheric deposition, and global climate change.

Just as watersheds are the natural unit of management for surface waters, aquifers are the natural unit of management for groundwaters. Since both groundwater and surface water are integrally connected and aquifers do not always coincide with watersheds, the management of both aquifers and watersheds needs to be coordinated. Management has generally underemphasized groundwater problems (NRC 1999), all-too-often focusing on surface waters, when in fact, the landscape is composed of a diverse and interconnected mosaic of geohydrologic units (Gibert et al. 1994). In some regions of the world, aquifers and aquifer systems still need to be delineated. In other regions, where aquifer systems have been thoroughly mapped, much research is still necessary to fully characterize groundwater quality conditions and groundwater surface water interactions (e.g., Reetz 1998). The situation is also complicated by fragmented management of small portions of aquifers by jurisdictions with different management objectives.

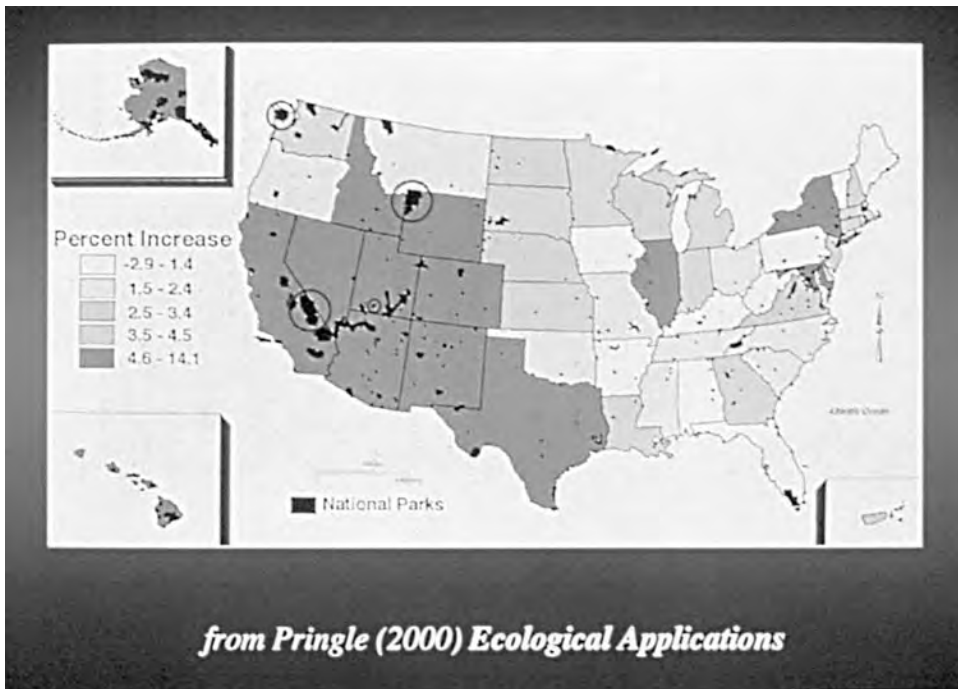


Figure 4—Distribution of national parks in the United States and the projected annual rate of population increase (% per 1,000 population) between 1995 and 2025. Small dots indicate the location of a park that was too small to be drawn to scale. The National Park Service (NPS) manages a network of 368 park units totaling 79 million acres (about 12% of federal land holdings). The United States is participating in water rights adjudications for 50 NPS units in the arid western states. Increasing numbers of water resource conflicts are emerging in the East, and pressure on NPS units are predicted to increase throughout the United States with increasing population growth over the next millennium. (Population data from the U.S. Department of Commerce Bureau of Census [1997]). Figure from Pringle (2000).

The Cumberland Island National Seashore Wilderness Area in coastal Georgia, USA, faces potential water resource problems related to groundwater withdrawals occurring well outside the island's watershed. The island is connected to the mainland by the regional karst aquifer on which the barrier island is perched. Extensive groundwater withdrawals from this regional aquifer have occurred on the mainland, resulting in an approximate 9-meter permanent decline in the potentiometric surface of the aquifer (Johnston et al. 1980, 1981). This is just one example where groundwater withdrawals well outside the boundaries of a wilderness are threatening ecological values protected therein.

Water deficit, defined as the excess of water pumping over recharge from rainfall, has been estimated at 160 billion tons per year on a global basis (Postel 1999). Correspondingly,

groundwater depletion and stream dewatering are contributing to loss and alteration of wetland and riparian ecosystems throughout the world, with particularly strong effects on "protected areas" in arid and semi-arid regions because surface and groundwater are in high demand for human use by burgeoning human populations (Pringle 2000; Pringle 2001 a, b).

The biological integrity of a given wilderness is affected by cumulative alterations of hydrologic connectivity within and outside of its boundaries, from relatively local (e.g., single dam effect), to regional (e.g., cumulative effects of dams, overdrawn aquifers, atmospheric deposition), and global (e.g., climate change) phenomena. The location of a given wilderness in the hydroscape (i.e., juxtaposition with respect to watersheds, regional aquifers, and wind and precipitation

patterns) plays a key role in determining how it will be affected by alterations in hydrologic connectivity. Wilderness reserves in biomes, ranging from arid deserts to tropical rainforests, are vulnerable regardless of their size and watershed location. While an old adage of conservation biology is "the larger the reserve the better," the hydrologic connectivity of large reserves must correspondingly be managed on very large scales that often transcend cultural, political, national, and/or international boundaries. There is an increasing need for innovative new strategies to manage hydrologic connectivity across the boundaries of biological reserves as they become remnant natural areas in the human-dominated landscape.

Hydrologic Connectivity and the Future of Wilderness

The U.S. population is expected to increase from 263 million in 1995 to 394 million by 2050 (U.S. Department of Commerce 1997). Population growth will continue to be highest in arid western states where most public lands are located (see Figure 4). Over the next 30 years, the West is projected to grow at nearly twice the national average, while the Northeast and Midwest will grow at one-half the U.S. total rate (Campbell 1996). Water is largely unavailable to meet new demands in many western states as existing watercourses and aquifers have been fully allocated, and the best dam sites have already been developed.


Increasingly, managers of public lands in the United States are stepping forward and fighting for water rights to meet ecological needs. As a result of their efforts, in some cases water is now being diverted from off-stream uses back to public lands because of

inadequate water supplies to maintain fish and wildlife. The U.S. National Park Service is participating in water rights adjudications in more than 50 national park system units in just the western states (Pringle 2000). Conflicts between the private sector and state and federal governments over the control of water resources are frequent and widespread. Increased pressure to dam rivers and pump aquifers near public lands, as a result of water shortage coupled with increased human demands, are major threats to the biotic integrity of these areas. The Colorado River in Grand Canyon National Park has been so highly altered by stream regulation associated with an upstream dam that it is considered an exotic ecosystem (Johnson and Carothers 1987).

It is important to develop cooperative partnerships between federal land management agencies and both academic and federal scientists. Such partnerships will play a critical role in developing science-based guidelines to manage hydrologic connections across public land boundaries. One landmark example is the trial flood in the Grand Canyon that was implemented at Glen Canyon Dam by the Interior Department's Bureau of Reclamation, in part as a result of scientific requests. In an attempt to restore some of the pre-dam features of the highly regulated dam, managers increased discharge over the dam by more than fourfold during a weeklong period in March 1996. Never had an intentional flood been released specifically for environmental benefits, and more than 30 scientific projects were designed to examine its effects (Collier et al. 1997).

Effective management of effects of cumulative hydrologic alteration outside public land boundaries not only requires more research, but also incorporation of existing scientific information into management actions. A rich

scientific literature exists on hydrologic connections and integrated management at watershed levels that could be more effectively used by public land managers. All too often, however, water resource managers focus on surface waters and, if groundwater resources are recognized, only volume and accessibility receive attention, while water quality and biological characteristics are ignored (NRC 1999). Management and policy must recognize that the flow pathways of surface and groundwater are interconnected along a continuum of geohydrologic units and that the interaction between surface and groundwater influences biological patterns at landscape scales (Pringle and Triska 1999).

The last relatively undisturbed ecosystems in the United States exist on public lands, and they are threatened by mounting human pressures. The development of effective science-based guidelines to manage hydrologic connections across public land boundaries is critical to the long-term stability of these remnant ecosystems. Federal land management agencies are in a transitional phase as they move toward ecosystem management approaches. This provides a window of opportunity for scientists to get involved on a variety of different levels, including research, development of management guidelines, and environmental outreach. 

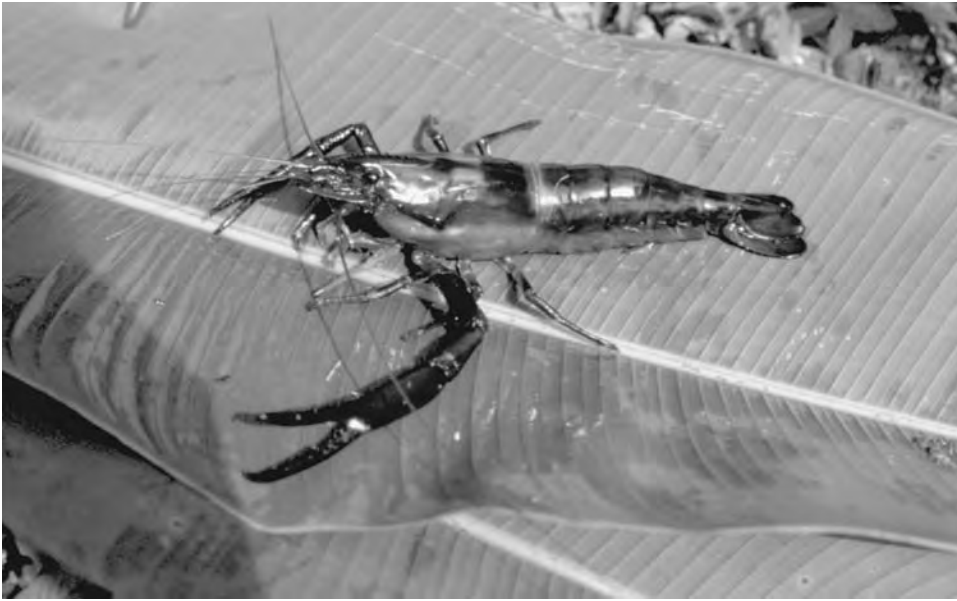
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REFERENCES

- Benstead, J. P., J. G. March, C. M. Pringle, and F. N. Scatena. 1999. Effects of a low-head dam and water abstraction on migratory tropical stream biota. *Ecological Applications* 9: 656–668.
- Campbell, P. R. 1996. Population projections for states by age, sex, race, and Hispanic origin: 1995–2025. Washington, D.C.: Bureau of Census PPL-47.
- Collier, M. P., R. H. Webb, and E. D. Andrews. 1997. Experimental flooding in Grand Canyon. *Scientific American* 276 (1): 82–89.
- Gibert, J., J. A. Stanford, M. J. Dole-Oliver, and J. V. Ward. 1994. Basic attributes of groundwater ecosystem and prospects for research. In J. Gibert, D. L. Danielopol, and J. A. Stanford, eds. *Groundwater Ecology*. San Diego, Calif.: Academic Press, pp. 7–40.
- Holmquist, J. G., J. M. Schmidt-Gegenbach, and B. B. Yoshioka. 1998. High dams and marine-freshwater linkages: effects on native and introduced fauna in the Caribbean. *Conservation Biology* 12: 621–630.
- Johnson, R. R. and S. W. Carothers. 1987. External threats: the dilemma of resource management on the Colorado River in Grand Canyon National Park, USA. *Environmental Management* 11: 99–107.
- Johnston, R. H., R. E. Krause, F. W. Meyer, P. D. Ryder, C. H. Tibbals, and J. D. Hunn. 1980. Estimated potentiometric surface for the Tertiary Limestone Aquifer system, southeastern United States, prior to development. *U.S. Geological Survey Open File Report* 80–406.
- Johnston, R. H., H. G. Healy, and L. R. Hayes. 1981. Potentiometric surface for the Tertiary Limestone aquifer system, southeastern United States, May 1980. *U.S. Geological Survey Open File Report* 81–486.

The last relatively undisturbed ecosystems in the United States exist on public lands, and they are threatened by mounting human pressures.



Costa Rican *Marbrachium carcinus*. Photo by Catherine Pringle.

March, J. G., J. P. Benstead, C. M. Pringle, and F. N. Scatena. 1998. Migratory drift of larval freshwater shrimps in two tropical streams, Puerto Rico. *Freshwater Biology* 40: 261–274.

NRC (National Research Council). 1999. *New strategies for America's watersheds*. Washington, D.C.: National Academy Press.

Postel, S. L. 1999. *Pillar of sand: Can the Irrigation Miracle Last?* New York: W.W. Norton.

Pringle, C. M. 1997. Exploring how disturbance is transmitted upstream: going against the

flow. *Journal of the North American Benthological Society* 16: 425–438.

Pringle, C. M. 2000. Threats to U.S. public lands from cumulative hydrologic alterations outside of their boundaries. *Ecological Applications* 10: 971–989.

Pringle, C. M. 2001 a. Managing riverine connectivity in complex landscapes to protect "remnant natural areas." Plenary talk. *Verhandlungen Internationale Verein. Limnol* 27 (3): 1149–1164.

Pringle, C. M. 2001 b. Hydrologic connectivity and the management of biological reserves:

a global perspective. *Ecological Applications* 11: 981–998.

Pringle, C. M., N. H. Hemphill, W. McDowell, A. Bednarek, and J. March. 1999. Linking species and ecosystems: different biotic assemblages cause interstream differences in organic matter. *Ecology* 80: 1860–1872.

Pringle, C. M. and F. N. Scatena. 1999. Freshwater resource development: case studies from Puerto Rico and Costa Rica. In U. Hatch and M. E. Swisher, eds. *Tropical Managed Ecosystems: The Mesoamerican Experience*. New York: Oxford University Press, pp. 114–121.

Pringle, C. M. and F. J. Triska. 1999. Emergent biological patterns in streams resulting from surface-subsurface water interactions at landscape scales. In J. B. Jones, and P. J. Mulholland, eds. *Surface-subsurface interactions in stream ecosystems*. New York: Academic Press, pp. 167–193.

Reetz, G. 1998. *Water quality in the West. Report to the Western Water Policy Review Advisory Commission*. Denver, Colo.: U.S. Environmental Protection Agency.

U. S. Department of Commerce. 1997. *Demographic state of the nation: 1997*. Special Studies Series. Washington, D. C.: Bureau of the Census, pp 23–193.

Ward, J. V., and J. A. Stanford. 1989. The four-dimensional nature of lotic ecosystems. *Journal of the North American Benthological Society* 8: 2–8.

Winter, T. C., J. W. Harvey, O. Lehn Franke, and W. M. Alley. 1998. Groundwater and surface water: a single resource. *Geological Survey Circular (USA)* 1139.

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mocracy between various social groups and nature. The antirestoration arguments, largely articulated by Eric Katz, argue that restoration reflects human hubris and vanity: "There are no limits to our power and ambition to develop, degrade, restore, and manage the natural world. Nature itself—a nature unmodified by human intention, knowledge, technology and power—will lose its value. . . . We will create for ourselves a totally artificial world, a world in which the presence of human intentionality is inescapable" (p. 47).

This book came from the 1996 restoration controversy that erupted in

Chicago, and the resulting six sessions (26 papers) presented at the International Symposium on Society and Resource Management in 1998. While edited books based on conference presentations often lack focus and contain repetitive passages, the editors have done an excellent job in addressing these potential dangers.

Restoring Nature provides a thought-provoking, challenging, and multidisciplinary analysis of a fascinating issue facing contemporary wilderness and resource managers. The book succeeds because it forces the reader to confront the

many difficult questions regarding ecological restoration posed by writers representing different disciplinary and ideological perspectives. Managers of areas from wilderness to urban parks will be increasingly brought into the restoration fray (e.g., the prescribed burning issue), and they would be well advised to consider the wealth of ideas, case studies, practical management techniques, and perspectives offered in this book.

Reviewed by JOHN SHULTIS, *I/JW* book review editor. E-mail: shultis@unbc.ca.

Restoring Old Roads and Maintaining Water for Wildlife in the BLM Maricopa Complex Wilderness in Arizona

BY RICH HANSON and JIM MAHONEY

The Maricopa Complex Wilderness includes 172,000 acres of lower Sonoran desert, located about 20 to 30 miles southwest of Phoenix, Arizona. Four wildernesses were designated by the Arizona Desert Wilderness Act of 1990 (P.L. 101-628)—Sierra Estrella, North Maricopa Mountains, South Maricopa Mountains, and Table Top—and are referred to as the Maricopa Complex Wilderness. The Bureau of Land Management (BLM) manages the Maricopa Complex Wilderness and surrounding lands.

The Maricopa Mountains (1,000 to 3,000 feet elevations) include ridgelines and isolated peaks separated by gullies and wide washes, and include a representation of many Sonoran Desert plant species such as saguaro, cholla, and ocotillo. Desert wildlife includes mule deer, javelina, desert bighorn sheep, desert tortoise, coyote, and many varieties of lizards and birds.

The wilderness appears natural, with little or no evidence of human disturbance besides old roads and vehicle tracks, cattle grazing fences and water devices. The area provides outstanding opportunities for solitude and naturalness since it is generally inaccessible due to rugged terrain and rough access roads. Annual visitation by recreation users is estimated as fewer than 2,000 visitor days, mainly day-hiking, dispersed across the open terrain or over a few marked trails and along old roads, and with some use by visitors on horseback. The demand for recreation access to these wildernesses is expected to increase over the next decade due to its close proximity to Phoenix and a population of more than 2 million people (USDI Bureau of Land Management 1995).



Article authors Rich Hanson and Jim Mahoney mark a trail with a rock cairn to concentrate travel in this fragile desert landscape. Photo by Marilyn Riley.

A management plan for the Maricopa Complex Wilderness was completed by the BLM in 1995 for implementation over a 10-year period. The plan addressed five categories of issues: (1) protecting and enhancing the natural character of wilderness, (2) providing opportunities for solitude and primitive recreation, (3) managing other land uses and activities provided for by The Wilderness Act, (4) managing wildlife, and (5) managing vegetation. Two of the more notable management problems and actions to address them are described here: removing evidence of old roads and former vehicle access, and maintaining wildlife water development structures built prior to wilderness designation.



A stand of saguaro cactus and cholla in the lower Sonoran Desert of the Maricopa Mountains. Photo by Chad Dawson.

... old roads and vehicle tracks can take 50 to 100 years or more to heal naturally in the arid, southwest desert.



Jim Mahoney inspects a vandalized North Maricopa Mountains Wilderness sign. Photo by Marilyn Riley.

Old Roads

In 1995 there were approximately 95 miles of old roads and vehicle routes in these four wilderness areas, and due to the sparse vegetation and open terrain, illegal vehicle access created further tracks. This was a major concern since old roads and vehicle tracks can take 50 to 100 years or more to heal naturally in the arid, southwest desert. Further, the boundary designations provided for some primitive dirt roads to continue to exist for some distance into the wilderness area (i.e., “cherry stems”). Thus, an important management approach was to install boundary markers and vehicle barriers along the cherry stems, and to reduce evidence of the 95 miles of old roads and vehicle routes by rehabilitating 16 miles of them to trails, restoring 19 miles to natural conditions, and allowing 60 miles to rehabilitate naturally. By 2000, notable progress had been made. For example, several miles of old roads were rehabilitated in the North Maricopa Wilderness by removing the middle and edge berms, loosening and leveling the soil, and then replanting the moved vegetation to narrow the pathway. Rocks and dead vegetation were likewise “transplanted” to look like the surrounding area (see photos).

Water Facilities for Wildlife

Another key management issue was wildlife water development structures—eight rainwater catchments, “guzzlers” and one well, all used by wildlife such as mule deer and desert bighorn sheep. These wildlife water development structures were considered necessary in the wilderness to maintain the herd of 200 to 300 desert bighorn sheep whose historic migration routes to water had been

cut off by highways and agricultural or residential developments on adjacent lands. For these reasons the wildlife water development structures were allowed to stay and be maintained and, at times, refilled by water trucks driving into the wilderness areas or by helicopter. But to reduce the need for continued mechanized intrusions by water-supply vehicles, the reconstruction of six wildlife catchments was proposed to make them self-supplying from natural water sources.

For example, in the North Maricopa Wilderness, the 1995 plan authorized construction to make an existing water facility self-sustaining. This guzzler, built in 1958 with a 2,500-gallon tank and a concrete catchment pad, had to be refilled periodically by water truck in the dry season, even when fenced to exclude livestock permitted to graze seasonally in the area. In 1996, using mechanical equipment as allowed under the Arizona Desert Wilderness Act of 1990, a permanent wildlife water system was constructed by the BLM with three additional 3,150-gallon underground tanks, all connected to the existing tank and catchment apron through a gravity feed system (see photos).

While such construction activities in wilderness are controversial, the intrusion has eliminated the need for water trucks to enter the wilderness to refill the original small tank, and it now provides an annually sustainable supply of water for desert bighorn sheep and other wildlife. To complete the project the truck road on which water used to be hauled to the guzzler is being rehabilitated to encourage its restoration to natural conditions. ♪



Rehabilitating old roads originally constructed for grazing and mining into recreation trails is especially difficult in arid desert landscapes. Photo by Chad Dawson.



Rich Hanson points to wildlife water development structures built in 1958 in what is now the North Maricopa Mountain Wilderness. Photo by Chad Dawson.

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REFERENCES

U.S. Department of Interior, Bureau of Land Management. 1995. *Maricopa Complex Wilderness Management Plan, Environmental Assessment and Decision Record*. Arizona State Office, Phoenix District Office.

The Ocean Wilderness Challenge

BY ROGER RUFÉ

The word *wilderness* traditionally conjures up images of wild, uninhabited, and untamed land. But this picture can also be painted for the vast wilderness of the world's oceans. Beneath our seas lies a fantastic world teeming with diverse ecosystems and thousands of species. Comprising about 70% of the Earth's surface, these abundant ocean resources have long been taken for granted. For centuries, the oceans were considered a vast and resilient realm, impenetrable to damage or destruction. Today they show unmistakable signs of abuse and neglect. Changes must occur to protect the oceans and their ecosystems.

Building on a nearly 30-year record of landmark achievements in protecting oceans and marine wildlife, The Ocean Conservancy (TOC) has developed the Ocean Wilderness Challenge. The challenge aims to achieve wilderness protection for 5% of U.S. waters and educate the public about the vital role the ocean plays in all of our lives. As a nation, we need to value our oceans just as much as we value our land. We must view the oceans in a new way—not as an

infinite and inexhaustible resource, but as a national and global treasure that is at risk.

The United States' ocean territory encompasses more than 4 million square miles of coastal waters and open seas. However, less than one-tenth of 1% of that entire area is protected from "extractive uses" such as fishing, oil drilling, dredging, or sea-floor mining.

Why Ocean Wilderness?

The value of wilderness was familiar to most Americans decades before the 1964 Wilderness Act designated areas to be set aside by the federal government. As defined in this historic legislation, wilderness areas are places "where the earth and its community of life are untrammelled by man." The Wilderness Act, however, was limited largely to preserving valuable land areas. It was only very recently that preserving ocean wilderness began to take hold as an equally desirable goal.

Calls for increased wilderness protection for the oceans have coincided with a greater understanding of the wild world that exists just under the waves. More than 95% of our oceans are unexplored. But from the 5% that has been explored, we know oceans are home to diverse and complex ecosystems that range from calm seagrass beds to active underwater volcanoes, from biologically rich coral reefs to 600-degree-Fahrenheit hydrothermal vents—each a delicate, balanced ecosystem relying on all of its parts to survive and adapt to the ever-changing conditions of life.

In the same way that we are coming to appreciate the wilderness of the oceans, we also are seeing that the oceans are not immune to the "imprint of man's work." From water pollution to oil drilling, from commercial fishing to seaborne shipping, from vessel groundings to invasive species, human activities have fundamentally altered the nature of our oceans.

Protecting areas of the ocean as wilderness can help turn back the clock by restoring fish and wildlife populations,



A Humpback Whale along the Alaskan coast. Photo by Doc White/Innerspace Visions.

preserving precious marine ecosystems such as coral reefs, and helping to maintain the oceans' biodiversity—all of which can provide significant economic benefits. Healthy, functioning ocean ecosystems, for example, can help bring back some of the fish species that have been devastated by overfishing. In addition, whale-watching tours, dive shops, and beach communities will benefit if our oceans are healthy and unpolluted.

Even more important than the economic benefits are the less quantifiable benefits that come with setting aside a piece of the Earth for protection from harmful human activities. Protecting North America's ocean wilderness is tantamount to protecting something inside ourselves—that memory of being at the beach as a child and looking out at the vast blue-green expanse and imagining another world. It is about knowing in our hearts that there are still places where wild creatures can live and flourish. We must shift our focus from the oceans as fish warehouses and dumpsites and focus on them as natural ocean communities to be cherished and protected.

From Land to Sea: Broadening the Conservation Ethic

The National Wilderness Preservation System now includes 643 wildernesses covering nearly 106 million acres of land—the equivalent of nearly 5% of all of the land in the United States. It is now time to apply that same goal to our oceans.

The United States already has established 13 National Marine Sanctuaries in its ocean territories, and a 14th is in the process of being established in the Northwestern Hawaiian Islands. These sanctuaries were established to

conserve, protect, and enhance their biodiversity, ecological integrity, and cultural legacy. Sanctuary designation does not automatically convey total protection, however. For example, commercial fishing is allowed in most areas of most U.S. marine sanctuaries. Adding to the problem, many sanctuaries are operating under management plans that are more than 20 years old and that don't come close to providing an adequate level of protection for the full range of marine species and habitats.

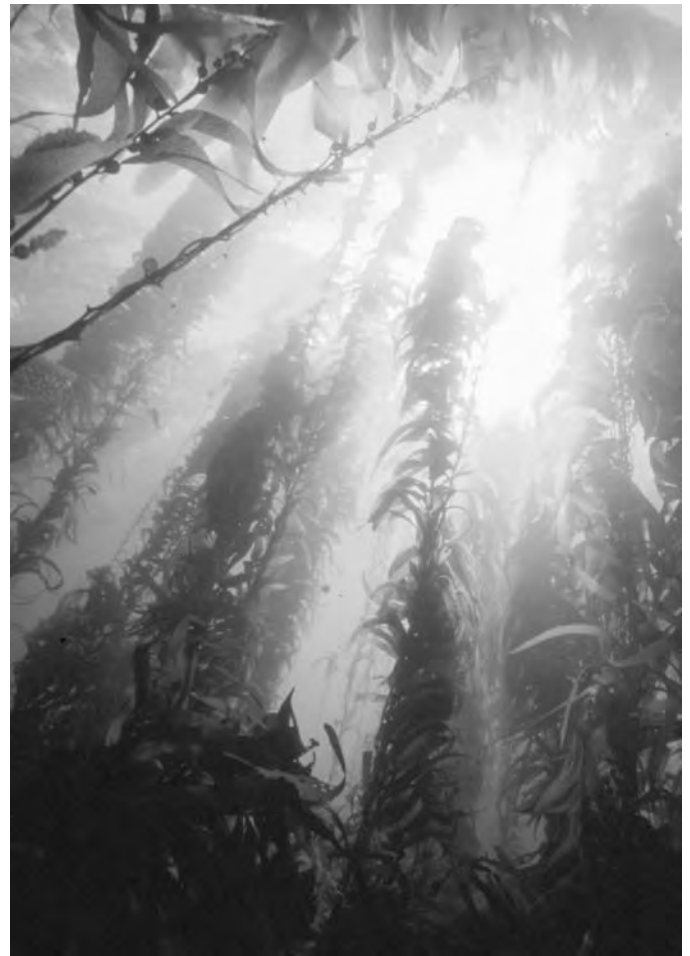
The Ocean Wilderness Challenge

TOC has identified five national sites and one international site that it views as the beginning of a strategy to preserve ocean wilderness in North American waters and beyond. The sites include Glacier Bay and Prince William Sound in Alaska, the Northwestern Hawaiian Islands, the Channel Islands off the southern California coast, Florida's Dry Tortugas, and the San Andrés Archipelago off the coasts of Nicaragua and Honduras. While one could argue that the entire ocean has value as wilderness, these six sites are special; they contribute immensely to the planet's overall health and, at the same

time, are increasingly vulnerable to damage and degradation.

Prince William Sound (Alaska)

A refuge from the storm, Gulf of Alaska, Prince William Sound provides incredibly diverse land and seascape shelters and sustains a wide array of marine and terrestrial wildlife, including many rare and endangered species, as well as millions of Pacific salmon. Since the March 1989 Exxon *Valdez* oil spill, oil still remains on the beaches and only two of the 23 wildlife species affected by the



Kelp forest in the Channel Islands, National Marine Sanctuary, California. Photo by Doug Perrine/Innerspace Visions.

As a nation, we need to value our oceans just as much as we value our land.

We must shift our focus from the oceans as fish warehouses and dumpsites and focus on them as natural ocean communities to be cherished and protected.

spill have recovered. Making matters worse, the global attention that accompanied the spill has caused Prince William Sound to become an international tourist attraction, which is putting even greater pressure on habitats and species.

Channel Islands (California)

The Channel Islands, five in a chain of eight islands near Los Angeles, reside in one of only two places on Earth where two ocean currents—the warm Californian water mass originating near the equator, and the cold Alaskan water mass—collide. The result is a one-of-a-kind biological hotspot renowned for its diversity and abundance of fish, marine mammals, and other ocean life, including the largest congregations of the blue whale—the biggest animal on Earth. The Channel Islands National

Marine Sanctuary is under ever-present danger from oil and gas development, overfishing, land-based pollution, and recreational overuse. Currently, sanctuary managers are in the midst of a process in the Channel Islands to decide which places within the sanctuary should be closed to all fishing.

Glacier Bay (Alaska)

Located northwest of Juneau, Glacier Bay is a designated national park and preserve encompassing more than 3 million acres of spectacular lands and waters. More than one-fifth of the park is purely marine and home to 200 species of fish, including all five species of Pacific salmon. In addition, Glacier Bay is an important foraging ground for several marine mammal species, including the Steller's sea lion and endangered

humpback whale. Some park waters have been designated as wilderness, but no areas are closed to all fishing and the ecosystem is threatened by increased tourism development.

Northwestern Hawaiian Islands (Hawaii)

The Northwestern Hawaiian Islands, approximately 120 nautical miles west of the main Hawaiian Islands and stretching northwest for more than 1,200 nautical miles, are home to the Hawaiian monk seal, the most endangered marine mammal found exclusively in U.S. waters. Today, only about 1,300 Hawaiian monk seals remain. One reason the seals are under threat is because the islands and their reefs trap tons of derelict fishing gear and other waterborne debris coming in on the currents, much of it originating thousands of miles away. Since 1982 observers have reported 155 monk seal entanglements. And, because reefs are essential habitat for fish, sea turtles, sharks, and other ocean life, the debris threatens a wide array of species, as well as the coral reefs themselves. In December 2000, a presidential executive order created the Northwestern Hawaiian Islands Coral Reef Reserve, which provides a framework for permanent no-take protections.

Dry Tortugas (Florida)

The Dry Tortugas are a historic and beautifully remote cluster of seven islands 70 miles west of Key West and 170 miles from mainland Florida. The islands themselves have been protected as a national park since 1992. The Tortugas are known for their clear, clean waters, their coral reefs, and their fish, sharks, lobsters, and other ocean creatures. Until recently, the area's remoteness and a prohibition on commercial fishing inside Dry Tortugas National Park provided some protection for the



Hawaiian monk seal. Photo by David B. Fleetham/Innerspace Visions.

area. However, fishing pressure from commercial vessels outside the national park and recreational users throughout the area has increased dramatically and is causing damage to the Dry Tortugas underwater ecosystem. A formal process to establish two areas as no-take reserves is almost complete. Pending action to fully protect an adjacent area within the Dry Tortugas National Park would complete the process of preserving this truly world-class ocean wilderness covering almost 200 square nautical miles. The specific boundaries for the area, known as the Tortugas Ecological Reserve, were recommended by a diverse working group of fishers, divers, and conservationists.

San Andrés Archipelago (Colombia)

Colombia's San Andrés Archipelago, located in the Caribbean Sea near the coasts of Honduras and Nicaragua includes several species of coral and over 270 species of fish. The archipelago's rich biological diversity is threatened by overfishing, improper waste disposal, and a fast-growing human population. The Ocean CORALINA is the government agency responsible for the archipelago's sustainable development and developing a system of four Marine Protected Areas, each of which includes ocean wilderness areas.

There are ten components to TOC's Ocean Wilderness Challenge:




Smallmouth grunts schooling under elkhorn coral along the Florida coast. Photo by Doug Perrine/Innerspace Visions.

1. Define and accomplish ocean wilderness designation for 5% of ocean areas from the shoreline to the 200-mile limit of the U.S. Exclusive Economic Zone.
2. Collaborate internationally to protect ocean wilderness beyond the U.S. Exclusive Economic Zone.
3. Establish ecosystem-based management as the new paradigm for ocean management.

4. Build an effective Marine Protected Area network, including substantial no-take reserves that underpin wilderness everywhere.
5. Use ocean wilderness to lead a new way of thinking about and seeing our oceans through a positive conservation lens, rather than an extractive one.
6. Work at the local level to identify and secure specific ocean wilderness sites in each region of the country and internationally.
7. Help state governments get ocean wilderness designated in state ocean waters.
8. Conduct a nationwide dialogue on ocean wilderness in 2001 in key regions leading to a National Ocean Wilderness Summit in 2002.
9. Obtain 1 million signatures from the public in support of a new ocean ethic and ocean wilderness.
10. Work with national and state education organizations to include marine science in national science education standards.

In the months and years ahead, TOC will be working to achieve wilderness designation for each of the six flagship sites. Equally important, in order to achieve the goal of seeing 5% of U.S. oceans protected as wilderness, TOC will be launching a broader effort to make ocean wilderness a mainstream issue for all Americans whether they live in Nebraska or Florida. Baba Dioum, a Senegalese conservationist, notes that "In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught."

TOC wants Americans to embrace the need to protect special ocean areas with the same enthusiasm they show for Yellowstone, Yosemite, and Mount Rainier. TOC wants people to look out on the ocean with a new appreciation for what's under the water and to realize that we are all responsible for protecting our oceans—we are their only hope. 

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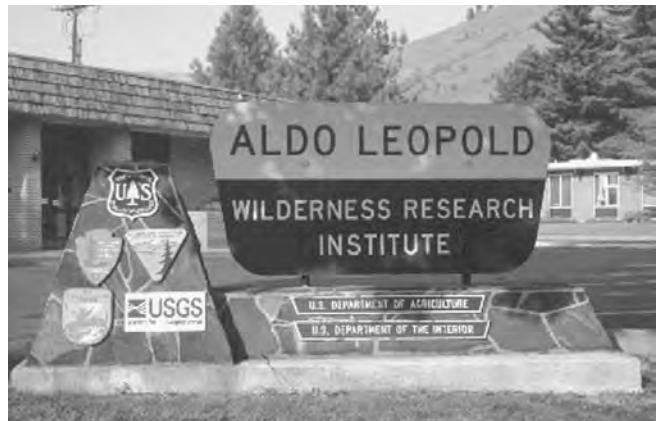
A Focus on Circumpolar North Wilderness Values

BY ALAN E. WATSON


What are the most important arctic and subarctic wilderness research topics for the next five years? In an effort to answer this question, a group of 80 scientists, state and federal managers, members of indigenous northern cultures, nongovernmental organization representatives, students, and wilderness users gathered from May 15 through 17, 2001, at the University of Alaska in Anchorage (UAA) to share information and plan for future collaboration on northern wilderness research issues. This meeting was co-chaired by Lilian Alessa of UAA and Alan Watson of the Leopold Institute, with sponsorship from the National Science Foundation (Office of Polar Programs), International Programs of the Forest Service, the Alaska Office of the US Fish & Wildlife Service, and the University of Montana's Wilderness Institute.

For three productive days, participants from Iceland, Canada, Norway, Finland, Russia, Denmark, and the United States defined the most serious threats and immediate opportunities to protect the values associated with wild places in the circumpolar North. They heard about the latest trends in tourism, efforts and needs to protect traditional relationships with nature, and increasing values associated with protection of unique arctic ecosystems. Participants then provided input on high priority information needs and the needs for advancement in research methods to address unique issues in the Arctic. Discussions were initiated on the priorities for education and how to accomplish them, as well as how to develop a forum, or working group, to continue the interdisciplinary and international dialogue.

Among the highest priority research topics identified was the need for better understanding of how to create awareness and appreciation of the divergent range of relationships people have with circumpolar North wilderness. Some of the relationships discussed include the perspectives of native people and their traditional relationships with wild places, the uninformed visitor, the nonvisiting public, the economic values associated with protection as wilderness, industrial develop-



ment values, personal growth opportunities, and those represented by legislation that establishes wilderness protection or protects wildness (e.g., U.S. Wild and Scenic Rivers Act, the Alaska National Interest Lands Conservation Act). The greatest need for research on threats to wilderness in the circumpolar North centers on energy resource development impacts and tourism promotion.

Abstracts from the presentations are posted at www.forestry.umt.edu/kiosk/seminars/circumpolar and submitted papers are being compiled into a book for publication in the near future. Important commitments were made by many participants to continue to work as a coordinated group to further share information and resources, coordinate research and advances in science methods, and work toward education of all interests about the many and sometimes conflicting values associated with the protection of wild places as wilderness. To assure the effectiveness of these future collaborative efforts in Alaska, it was generally agreed that industrial and commercial interests need to join current participants in a continuing dialogue focused on understanding the values and threats associated with wilderness protection. 

For more information contact LILIAN ALESSA, e-mail: lil@uaa.alaska.edu, or ALAN WATSON, e-mail: awatson@fs.fed.us.

The Toda People

Wildland Plants and Values

BY TARUN CHHABRA

The Todas are the ancient inhabitants of the upper Nilgiri plateau in southern India. They refer to themselves simply as *Awl*. With their striking countenance, curious barrel-vaulted temples and houses, unique dairy temple rituals, and ferocious looking buffaloes, they have fascinated the world ever since these hills were opened up to “civilization” 180 years ago.

The Toda culture has a central commitment to both the sacred buffalo and its milk, as well as to wildland plants and values. They have six grades of dairy temples, each of which has a corresponding herd of sacred buffaloes. Only a man who undergoes the elaborate ordination ceremonies specific to each grade can become the priest (in the process, using a variety of specific floral species considered purificatory), and then can milk the corresponding grade of sacred buffaloes and ritually process it into butter, buttermilk, curd, and ghee (clarified butter). While doing so, a mind-boggling array of rituals are incorporated, and many of these are specific to each grade of temple.

When outsiders first arrived in the upper Nilgiris, it was one great Toda wilderness. Now, vast areas have been taken over by civilization—tea gardens, townships, exotic tree plantations, and hydel reservoirs. Fortunately, the British, perhaps understanding their close link with nature, did not relocate the Todas to new areas. Sadly, modern government seems not to care: abandoned *Ti* dairy sites—the most sacred grade of temples—are planted with exotic trees; the sacred hill of the creator goddess *Teikirshy* is quarried for stone; and sacred migratory routes are blocked by reservoirs and tree or tea plantations.

Despite inhabiting the Nilgiri hills since ancient times, how did the Todas manage to preserve, and indeed, manage their wilderness so perfectly until modern incursion overran much of their land? The answers are manifold—one, by staying within the cycle of nature and, therefore, keeping their own population to a minimum (even today, only 1,300 persons); two, since they had to use specified

plants for various lifetime rituals, the environment around their immediate homeland had to be used sustainably; lastly, many elements of the wilderness in their vicinity were considered sacred to the Todas.

The homeland of the Todas is a relatively small area, but is home to around 90 endemic plants that are seen nowhere else in the world. The Todas have a name for every important plant (several hundred species), such as the Shola tree, or other grasses, herbs and plants in the upper Nilgiri plateau. Many of these plants are used in various rituals, others have medicinal values, and some play a role in different aspects of daily life. For example, by looking at the plants in flower and the species of pollinating bees, the medicinal properties of the honey gathered in the vicinity can be ascertained. The Todas have traditionally used flowers to tell the time of the day and the six o'clock flower (*Oenothera tetraptera*) that blooms at almost exactly that time every evening, irrespective of weather conditions, is a well-known example.

From their ancient songs and stories, it is known that several of their essential items are modeled after nature. For example, their barrel-vaulted houses are inspired by the rainbow, and their unique cane milk-churning stick by a flower. And indeed, the blooms of *Ceropegia pusilla* are identical to a miniature churning stick! There is even a flower called *arkilpoof* (*Gentiana pedicellata*), which literally means “the worry flower.” This flower, when held by the stem, indicates one’s level of anxiety—if you are worried, then it can close in a flash. Or if



Article author Tarun Chhabra. Photo by Michel Danino.



A Toda priest at a newly rethatched temple. Photo by Tarun Chhabra.

there are less worries, it could take a few minutes to close. If you are one of those carefree persons, the flower would stay open!

The Todas are able to predict the various seasons of the year by looking at certain plants in bloom. The southwest monsoon could be raging with all its fury, but the elder can predict the coming end of the monsoon nonchalantly. This is just by observing the mass flowering of the *mawrsh* (*Michelia nilagirica*) trees in the Shola thickets. Todas have a name for different stars that are visible during the night sky and an identical name for the weather pattern of that period and the same name corresponding with a prominent herb in flower at the same time. There are 28 such star-weather-herb combinations.

The Toda homeland is home to 40-odd species of balsams—perhaps the largest concentration of these species for its size. Of these, a dozen are totally endemic.

Every mandatory lifetime ritual for traditional Todas requires the use of several floral species that are specified and cannot be substituted under any circumstance. For example, the pregnancy and paternity rites entail the use of the following plants: *Ochlandra* sp. of bamboo reeds; *Mappia foetida* leaves; rhododendron *Arboreum* ssp. *nilagiricum* sticks; *Rubus ellipticus* leaves; *Myrsine capitellata* branches; *Eugenia arnottiana*; *Sophora glauca*; and *Andropogon schoenanthus* grass. So if all the species that are used in a Toda's lifetime rituals and cultural uses were to be counted, we would have a total

of more than 100 plant species that they require in the vicinity.

The construction of temples also requires the use of only specific species, such as stone or specified tree wood for the planks; *Sideroxylon* sp. tree poles; rattan cane—*Calamus pseudotenuis*; *Arundinaria wightiana* bamboo; *Ochlandra* sp. bamboo reeds; specified wood for the door and the carved *kweghaishveilz* like a totem in front; a rare thin bamboo reed called *theff* (only recently identified as *Pseudoxytenanthera monadelphica* [Thwaites] Soderstrom and Ellis from samples sent by us to a bamboo expert, Dr. Muktesh Kumar); and the thatch grass now provisionally identified as *Dichanthium polyptychum* (Steud.) *camus* var. *deccanense* Bor. This thatch grass called *avful* by the Todas was once seen in swamps all over their homeland. Now it is restricted to a few distant swamps and only seen in patches. The possible reasons could be the planting of exotic trees such as eucalyptus and acacia, the prohibition of Toda grassland firing rituals by the forest department, and overgrazing in some areas. The WILD Foundation (USA) has initiated the support of a project to study, save, and perhaps later, propagate this valuable species. It is to be remembered that the Todas are not allowed to substitute the thatch on their temples with other species (except in a couple of hamlets in the extreme east) and, therefore, if this grass were to become locally extinct, then the unique cultural heritage of the Todas would collapse.

Most elements of the wilderness that surrounds the Toda homeland are considered sacred. Therefore, a typical prayer chanted by the priest has specific (to each temple) chant names called *kwarshm* for various sacred natural landmarks that include the peaks, slopes, valleys, ridges, pools,


Every mandatory lifetime ritual for traditional Todas requires the use of several floral species that are specified and cannot be substituted under any circumstance.

streams, rivers, caves, rocks, Shola thickets, trees, swamps, meadows, and other features of the area. If all the prayers were to be studied, then we would have a corpus of several hundred such sacred sites.

During the earliest times, the gods lived among the Todas. Each of their life stories is well known to many Todas, and natural landmarks associated with their exploits still exist. These gods and goddesses, after their time, went on to occupy various hill summits where they are still believed to reside. These are called *theo thit*, or “deity peaks,” of which there are more than thirty. Even today, a Toda elder would not commit the sacrilege of pointing out the location of a deity peak with his finger—he would, in all likelihood, point at the neighboring hill and say, “The peak next to that.”

After the deity peaks, there are also very sacred hills that are usually like deity peaks to one or two clans. Then there are hills of sanctity to a couple of clans. Lastly, are the locally sacred hills that are mentioned in the prayers of a few temples in that vicinity. The Toda sacred hills are the core of the Toda wilderness—a wilderness under great threat. If it is to survive or revive, then the following need to be implemented forthwith:

- Declare the Toda deity hills as World Heritage Sites and then protect them accordingly.
- Declare much of the wilderness encompassing the deity peaks as an area of aboriginal sanctity.
- Remove exotic tree plantations from these sacred areas and sacred migratory routes.

For the sake of the Toda people and world cultural and ecological diversity, we must work to save the Toda wilderness. 



A Toda priest with a sacred buffalo. Photo by Tarun Chhabra.



A Toda couple. Photo by Tarun Chhabra.

TARUN CHHABRA is a practicing dentist who helped found the *Toda Nalavaazhvu Sangam*, an organization that strives to keep Toda culture intact. Since its inception, several unoccupied dairy temples and migratory hamlets have been restored. Of late, a project to revive traditional housing has resulted in

the construction of almost 30 new structures. In his study of Toda ethnobotany, Chhabra has photographed more than 200 wild Nilgiri flowers. He is an authority on the wild balsams of the Nilgiris, and the white rhododendron that he discovered is named after him by the Royal Horticultural Society.

An Update on Wilderness Conservation in the New South Africa

BY WILLIAM R. BAINBRIDGE

Introduction

This article follows the synopsis of mountain wilderness areas and a historical account of wilderness management in South Africa (SA) in *IJW* (vol 7, no. 2, Bainbridge 2001a). It attempts to provide an update and short overview of the status of the wilderness areas of SA as a component of the national protected area (PA) system, in the context of the new South Africa, following the democratic elections in 1994. It also provides some insights into the present status of the wilderness system and considers some of its values and future prospects for improved legal protection.

SA has played a leading role in the establishment and management of protected areas in Africa for more than a century, since proclamation of the first reserves on the continent in 1895 (Pringle 1982). The national system comprises more than 400 individual areas that cover about 6% of the land surface and about 5% of marine and coastal environments. This includes 11 legally designated wilderness areas and a number of wilderness zones on other protected area categories. These, however, have only been established in the past 50 years. The total extent of the designated wilderness areas is small in comparison with that of all other PAs, forming less than 3% of the PA system numerically and only 0.5% of the total extent (Department of Environment Affairs & Tourism [DEAT] 2000; Bainbridge 2001b).

Most of the PA system was designated prior to the new political dispensation brought about in 1994. Since the election in that year, which brought to power the democratic government led by Dr. Nelson Mandela, some important advances have been made in nature conservation in this country. In the first instance, the national PA system has

been extended by some 380,000 ha (938,300 acres), and several new marine protected areas have been declared. Also, an official announcement has been made to further increase the extent of the terrestrial system up from 6 to 8% (DEAT 2000). In the second instance, a Board of Investigation headed by Mr. Justice Kumbleben was constituted to



Article author William R. Bainbridge

investigate and make recommendations on the institutional arrangements for nature conservation in SA. These developments are likely to bring significant benefits to the country and its citizens. They include the development of a conservation model and institutional arrangements aimed at rationalizing the PA system, in order to optimise biodiversity conservation and economic development. The PA system should also have significant benefits for wilderness conservation.

The Key Role of the PA System in Protection of the National Biodiversity Resources

SA is a country rich in biodiversity resources, on which the livelihoods of many of its people depend. It is recognized as one of the three most biologically diverse countries worldwide, characterized by seven biomes and nearly 70 distinct vegetation types. These have high levels of species-richness

and high levels of endemism. SA is a signatory to the Biodiversity Convention, and in fulfilment of its obligations and responsibilities in terms of this, has published a national biodiversity conservation strategy, *the White Paper on Conservation and Sustainable Use of South Africa's Biological Diversity* (1997). This states that these resources are at risk. Both plant and animal species are overutilized by both commercial and subsistence use. There is growing awareness of the need for decisive action to be taken for the protection of both the national terrestrial and marine resources. The national PA system forms a key role in the overall national strategy to achieve this. Bainbridge (2001b) indicates aspects of the significant contribution made by the wildernesses toward these aims.

Legal Protection of the Protected Area System

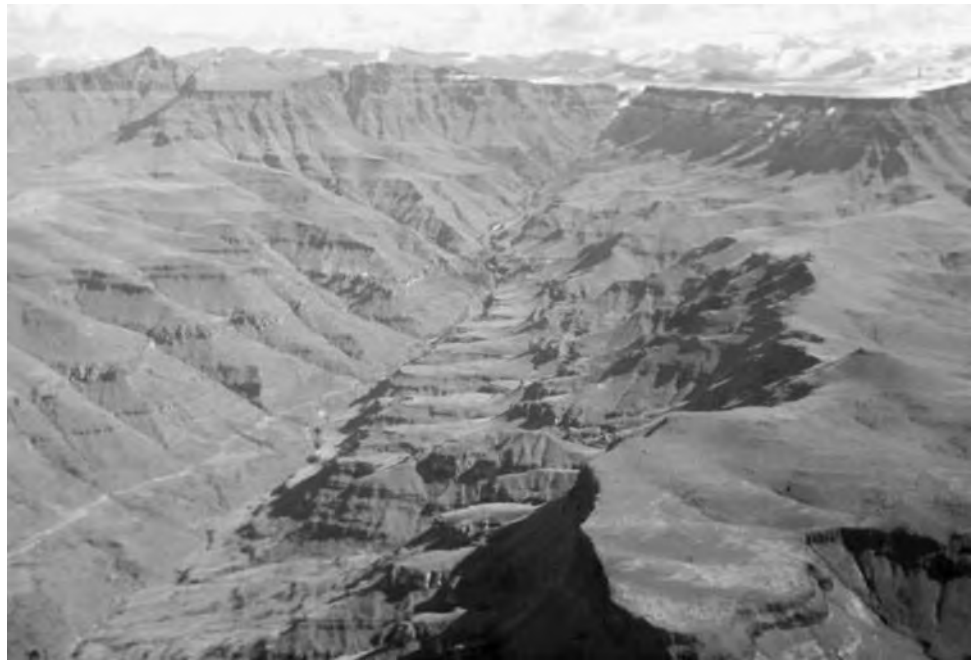
The national PA system was established in a somewhat haphazard and uncoordinated manner, largely according to historical circumstance. The range of protected area categories has been proclaimed in legislation at both national and provincial levels, with considerable variation in the form of legal protection afforded. The *White Paper* outlines the situation as follows:

The fragmented, polarised, and inefficient administrative and legislative structures created by apartheid resulted in no fewer than seventeen government departments having primary responsibility for nature conservation prior to the 1994 election. This situation did not improve with the establishment of new provinces and government structure. Divided responsibilities, together with a duplication of effort, a profusion

of laws, and, most importantly, a lack of coordination, have been major factors hampering the effective conservation of biodiversity. Aggravating this has been a lack of integration of biodiversity considerations into national decision-making, weak political will with regard to environmental conservation, and the insufficient and declining allocation of resources to conservation. Over and over again, the need to link biodiversity conservation to the needs of South Africa's people has been highlighted as a major concern, as well as the importance of integrating conservation into an overall strategy for conserving and using natural resources sustainably.

As an example of the somewhat haphazard approach to protection of the national PA system, there are some 19 national parks proclaimed under the provisions of The National Parks Act of 1976. This provides secure protection against incursion or nonconforming land uses, such as mining. In

contrast, the statutes by which provincial PAs are protected do not enjoy the same levels of protection, especially against mining. Yet, while the National Parks Act provides protection to some of the most important PAs in the country (such as the Kruger National Park),



Sani Pass, Ukahlamba-Drakensberg Park World Heritage Site, providing one of the few roads linking KwaZulu-Natal Province, South Africa (foreground) and Lesotho (background in snow). The pass is flanked on the south of the Mzimkulu Wilderness Area, and on the north by the Mkhomazi Wilderness Area. Photo by William R. Bainbridge.



Woollynecked stork, southern portion of the lake wilderness, Great St. Lucia Wetland Park World Heritage Site. Photo by William R. Bainbridge.



Hippopotamus in the lake wilderness, Lake St. Lucia Wetland Park World Heritage Site. The lake holds the largest population of this species in South Africa. Photo by William R. Bainbridge.

in terms of the biodiversity and other resources they conserve, some national parks must be considered significantly less important than certain of the provincial PAs (Kumleben et al. 1998).

The Forest Act is part of national legislation, and until recently, was the only statute that made provision for

the designation of wilderness areas. It also provided a higher degree of legal entrenchment than that enjoyed by provincial legislation (except against mining). However, it is only applicable to state forest land, and could not be employed for the designation of wilderness areas on other land. Recently,



Male Kalahari lion, Kgalagadi Transfrontier Park, shared between South Africa and Botswana. A top predator of the candidate wildernesses in one of the premier protected areas of the two countries. Photo by William R. Bainbridge.

the KwaZulu-Natal Nature Conservation Management Act of 1997 has been amended to enable the declaration of wilderness areas, but this is only applicable to PAs in that province.

Possible New Legal Status for Wilderness Areas

The report of the Kumleben Board of Enquiry has presented important recommendations to government to redress a number of these problems. New legislation is currently being drafted to implement the national strategy for conservation of biodiversity resources defined in the *White Paper*. Of particular significance for wilderness areas and important provincial reserves, the board recommended the following:

There should be a scientific appraisal of all existing PAs, to determine those that qualify for such status, and at the same time, to determine the category in which an approved PA should be included. The protected areas thus determined should be given formal national and legal recognition, and be known as Nationally Proclaimed Protected Areas (NPPAs).

All NPPAs that have been determined as Category I or II protected areas are to have the status of "National Parks", and are to be entitled to such appellation, regardless of their management authority.

It is envisaged that most, if not all, existing wilderness areas, listed as Category I(b) by the International Union for the Conservation of Nature and Natural Resources (IUCN) international list of protected area categories (IUCN 1994), and possibly some candidate areas will qualify for NPPA status (Bainbridge 2001b).

This is potentially of utmost importance for entrenchment of the national wilderness system.

Other Challenges

Possibly the most important challenge to wilderness enthusiasts is to generate public awareness, support, and resources for wilderness conservation in the new SA. It is unfortunately a reality in this country that:

- The wilderness concept is hardly, or not at all, understood or appreciated by the ordinary SA or villager or person in the street;
- Obtaining the support of the people, or more significantly, that of our leaders for the concept, is at least as important (possibly more important) than legal protection for the long-term survival of wilderness conservation in this country; and
- The alarming and rapid decline in national and provincial government budgets for nature conservation activities poses significant challenges, not the least of which is possible loss of “institutional memory” and skills at staff level.

Responsibility for the necessary action to remedy this situation lies with both the official nature conservation agencies, as well as with wilderness-oriented nongovernmental organization (NGO) movements. It is possible that neither are currently sufficiently active to meet the very large challenge that lies ahead. Much of the wilderness initiatives that have been put in place have their origins in the NGO movements. This is to some extent understandable in that wilderness conservation does not feature prominently on the national priority list, and the official agencies have experienced

[South Africa] is recognized as one of the three most biologically diverse countries worldwide, characterized by seven biomes and nearly 70 distinct vegetation types.

enormous pressures since the introduction of democratic government. To those of us who are committed to the cause, there is no question in our minds that it is in the public interest that not only should the present wilderness system be retained in its entirety but, if possible, should be expanded to include the most important candidate areas. There is reason to believe that a significant number of traditional leaders and politicians are supportive of this, but far greater effort is needed to nurture this support and to meaningfully expand the support base.

It is also important that the wilderness concept be interpreted in local idiom (wilderness in an African context) in order that Africans themselves

may understand and appreciate its values in ethnic and cultural terms.

Finally, the role of the NGO movement within SA and internationally cannot be overemphasized. As public agency budgets decline, greater response from other sectors is required, and financial assistance for public awareness, training, and education of current and future wilderness leaders is imperative. Important initiatives are currently underway, such as the partnership that has been developed between the University of Montana of the United States of America and the University of Natal of South Africa on development of the Protected Area Management Programme, which will involve postgraduate studies, research, and exchange programmes. A component



Aerial view of the portal to the candidate marine and lake wildernesses in the Greater St. Lucia Wetland Park World Heritage Site, new Cape Vidal. Photo by William R. Bainbridge.



Nile crocodile (*Crocodylus niloticus*) in the Lake St. Lucia wilderness, Greater St. Lucia Wetland Park World Heritage Site. The lake and associated wetlands hold one of the largest populations of this species in southern Africa. Photo by William R. Bainbridge.

of this is professional training in wilderness conservation undertaken by the University of Natal, the Wilderness Action Group, and the United States Forest Service. The WILD Foundation is collaborating with the Wilderness Foundation and others to fund and implement the 7th World Wilderness Congress in South Africa. The benefit of these partnerships will be felt not only in the status and sustainability of wilderness in SA but will spread throughout Africa. This is evident in the Wilderness Management Training course conducted for the first time prior to the 7th World Wilderness Congress, in which 10 African nations will participate (also for the first time) with participants from other countries.

Conclusion

The national wilderness system of SA is a priceless natural heritage of which its citizens, the government, and official nature conservation agencies may be justly proud. Although relatively restricted in relation to the extent of the remainder of the national PA system, the wilderness areas conserve vitally important watersheds, biodiversity resources of both national and international importance, and sacred space. They are the only areas of public land in which true wilderness experience is available, on foot and without the filtering effect of mechanical transport. The system has already acquired an international

The national wilderness system of SA is a priceless natural heritage of which its citizens, the government, and official nature conservation agencies may be justly proud.

reputation because it includes the first wildernesses on the African continent to be afforded formal protection, but also because of the high standards to which they have been managed and the unique resources they protect, some of which are of outstanding universal value.

Considerable attention will be necessary in the future from both official agencies and NGOs to ensure that the system receives the most secure and effective legal protection in the new dispensation under consideration for the national PA system, and that the high standards of management afforded the system in the past are maintained. 🐊

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REFERENCES

- Bainbridge, W. R. 2001a. Mountain wilderness in South Africa. *IJW* 7 (2): 30–34.
- Bainbridge, W. R. 2001b. An Update of the Status and Prospects of Wilderness Areas in South Africa. In V. Martin, ed., *Wilderness and Humanity: The Global Issue*, proceedings of the 6th World Wilderness Congress Golden, Colo.: Fulcrum Publishing.
- DEAT. 2001. *A Bioregional Approach to South Africa's Protected Areas 2001/2002*. Pretoria, South Africa: DEAT. www.environment.gov.za
- IUCN. 1994. *Guidelines for Protected Area Management Categories*. Gland, Switzerland: IUCN Commission on National Parks and Protected Areas.
- KwaZulu-Natal Nature Conservation Management Act, 1997. Provincial Gazette of KwaZulu-Natal, pp 2015–2029.
- National Forests Act, No. 84 of 1998. Republic of SA Government Gazette.
- National Parks Act, No. 57 of 1976. Republic of SA Government Gazette.
- Pringle, J. 1982. *The Conservationists and the Killers*. Cape Town, South Africa: T.V. Bulpin.
- White Paper on Conservation and Sustainable Use of South Africa's Biological Diversity*. 1997. Government Notice 1095 of 1997. Government of the Republic of South Africa.

Announcements and Wilderness Calendar

Nikita Lopoukhine Named Head of Parks Canada

Following a national competition, Nikita (Nik) Lopoukhine has been named director-general of National Parks Canada. Lopoukhine has a forestry degree from Syracuse University and a master's degree in plant ecology from the University of Saskatchewan. Lopoukhine has been with Parks Canada since 1981. He has served as a senior science advisor in ecology and has led initiatives, such as the introduction of the current Fire Management Policy. His most recent position was executive director of the Ecological Integrity Panel in the National Parks Directorate, where he led efforts to implement the recommendations of the Ecological Integrity Panel and the federal government strategy for species at risk. He has served as the executive of the International Society for Ecological Restoration and is currently a member of the International Union for the Conservation of Nature and Natural Resources (IUCN) World Commission on Protected Areas and director on the Canadian Council for Ecological Areas.

Ocean Conservancy Kicks off Ocean Wilderness Campaign

On June 19 The Ocean Conservancy (TOC) launched the Ocean Wilderness

Challenge, a bold new initiative aimed at protecting five U.S. sites and one Caribbean site as ocean wilderness. These sites include areas in Glacier Bay and Prince William Sound in Alaska; the Northwestern Hawaiian Islands; the Channel Islands off the southern California coast; Florida's Dry Tortugas; and the San Andrés Archipelago off the coasts of Nicaragua and Honduras. TOC will work closely with local and national partners to achieve their conservation goals. **For more information visit The Ocean Conservancy website at: www.oceanconservancy.org.**

Bosworth Named Chief of U.S. Forest Service

In a move that drew tentative approval from both environmental groups and the timber industry, U.S. Agriculture Secretary Ann Veneman named Dale Bosworth to head the U.S. Forest Service (USFS). A longtime USFS employee, Bosworth has been regional forester since 1997 for the agency's Northern Region, which covers 25 million acres in 12 national forests in Idaho, Montana, and the Dakotas. Mike Dombeck, USFS chief under former president Clinton, praised Bosworth, noting that he was a key architect of Clinton's plan to ban road building and logging on 58.5 million acres of national forest land. The Bush administration has sent strong signals that it would like to

roll back the plan, and industry folks will now be watching Bosworth to see whether he fights for it or recommends that it be diminished. On June 7 Bosworth issued interim protections for roadless areas by requiring his approval of any proposed road building and timber harvesting in these areas. On July 6 he opened a 60-day comment period aimed at revisions that will provide more say for local communities in the roadless designation process. **For more on Chief Bosworth and the roadless rule, visit the U.S. Forest Service Roadless website at: www.roadless.fs.fed.us.**

Judge's Ruling Favors No Wilderness Roads

A judge has ruled against three Utah counties that sought to block the federal government from establishing wilderness protections across millions of acres of public land by claiming unpaved trails were county roads. On June 25th, U.S. District Judge Tena Campbell ruled in favor of the Southern Utah Wilderness Alliance and the Sierra Club in their suit to stop the counties from using heavy equipment to grade new roads through federal lands. The decision is a significant setback for off-road-vehicle groups and others seeking to block wilderness designation of federal lands. In California, four-wheel-drive groups are claiming a right-of-way for Black Sands Beach under the same 1866

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

law used in the Utah case. The unresolved fight over recreational rights began when the federal government closed the beach just north of Shelter Cove to motor traffic in 1999. Because the Utah case is in a different judicial circuit, it doesn't serve as precedent for the California dispute. **Source: Wilderness Information Network, www.wilderness.net.**

Bush Fails to Defend Roadless Rule

The roadless rule for national forest lands is still alive, but caught in a legal and bureaucratic labyrinth. On July 9 the Bush administration missed the deadline to appeal a decision by U.S. District Court Judge Edward Lodge. The Idaho judge blocked the roadless rule with a preliminary injunction in May, citing "grossly inadequate" public comment. The rule, which would protect 58.5 million acres of federal forests from road building, was established by the Clinton administration after 600 public meetings and 1.6 million public comments. The environmental law firm Earthjustice, which intervened in the case on behalf of several environmental groups, will pursue an appeal of Lodge's decision. The rule is also the subject of seven other lawsuits, now in various stages at district courts around the country. The Bush administration has also reopened the comment period, indicating a shift away from national-level roadless protection. The July 10 *Federal Register* announcement states that it is "difficult, and perhaps infeasible to collect in a short time frame" the local information needed for a national roadless rule. Any changes to the rule or its supporting environmental impact statement are likely to bring on further lawsuits from environmentalists. Forest Service Chief Dale Bosworth is currently requiring his personal approval of any road building or timber harvest in roadless areas. **For more information see**

chief's letter at: www.roadless.fs.fed.us/documents/1230_Roadless_Ltr.htm. Source: *High Country News* (www.hcn.org).

Norton Snubs Grizzlies

On June 20 Interior Secretary Gale Norton set aside a Clinton-era plan to reintroduce grizzly bears to the 3.7-million-acre Selway-Bitterroot Wilderness of central Idaho and western Montana. The landmark plan was the first major wildlife recovery plan to propose giving local citizens a direct voice in managing the recovery effort. Under the plan, a Citizen Management Committee composed of 12 members nominated by the governors of Idaho and Montana, as well as one member each from the Nez Perce Tribe, the Fish and Wildlife Service, and the U.S. Forest Service, would oversee the reintroduction of 25 grizzly bears over five years. In scuttling the plan, Norton argued that reintroduction is not popular in the West, "and building support from state leaders is an important element to any potential partnership of this size and scope." Norton's proposal supports the position of Idaho Governor Dirk Kempthorne, a Republican who sued to stop the plan two days before President Bush took office last January. "Massive, flesh-eating carnivores," Kempthorne says, have no place in his state. Conservationists, who worked for six years with timber-industry officials to write the reintroduction plan previously in place, promise to fight back. **Source: *High Country News* (www.hcn.org).**

New Publication Outlines the State of Wilderness in New Zealand

The State of Wilderness in New Zealand, edited by G. Cessford, is now available through the New Zealand Department of Conservation. A compendium based

on a series of articles recently published in *IJW*, the work includes several papers describing the development of the wilderness idea in New Zealand. **For more information contact: DOC Science Publishing, Science & Technical Centre, Department of Conservation, P.O. Box 10420, Wellington, New Zealand. E-mail: science.publications@doc.govt.nz. Website: www.wgnhoiis2/cons/scires/scires.**

Richard Bangs Named New Outward Bound USA, President

Outward Bound USA has selected international explorer, entrepreneur, Internet pioneer, and award-winning author Richard Bangs for its new president. Bangs is currently editor-at-large, spokesperson, and strategist for Expedia Inc., which operates Expedia.com, a leading online travel service. After several years as a river guide on the Colorado River through the Grand Canyon, Bangs founded SOBEK Expeditions at the age of 22. Over the next two decades he led first descents of 35 rivers around the world. Bangs created and produced the first adventure travel CD ROMs, launched the first adventure travel website, and was a pioneer in the concept of virtual expeditions. In 1996 he joined Microsoft to create and run *Mungo Park*, a groundbreaking online magazine that organizes expeditions in real time via the Internet.

New Zambia Wilderness

The Zambia Wildlife Authority (ZWA) is implementing the 1999 revised General Management Plan for the Kafue National Park in Southwest Zambia. The product of three years of expert consultation between ZWA (formerly

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Bureau of Land Management Primitive Skills Team Wins First Corrigan Wilderness Stewardship Award

Bureau of Land Management's (BLM's) California Desert Primitive Skills Team (PST) is winner of the first Keith Corrigan Wilderness Stewardship Award. The team includes **Paul Brink**, **Chris Rollholt**, **Katie Wash**, and **Dave Wash** from the Bureau of Land Management and **Maria Bromley** from the Student Conservation Association (SCA). The Corrigan Award, named for longtime BLM national wilderness coordinator, honors professional or citizen contributions to wilderness stewardship and is administered by the *IJW*.

The team, based in the Ridgecrest California Field Office, completes wilderness restoration work throughout the California desert, often camping in the desert for several weeks or months. The PST developed a creative funding strategy, securing money from three sources: the California Off Road Vehicle Commission, the SCA, and the BLM. The funds were used to hire and support two teams, a college crew and a high school crew.

In 2001 through August, the team had closed and rehabilitated more than 85 former vehicle routes in seven desert wilderness areas, removing visible berms, scattering rocks and woody vegetation along the route, and scalloping the surface to create seed-beds for vegetation establishment. When needed, barriers were constructed or signs installed. A monitor-

ing record is a part of each project, and each disturbance is mapped (both topographic and GPS) and photographed before and after. In the future the BLM will check each project for new trespass and the establishment of native vegetation on the restored area. The work is already a major success in restoring wilderness to a more natural appearance and stopping current off-road-vehicle trespass.

In addition to the fieldwork, the team has been telling the public about wilderness and restoration in public talks, articles, books, and slide shows in southern California (see *IJW* vol. 7, no. 1, 2001, p.30).

The team reports several lessons learned in the course of this work:

1. Natural restoration starts quickly after rehabilitation when off-road-vehicle trespass stops.
2. Primitive tools and methods are cost effective, and they work.
3. The project success, the partnership, and the enthusiasm of the participating youth has had a major positive impact on everyone involved or having contact with them.
4. The rapid accomplishments of the PST indicate that BLM's planned restoration work in the California desert can be completed in five years, not the 20 years that were originally anticipated.



The PST in the California desert. Photo courtesy of BLM.

5. BLM's California Desert PST has created a simple, practical restoration approach that brings many positive benefits to the wilderness and the people involved.

Especially important, the young SCA members of the PST are learning vital lessons about wilderness resource management and public land agencies. Some of them will use this experience as a foundation for resource management careers, or in other ways will continue to contribute to stewardship of wilderness and natural resources in the future.

Keith Corrigan was deeply involved in shaping the designation of wilderness in the California Desert. The work of the primitive skills team is a logical step in fulfilling Keith's vision.

For more information, contact the award-winning team members:

PAUL BRINK, BLM Statewide Wilderness Coordinator, California State Office, 2800 Cottage Way, Sacramento, California 95825, USA. Telephone: (916) 978-4641.

CHRIS ROLHOLT, Wilderness Coordinator, BLM California Desert District, 6221 Box Springs Boulevard, Riverside, California 92507, USA. Telephone: (909) 697-5395.

KATIE WASH and **DAVE WASH**, Primitive Skills Team Coordinators, BLM, Ridgecrest Field Office, 300 South Richmond Road, Ridgecrest, California 93555, USA. Telephone: (760) 384-5400.

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The California desert before and after restoration. Photo courtesy of BLM.



Letters to the Editor

Carhart Wilderness Training Center Announces Policy History Project

Dear *IJW*,

It gives me great pleasure to announce a new project of the Carhart Wilderness Training Center. The project is called Wilderness Stewardship Policies: An Historical Analysis. We are creating an evolutionary history of federal agency wilderness policies starting from The Wilderness Act of 1964 to the present, including policies for all four land management agencies—the Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service. Our goal is to create an archive of agency policy materials and provide a description of their wilderness policy histories.

This letter also serves as a call for documents, reports, testimonies, and other materials that describe wilderness stewardship decisions, discussions, and suggested policy text for any of the agency's decisions pertinent to the revision of their policies or guidance for interpretation of policy.

The Wilderness Act of 1964 was a bold statement of human restraint in the name of protecting wild country. Once enacted, the federal agencies responsible for protecting wilderness

then faced the difficult task of administering designated and proposed areas in accordance with the act. Agency policies have evolved over the years since 1964, but there is no organized record of how and why they changed and which would contribute to an understanding of their evolution. This is essential to provide the context necessary to address today's complex wilderness stewardship questions.

The goal of the Policy History Project is to provide agency wilderness stewards, policymakers, researchers/scientists, and students a clear, historical description of wilderness stewardship policy evolution. This is a history of wilderness administration as opposed to wilderness designation. The primary focus will be on how the language of the act was translated into policy, regulations, and national direction for wilderness stewardship since 1964. Many of the people who were instrumental in translating The Wilderness Act into policy are retiring, and early documents are in danger of being lost. We want to collect, archive, and summarize the agencies' institutional memories and make them accessible to future wilder-

ness stewards before this memory is lost. Oral history interviews will be conducted, and documents will be collected and stored in a searchable database. A summary of the evolution of federal wilderness management policies will then be written.

We have already collected over 200 documents, and the number continues to grow. In order to minimize duplication, we have established a list of already collected documents on our website, www.wilderness.net/carhart/policy. Before sending a document to us, please check to see if we already have it. Thank you for helping us with this exciting project. If you have questions or suggestions, please don't hesitate to call or e-mail us, and send documents to the address below.

Sincerely,

Connie G. Myers, Director

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Book Reviews

Outdoor Behavioral Healthcare: Definitions, Common Practice, Expected Outcomes, and a Nationwide Survey of Programs

By Keith C. Russell and John C. Hendee. 2000. Technical Report # 26. Idaho Forest, Wildlife, and Range Experiment Station, Moscow, Idaho. 87 pp., free, (paperback).

The stated goal of this technical report from the University of Idaho Wilderness Research Center and its Outdoor Behavioral Healthcare (OBH) Research Cooperative is to “improve understanding about outdoor behavioral healthcare” for a variety of affected groups including parents, insurance companies, land managers, and social service agencies. The report does just that. It also reviews the history, philosophy, and methods employed in the OBH industry and outlines the 86 programs (of 116) that responded to a nationwide survey.

Part one of the report discusses the philosophy and evolution of OBH industry from wilderness therapy to outdoor treatment programs, describes the various program models now being used, and reviews the literature in the field. Conditions of change in counseling and therapeutic elements of group therapy are presented, along with a detailed explanation of the processes used in OBH treatment. The material includes an excellent review of literature related to therapeutic outdoor program outcomes such as self-concept, social skills, substance abuse, and recidivism.

Part two of the report is a descriptive presentation of the authors’ study of 86 OBH programs, including private and public programs for adjudicated youth. The study data include information on program models, program organization and sponsorship, treatment cost, client characteristics, licensing, insurance reimbursement, and a variety of other topics of interest to outdoor professionals and lay audiences.

Russell and Hendee are on the forefront of therapeutic outdoor programming today, and they understand the need to demonstrate the credibility of such programs with objective data about outcomes, economic viability, insurance reimbursement, and client profiles. It is easy to read and comprehend, with tables and figures supplementing the text.

We recommend this volume for undergraduate and graduate students, practicing professionals, and families considering an OBH program for their child. Given the variety of therapeutic outdoor programs operating today, it is helpful to have such summary data about this growing industry.

Reviewed by JENNIFER DAVIS-BERMAN and DENE BERMAN, authors of *Wilderness Therapy: Foundations, Theory and Research*.

Phantom Parks: The Struggle to Save Canada’s National Parks

By Rick Searle. 2000. Key Porter Books, Toronto. 288 pp., \$19.95 CAD (paperback).

In a sense, *Phantom Parks* is the Canadian equivalent to Joseph Sax’s *Mountains Without Handrails*. Like his American counterpart, Rick Searle provides an intimate indictment of his country’s (mis)management of the national parks, using a nontechnical writing style to convince the public that major changes are required for Canadian parks to remain ecologically intact for future generations.

Searle paints a far bleaker picture of Parks Canada, the Canadian national parks agency, than does William Lowry in *The Capacity for Wonder*, who suggested that Parks Canada was more effective and less politically influenced than the U.S. National Park Service. This may still be true, but Searle successfully depicts Parks Canada as an agency in chaos: staff have been decimated by budget cuts, fractured by the new “entrepreneurial approach” to park management, and disillusioned by constant shuffling of the agency between various government departments.

Perhaps the most critical issue noted in *Phantom Parks* is the continuing chasm between the legislated mandate and managerial actions of Parks Canada. Like most other park agencies, Parks Canada has long struggled with the dual mandate of “preservation versus use” embedded in early

park legislation. However, in 1988 changes were made to the National Park Act that seemed to create a clear, singular mandate: "Maintenance of ecological integrity through the protection of natural resources shall be the first priority when considering park zoning and visitor use in a management plan." Current park policy notes that, "In every application of policy, this guiding principle [ecological integrity] is paramount" (p. 30).

As Searle demonstrates, while Parks Canada "talks the talk," they do not "walk the walk": ecological integrity still plays second fiddle to recreation and tourism development. To some extent, the rise of right-wing economic policies, which slashed government spending and emphasized revenue generation, have blocked agency efforts to address ecological integrity. However, Searle suggests that even if these forces had not become dominant, national parks would still be endangered. He notes, for example, that most senior staff still embrace the dual mandate or the "parks are for people" (use) philosophy. Moreover, fewer than 2% of Parks Canada's 3,000 employees have graduate degrees, which makes it difficult, if not impossible, to manage for ecological integrity, even if ecologists could agree upon what ecological integrity is and how (or if) we should manage (i.e., control) it. Nor does Parks Canada have enough ecological knowledge or data to determine the state of ecological integrity of one park, let alone the whole park system.

Finally, Searle notes that the Canadian public is unaware of the dangers facing its cherished national parks and Parks Canada's inability/unwillingness to meet its new legislated mandate. Searle suggests we must change society's perceptions of national parks, "which are dominated by three major

metaphors: parks as preserves, parks as playgrounds or parks as profit producers. Each of these metaphors is the source of serious problems for maintaining and restoring wildness in the national parks" (p. 185). As many other authors have noted, Searle believes a change from anthropocentric to biocentric societal values is required to overturn these metaphors.

Phantom Parks is the latest of a remarkable series of works that are highly critical of Parks Canada: the *Auditor General's Report* (1996), *Banff-Bow Valley Task Force Study* (1996), *1997 State of the Parks Report* (1998), and agency-sponsored *Report of the Panel on the Ecological Integrity of Canada's National Parks* (2000) all highlight the failings of Parks Canada in considerable and painful detail. While these failings are serious, it bodes well that these criticisms are entering the public domain and that the current minister is courageous enough to open Parks Canada to such scrutiny.

Of all these publications, Rick Searle's provides the most personal and impassioned account of the issues facing Parks Canada. Hopefully, the geographical and philosophical travels through the national park system portrayed in *Phantom Parks* will succeed in their objective: to raise the ire of the Canadian public and thus force the federal government to address the crisis in the national parks and Parks Canada.

While most appropriate for Canadian readers, this book will be of interest to park and wilderness managers everywhere, for almost every protected area system is being bombarded by the same ecological, economic, and political pressures that are facing Canadian national parks. Its damning observations will ring true, I fear, in most contemporary park and wilderness agencies.

Reviewed by JOHN SHULTIS, *IJW* book review editor. E-mail: shultis@unbc.ca.

Restoring Nature: Perspectives from the Social Sciences and Humanities

Edited by Paul H. Gobster and R. Bruce Hull. 2000. Island Press, Washington, D.C. and Covelo, California. 269 pp., \$25.00 (paperback).

To restore or not to restore: that is the question posed in Gobster and Hull's book. In Shakespeare's time, the question would never have been asked, as Western culture was almost completely fixated on destroying the wild. While one might argue that this is still the majority position today, a growing number of people wish to begin "restoring" or "re-wilding" some of these tamed landscapes: that is, returning them to some previous, healthier ecological condition (e.g., before Europeans entered the New World). *Restoring Nature* scrutinizes the pros and cons of restoration from the perspective of the social sciences and humanities. The book adopts a postmodern, constructivist position in that "nature" and "wilderness" are considered to be cultural constructs imbued with different meanings and values to various groups of people, each of which is equally meaningful and appropriate. The debate on whether to restore landscapes, the authors argue, is essentially a social rather than biological issue. At the heart of the matter is the age-old question of whether humans are "a part of" or "apart from" nature.

Proponents of restoration suggest that the natural area (re)created by restoration—called "landscapes of ambivalence" (p. 24) by one author because they are neither strictly natural nor artificial—not only helps conserve nature and ecological processes, but perhaps more importantly creates a sense of community between humans and nature, or even forms a new type of de-

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