Wild EARTH

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History and Opportunity

American Parks and Protected Areas

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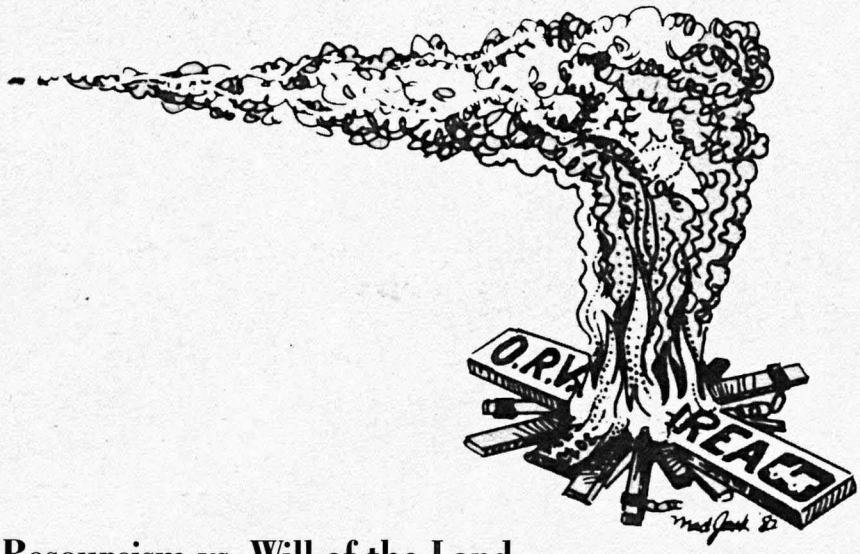
Around the Campfire

by Dave Foreman



Resourcism vs. Will of the Land

IN 1987, THEN-PRESIDENT OF THE WILDERNESS SOCIETY GEORGE FRAMPTON wrote, "It may come as something of a shock to our current generation of committed environmentalists to discover that the modern conservation movement sprang from a highly developed philosophy of *intensive use,* that is, exploitation, of our natural resources."[1] In all due respect, I think Frampton's map is thuddingly wrong. The modern wilderness conservation movement sprang from no such thing.

The early rally against landscalping split in the 1890s, a victim of unbridgeable visions of Nature. The two movements that came out of the split were both backlashes to landscalping, and both were centered on the public lands and wildlife. They were, however, far different in how they saw the future of the public lands and the value of the other species that lived throughout the United States. These reactions were Conservation (represented now by private groups like the Sierra Club and the New Mexico Wilderness Alliance) and Resourcism (represented now by government agencies like the United States Forest Service and state game and fish agencies). They have deeply opposed views about self-willed land.

Words have power, and I believe it is important to carefully name things. Both these movements have claimed the conservation label and this leads to considerable confusion. What do we call these two conservation movements? Resource Conservation vs. Nature Conservation? Conservation vs. Preservation? Gifford Pinchot claimed he invented the word "conservation" and used it to describe his "wise use" of natural resources. He disparagingly referred to John Muir and others as "preservationists." However, through the twentieth century the word "conservation" has become more and more attached to the so-called preservationists. Neil Evernden at Ontario's York University described the resource conservation ideology as "resourcism" in 1985, writing, "Resourcism is a kind of modern religion which casts all of creation into categories of utility."[2] In *The Idea of Wilderness,* philosopher

continues on page 2

The opinions expressed in Campfire are my own, and do not necessarily reflect official policy of The Wildlands Project or *Wild Earth.* —*DF*

About Wild Earth *and The Wildlands Project*

Wild Earth and The Wildlands Project are closely allied but independent nonprofit organizations dedicated to the restoration and protection of wilderness and biodiversity. We share a vision of an ecologically healthy North America—with adequate habitat for all native species, containing vibrant natural and human communities.

Through the quarterly journal *Wild Earth*, other publications, and advocacy, **Wild Earth** works to foster a culture of conservation, helping to communicate and shape the latest thinking in conservation science, philosophy, politics, and activism.

■ We make the teachings of conservation biology accessible to non-scientists, that citizen advocates may employ them in defense of biodiversity. ■ We provide a forum for dialogue within the conservation movement on the scientific, strategic, and spiritual foundations of effective conservation action. ■ We highlight the campaigns of biodiversity preservation groups and coalitions across North America, and serve as a networking tool for wilderness activists. ■ We serve as the publishing wing of The Wildlands Project. ■ We expose threats to habitat and wildlife, and regularly explore the links between human population growth and biodiversity loss. ■ We defend wilderness both as ***idea*** and as ***place.***

The Wildlands Project is the organization guiding the design of a continental wilderness recovery strategy. Through advocacy, education, scientific consultation, and cooperation with many regional groups, The Wildlands Project is working to design and implement systems of protected natural areas—wildlands networks—across the continent.

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cover art
"The Grand Cañon of the Yellowstone," 1872, oil on canvas by Thomas Moran. Background: Map of Yellowstone National Park from Hayden survey data, 1871.

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Around the Campfire *continued*

Max Oelschlaeger makes a strong case that "resourcism" is a better term than "conservation" to describe Pinchot and his successors.[3] Thus, I call Resource Conservation "resourcism" and Nature Conservation "conservation."

Humanism is the secular religion of the modern (and postmodern) world. In his no-blinders-on book, *The Arrogance of Humanism*, ecologist David Ehrenfeld defines humanism as "a supreme faith in human reason—its ability to confront and solve the many problems that humans face."[4] Humanism makes Man the measure of all things, the vessel of all values. Humanism is engineering—of machines, society, individuals, and Nature. Resourcism is Humanism directed at Nature (or "natural resources," in the jargon of Resourcism).

The Resource Elite

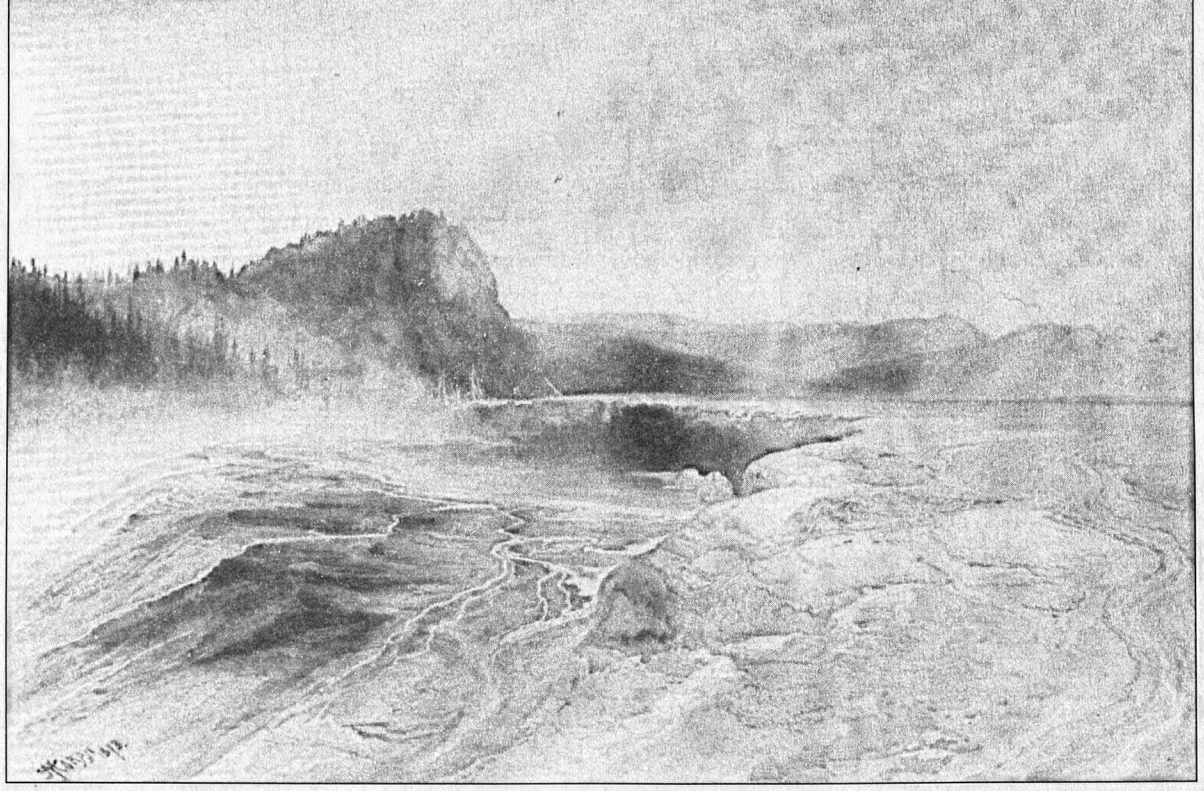
Conservation and the Gospel of Efficiency: The Progressive Conservation Movement 1890–1920 by historian Samuel P. Hays is the best source for understanding the origins and ideology of what he calls the Progressive Conservation Movement and what I call Resourcism. Hays writes, "Its essence was rational planning to promote efficient development and use of all natural resources. The idea of efficiency drew these federal scientists from one resource task to another, from specific programs to comprehensive concepts."

Hays shows how these resource scientists in Theodore Roosevelt's administration believed that emerging science and technology were opening up "unlimited opportunities for human achievement" and thus they were filled "with intense optimism." While they worried some about possible resource shortages in the future, "They emphasized expansion, not retrenchment; possibilities, not limitations." These professional men who claimed the mantle of conservation did not believe in the preservation of the land. "In fact, they bitterly opposed those who sought to withdraw resources from commercial development."[5]

So much for a single conservation movement fighting the myth of superabundance, so much for a sense of humility before the workings of Nature, so much for allowing some land to have its own will. From 1900 on there was a deep chasm between resourcism and conservation. All these two movements really shared was opposition to landscalping and support for public lands.

A professional, scientific resource manager elite was deep rooted in the resourcism movement. Hays says that this elite believed, "Conflicts between competing resource user...should not be dealt with" by the political process, but rather by professional resource managers coolly making "rational and scientific decisions." They had a vision of a school of resource management "guided by the ideal of efficiency and dominated by technicians."[6]

The resource managers' emphasis was oriented toward a reductionist, engineering version of science—how to manipulate Nature. In his illuminating book on the history of natural science, *Nature's Economy: A History of Ecological Ideas*, Donald Worster sees "two ways of reasoning, two moral allegiances." One is "Arcadian" science, which tries to understand the world around us; the other is "imperialist" science, which is the "drive for the domination of nature."[7] Resourcism was and is solidly in the imperialist tradition.



Hays writes that the early resource elite "maintained close contact with the four major engineering societies"—Civil, Mechanical, Electrical, and Mining.[8] Indeed, the resource managers formed their own professional societies, modeled after those of the engineers. The Society of American Foresters and the Society for Range Management were and are professional associations more for engineers than for scientists. Even the Wildlife Society is torn between wildlife biologists and wildlife engineers.

Gifford Pinchot and the other resource engineers sought not only professionalism in managing "resources," but also a new social order, "based on cooperation instead of monopoly, on sharing instead of grasping, and that mutual helpfulness will replace the law of the jungle."[9] Note that phrase "law of the jungle," which shows the loathing held by the resourcists for self-willed land. Aldo Leopold biographer Curt Meine explains Pinchot's attitude: "Nature unmanaged was rule by unbridled red-in-tooth-and-claw competition. It was a world, in the end, of constant struggle for existence, a wild world that should and would be civilized through the application of human managerial skill."[10] In other words, resourcism could tame landscalping, but the goal would still be the same: to squeeze as much wealth out of the land as possible. To tame the land.

Pinchot offered a new Platonic vision of society. Instead of a philosopher king, he proposed an engineer king.

Although Pinchot's resource managers were foes of the National Parks and sneered at the "preservationist" sentiment behind them, the early leaders of the National Park Service, Stephen Mather and Horace Albright, believed in maximizing the public recreational use of these "public pleasuring grounds." Under their leadership, roads and grand hotels became hallmarks of the National Parks. Later leaders of the Park Service also pushed for development, turning their eyes from the damage it did to the land. National Park Service historian Richard Sellars has clearly shown that the NPS was a "multiple-use" agency from the start.[11] National Park management was dominated by engineers, just as were the other resource agencies. Before establishment of the National Park Service in 1916, government advocates were calling for engineers to run the agency.[12] The first director of the NPS, Steven Mather, hired engineers as superintendents for many of the early parks.[13] Sellars's recent book, *Preserving Nature in the National Parks: A History,* is the most important work for understanding the Park Service, and shows how the NPS has been dominated by engineers, landscape architects, foresters, and (recently) law enforcement officers, not by scientists or naturalists. Sellars explains that "national park management with its emphasis on tourism and use has largely reflected the values and assumptions of the Service's utilitarian-minded leadership culture."[14] This leadership has almost always opposed the preservation of self-willed Nature in the parks and has scorned science. "Nature goes to extremes if left alone," was the comment of a leading NPS forester in 1935.[15]

By no means was the ideology of resourcism restricted to North America. It has been a key element of modernism around the world. In 1905, Sir Charles Eliot, Commissioner of the East Africa Protectorate (British Empire), wrote, "Marshes must be

"Giant Blue Spring, Yellowstone," 1873, by Thomas Moran

drained, forests skillfully thinned, rivers be taught to run in ordered course and not to afflict the land with drought or flood at their caprice; a way must be made across deserts and jungles, war must be waged against fevers and other diseases whose physical causes are now mostly known." Historian John MacKenzie comments, "It is a fascinating statement....He applies the language of discipline and training to nature in the same way in which it was invariably used of indigenous peoples. Natural forces, like people, were to be acculturated to the modern world."[16] The will of the engineer had to replace the will of the land. This is the same idea being applied today, albeit in politically correct and anticolonialist language, by the social and land engineers of "sustainable development."

The Ideology of Resourcism

The ideology of resourcism has had a number of interlocking pieces throughout the twentieth century. I would carve them up as follows:

1) Professionalism. Trained experts are best qualified to manage natural resources and public lands.

2) Progressivism/Optimism. Progress as a secular religion of material, informational, moral, and organizational advances is key to resourcism, as is an intensely optimistic view of the future benefits of wise management.[17]

3) Engineering. The science behind resourcism is manipulative and controlling—not pure science, but rather technology and engineering.

4) Resources for people. Resource management is to be done democratically with benefits for everyone.

5) Multiple Use. Properly managed public lands can produce multiple uses of timber, minerals, forage, water, wildlife, and recreation, often on the same acre.

6) Sustained Yield. Lands are to be managed for the maximum they can produce on a sustained basis without harming the future productivity of the land.

7) Utilitarianism. Resources and the land are here to be used to produce goods and services for humans.

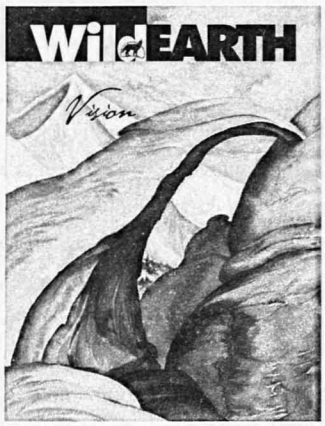
An illustrative statement of this dogma came from the president of the American Society of Civil Engineers in 1908 when he told an engineering convention a story about Lord Kelvin. The great physicist had been asked how the natural beauty of Niagara Falls would be harmed by water power development. "His reply was that of a true engineer: 'What has that got to do with it? I consider it almost an international crime that so much energy has been allowed to go to waste.'"[18] In a pamphlet prepared for the Bicentennial of the United States Constitution, the Bureau of Land Management expressed the same sentiment in a less bombastic way: "Your lands are not idle lands. They are bountiful as well as beautiful. Each year, they produce a steady stream of goods and products that enrich the lives of all Americans."[19] In other words, self-willed land is idle. The human will of resource management will stand it at attention and get it working. Pinchot said it most succinctly when he wrote, "Forestry is Tree Farming."[20] No room there for self-willed land. No room, indeed, for anything but the Will of Man.[21]

—DAVE FOREMAN
Desolation Canyon

Adapted from my book-still-in-progress (and nearly done), The War on Nature.

NOTES

1. Frampton, George T., Jr., "Introduction," in Pinchot, Gifford, *Breaking New Ground* (Island Press, Washington, DC, 1987), p. xi. Frampton later became President Clinton's Assistant Secretary of the Interior and then head of the Council on Environmental Quality.
2. Evernden, Neil, *The Natural Alien: Humankind and Environment* (University of Toronto Press, 1985), p. 23.
3. Oelschlaeger, Max, *The Idea of Wilderness* (Yale University Press, New Haven, CT, 1991), pp. 281–289.
4. Ehrenfeld, David, *The Arrogance of Humanism* (Oxford University Press, New York, 1981), p. 5.
5. Hays, Samuel P., *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement 1890–1920* (Atheneum, New York, 1979 [1959]), p. 2.
6. *Ibid.*, p. 3.
7. Worster, Donald, *Nature's Economy: A History of Ecological Ideas* (Cambridge University Press, New York, 1992), p. xi.
8. *Conservation and the Gospel of Efficiency,* p. 123.
9. Pinchot, Gifford, *Breaking New Ground* (Island Press, Washington, DC, 1987 [1947]), p. 509.
10. Meine, Curt D., "The Oldest Task in Human History," in Knight, Richard L. and Sarah F. Bates, eds. *A New Century for Natural Resources Management* (Island Press, Washington, DC, 1994), p. 23.
11. Sellars, Richard West, *Preserving Nature in the National Parks: A History* (Yale University Press, New Haven, CT, 1997), p. 205.
12. *Ibid.*, p. 34.
13. *Ibid.*, p. 55.
14. *Ibid.*, p. 285.
15. *Ibid.*, p. 129.
16. MacKenzie, John M., "Empire and the ecological apocalypse: the historiography of the imperial environment," in Griffiths, Tom and Libby Robin, eds., *Ecology and Empire: Environmental History of Settler Societies* (Melbourne University Press, 1997), p. 217.
17. For the influence of optimism, see Hirt, Paul W., *A Conspiracy of Optimism: Management of the National Forests since World War Two* (University of Nebraska Press, Lincoln, 1994).
18. *Conservation and the Gospel of Efficiency,* p. 127.
19. "Public Lands, USA: The Story of America's Public Lands," GPO: 1987 0 173-639.
20. *Breaking New Ground,* p. 31.
21. This notion that wild land is idle land comes through today in the political blather about "working forests" in New England. Ecologist Steve Trombulak of Middlebury College in Vermont demolished this idle lands myth in "Wild Forests ARE Working Forests: Some Thoughts on the Language of Despoilment," *Wild Earth* Fall 1998, pp. 73–76.



Congratulations on an excellent issue [winter 1999/2000]. We can never talk enough about the vision thing, if we are going to keep our eyes on the ethical reasons behind what we do day-to-day.

I particularly enjoyed Jamie Sayen's lead article comparing abolitionism and preservationism. As a lifelong activist working now in the political arena, I wholeheartedly agree with his conclusion that more radical abolitionist thinking and action in the preservationist movement might "make the world of politics safe enough to bring forth an ecological Lincoln or two."

Compromise, as Sayen acknowledges, is the lifeblood of politics. It comes from Latin roots that mean "sending something forward together with others." If preservationists were the majority everywhere in this country, politicos like myself would have no problem pushing radical preservationist agendas through the political process. Unfortunately, while the American electorate is disposed towards preservation in concept, they mostly vote into office officials who oppose preservationism and speak instead to voters' real bottom lines: jobs, security, education. The result is that every little step towards even a modicum of preservation is an incredible struggle and consumes vast amounts of political capital.

But both are necessary. Radical abolitionist-style organizing is a good strategy for those in the public arena trying to influence the moral conscience of the nation. Just as compromises that continue to push the envelope of preservation from within the system are good strategies in the political arena. Those complementary actions, done in consort, seem to me to be the best opportunity to achieve the kind of free and wild society that *Wild Earth*'s vision issue speaks to, just as abolitionists in the public arena and Lincoln in the political arena of the 1860s finally achieved the legal end of slavery.

Still, we need some cautionary notes here.

While Garrison's genius may have been his belief that he could never win his cause in the political arena, as Sayen says, he helped incite more than merely "a moral revolution." The War between the States was a terrible civil conflagration that killed hundreds of thousands of people, and laid waste to the land. One would hope that the goal of radical preservationist activity would not be to polarize the civil debate to the point of armed conflict.

The second caution is that neither Garrison nor Lincoln nor even armed conflict achieved real liberty for African-Americans. Most basic human freedoms were denied many blacks in large swaths of this country until the civil rights upheavals of 150 years later. Even today the struggle for equality and justice continues, whether in the political arena of job quotas or the public arena of Confederate flag flying.

All of which is to say that the kind of vision those of us who believe in conservation biology and wildlands activism are working towards should not lead us into battle, nor even the use of the language of war to characterize the struggle. Ours is a moral cause that ought to be carried out in a moral way, pushing as much by visionary example as by social proposal.

And though we may not like to hear it, the campaign to achieve a deep ecology vision for this country and its wildlands will likely take many more generations than just our own. Sayen is right when he says that "sustaining a campaign of moral and ecological education cannot fail." But it's just as important to remember that turning around the course of predatory corporate globalism that began with the industrial revolution won't happen overnight. We ought to be prepared for a long struggle, both public and political.

ART GOODTIMES
San Miguel County Commissioner
Norwood, Colorado

I have just read with interest Dave Foreman's editorial ["The Pleistocene-Holocene Event: Forty Thousand Years of Extinction"] in the winter *Wild Earth*.

If he quoted John Terborgh correctly, please note that there are no placental ungulates native to Australia (a continent according to some). It is also a little strenuous to consider South America as being like other continents (as opposed to being like North America) when its megafauna consists of three closely related species of llamas and two tapirs.

William Stolzenburg's point [that "no biologist has documented the extinction of a continental species of plant or animal caused by non-human agencies..."] is mere allegation and I

was surprised to see Foreman quote it without demurrer. How can it be that non-human agencies have just switched off, after moulding the earth's biota for the last billion years or more? The real point is that everyone simply assumes, without requiring evidence, that all extinctions going on at present must be due to human impacts. Thus departs science.

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I was excited by Andy Kerr's call at the beginning of his article, "Big Wild: A Legislative Vehicle for Conserving and Restoring Wildlands in the United States" [winter 1999/2000], for public land activists "to move from an almost exclusively defensive legislative posture to a primarily offensive posture." Yet by the end of the article I felt like he'd pulled a bait-and-switch, wrapping his proposal in the bold language and political strategies already being applied effectively by the zero cut movement, but leaving out the content. I believe that the shortcomings of his proposal, which calls for the protection of only a *fraction* of our public lands, trace back to Kerr's flawed analysis of the zero cut campaign.

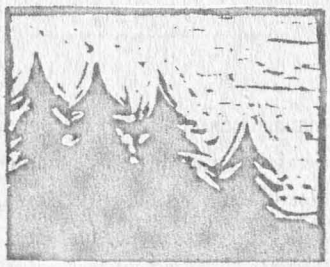
Kerr dismisses zero cut legislation as outside the realm of political reality. But a review of this section of his essay finds his claims backed by spurious evidence. For example, while Kerr acknowledges widespread public support for zero cut, he says that politicians perceive it as "extreme." This claim simply doesn't hold water. The National Forest Protection and Restoration Act is making strong progress in Congress. It currently has 87 cosponsors, including respected environmental leaders like Rep. George Miller (D-CA) as well other lawmakers who are generally not associated with bold environmental protection measures, such as Jim Leach (R-IA). It is also worth noting that in recent months the National Forest Protection and Restoration Act has had a comparable number of cosponsors to the less "extreme" Northern Rockies Ecosystem Protection Act, although NREPA has been around since 1992 and zero cut legislation was only first introduced in 1997 (not 1995 as Kerr states).

The most disturbing element of Kerr's critique of zero cut is his final point. Here he implies that we should not "expend significant political capital…'saving' a huge amount of already clearcut land." (Note the hyperbole which inaccurately and irresponsibly dismisses the vast areas of non-pristine public lands.) This sort of thinking should be unconscionable to conservationists and certainly has no place in a proposal that purports to be bold and visionary. We should never treat any of our public lands as sacrifice areas. At the beginning of his essay, Kerr recounts conservation biology's findings that "at least one-quarter of the continental landscape must be in *very strong* protective categories." Why then is Kerr willing to forsake so much of the best prospective areas for receiving protection and being allowed to recover? We are not so rich in public lands that we can abandon large swaths to further destruction by timber companies.

Now is not the time to be diminishing our goals. A Big Wild campaign simply does not make sense if it does not include full protection for all of our public lands from logging, livestock grazing, mining, and other forms of commercial exploitation. I am grateful to Kerr for stirring the discussion of what a proactive public lands strategy could look like. I can only hope that others will now step forward to articulate the sort of bold, visionary campaign that truly deserves the name Big Wild.

DOUG BEVINGTON
Regional Organizer, John Muir Project
Berkeley, California

A Wilderness View



PARKS AND WILDERNESS
The Ultimate Working Landscape

These great bodies of reserved lands cannot be withdrawn from all occupation and use. They must be made to perform their part in the economy of the Nation.

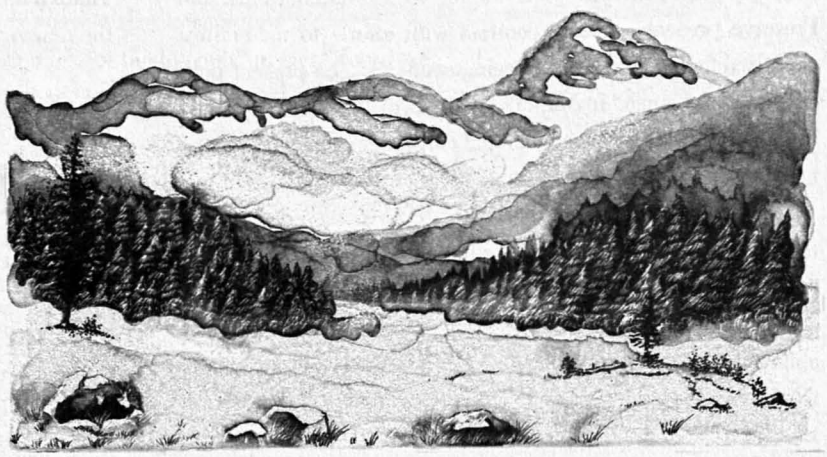
—report of the National Forest Commission, 1897

The object of our forest policy is not to preserve the forests because they are beautiful—or because they are refuges for the wild creatures of the wilderness—but the making of prosperous homes—every other consideration becomes secondary. **—Gifford Pinchot, 1903**

These temple destroyers, devotees of raging commercialism, seem to have a perfect contempt for Nature, and instead of lifting their eyes to the God of the mountains, lift them to the Almighty Dollar. **—John Muir, on the proposal to dam Hetch Hetchy, 1908**

In his book *Wilderness and the American Mind*, historian Roderick Nash recounts the story of John Muir and Gifford Pinchot's falling out in 1897 over livestock grazing in the newly created forest reserves (later to become the national forests). Muir, then the West's leading champion for wild places and president of the Sierra Club (which he had helped found), and Pinchot, who would become the first chief of the US Forest Service, had become friendly while touring the reserves in the summer of 1896. Pinchot and several others served on a commission appointed by the Secretary of the Interior to prepare recommendations on how the forest reserves should be managed.

As the story goes, Pinchot had released a statement to the press approving of sheep grazing in the reserves. Muir, who railed against the damage caused by "hooved locusts," demanded to know if Pinchot had been misquoted. He had not. "Then...I don't want anything more to do with you," retorted Muir. "When we were in the Cascades last summer, you yourself stated that the sheep did a great deal of damage."[1]



While it may be simplistic to find in Muir and Pinchot, respectively, the embodiment of preservationist and resourcist worldviews, it is awfully convenient; and, if Nash, Samuel Hays, and other historians are correct, it may even be largely accurate. From 1896–1916 conservation history records conflicts that portray a growing balkanization among people who cared for the land: the wrangling over

illustration by Cynthia Armstrong

management of the forest reserves and creation of the US Forest Service, the battle over damming the Tuolumne River to flood the Hetch Hetchy Valley, the campaigns to designate new national parks and monuments, and create the National Park Service.

In these and other watershed moments, we can chart the cleft between utilitarian conservation and Nature preservation, or, in Dave Foreman's preferred lexicon, between the engineers of efficient "resource" use and advocates for self-willed land.[2] Arguably, this tension is the oldest, most elemental, and still most vexing problem in American conservation. As we put together this issue of *Wild Earth*, which explores the history, current threats, and future potential of parks and protected lands, it was impossible to avoid.

Divisions between the ideological descendants of Muir and Pinchot remain strong, although the camps are not always entirely distinct. Writing in this issue, James Morton Turner suggests that the early intellectual geography of American environmentalism was decidedly muddy. It remains so today.

What are we to think, for instance, when an archetypal resource conservation group like the Society for the Protection of New Hampshire Forests, which has been closely allied with the timber industry and hostile to wildlands protection, chooses to place a forever wild easement on some of its holdings?[3] Conversely, what should we make of The Nature Conservancy—the world's foremost biodiversity brand name—getting into the ranching business in the West[4] and the logging business in the East?[5] (And in the Far East, even entering a *for-profit* joint partnership to conduct "sustainable" logging in Papua New Guinea, one of the globe's biological hotspots!)[6]

Still, for the most part, the old fault lines between resource conservation and Nature preservation continue to fracture the American conservation movement. Similar schisms can be drawn for land protection agendas throughout North America, but no place offers such a clear example as northern New England, where the proposed Maine Woods National Park and Preserve presents a stark contrast with efforts to maintain a slightly reformed industrial logging economy. The present policy of "resource use" in Maine's great North Woods means maximum profit-taking by transnational corporations, degraded land health, and decline of mill towns. Michael Kellett argues in this *Wild Earth* that a strategy of preservation—centered on a new national park—offers the possibility of renewed ecological and economic vitality for the state's natural and human communities.

Today's new preservationists embrace conservation science and recognize the need for ecologically informed resource extraction on private lands, *but as a complement to, not a substitute for, strictly protected areas*. Opponents of parks and wilderness, however, both within resource industries and resource conservation groups, continue to promote the view that "wise use" equals biodiversity conservation. That large blocks of truly wild lands are impractical or unnecessary. That as long as land is well managed, we can have our logging and farming and ranching everywhere across the landscape—and biodiversity too.

Besides ignoring political reality, the power of markets to encourage land abuse, and human history, such thinking is ecologically ignorant. It rejects the latest thinking in landscape ecology. Moreover, it is ethically repellent—for it reinforces the notion that the natural world is simply a storehouse of goods for human enjoyment and profit. It makes Lord Man the apogee of Creation, and impedes progress toward a time when humanity is but a "plain member and citizen" of the biotic community.[7]

Parks and Wilderness Areas are both tangible and cognitive stepping stones on the path toward Leopold's land ethic: they demonstrate a society's commitment to all members of the land community by providing refuge for shy and sensitive wildlife, and help foster in people an appreciation for the integrity and beauty of self-willed land. An individual walking among the giant Douglas-firs in the Hoh Rainforest of Olympic National Park cannot help but be moved, especially after viewing the brutal clearcuts on corporate, tribal, and national forest lands outside the park. Crossing from Yellowstone National Park into the Targhee National Forest, anyone can see the distinction between preservation and "use" written on the land (albeit highly unwise use in the case of the myriad Forest Service clearcuts).

Protected areas work. No, they cannot alone sustain biodiversity if they become islands of habitat in a sea of biological destruction. But as the core building blocks of wildlands networks, they are a venerable and effective means of sustaining living Nature. With them, there is hope. Without them, we leave a legacy of extinction.

Parks and wilderness: Expand. Connect. Restore. Buffer. That's a reasonable agenda—and the right order of priority—for the new American preservation movement.

—TOM BUTLER

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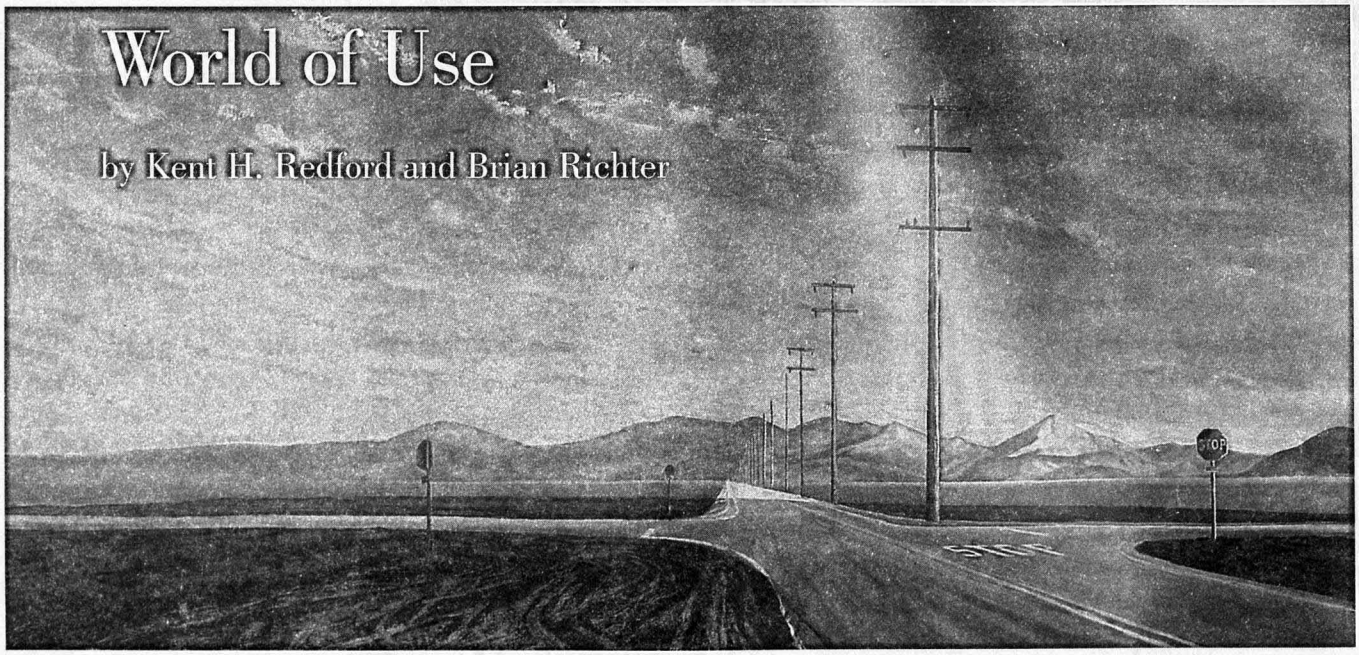
Conservation of Biodiversity in a World of Use

by Kent H. Redford and Brian Richter



Over the last decade biodiversity conservation has become an objective of international conventions, national governments, state agencies, non-governmental organizations, local communities, school clubs, and individuals. Unfortunately, while becoming a common objective, the true meaning of biodiversity conservation has been pulled from its roots in the biological sciences, becoming a political concept with as many meanings as it has advocates. This confusion of meanings can frustrate efforts to mobilize conservation action, because successful conservation relies on clear goals laid out with specific and commonly understood definitions and assumptions.

Of the many confusing concepts associated with biodiversity conservation, few demand greater definition and scrutiny than "conservation through use," sometimes known as "compatible" or "sustainable" use. At face value these terms suggest that certain types or levels of human use are ecologically benign, incurring little or no loss of biodiversity. In fact, it was the promise that such human use would serve as the basis for conservation that brought so many different interest groups to agree on the importance of biodiversity conservation. Advocates of compatible use have suggested that substituting a compatible use for an incompatible one, or helping to perpetuate an existing use deemed as being compatible, is a reasonable strategy for conserving biodiversity. But strong warnings have been issued by conservation biologists such as Freese (1998): "Human intervention in an ecosystem for commercial purposes inevitably alters and generally simplifies, at some scale, ecosystem structure, composition, and function."

This editorial is derived from a longer, technical article published in Conservation Biology *(1999, vol. 13, pp. 1246–1256) and is adapted with permission. Please consult the original paper for an expanded treatment of the authors' analysis and a full list of references.*

illustrations by Barrie Mottishaw

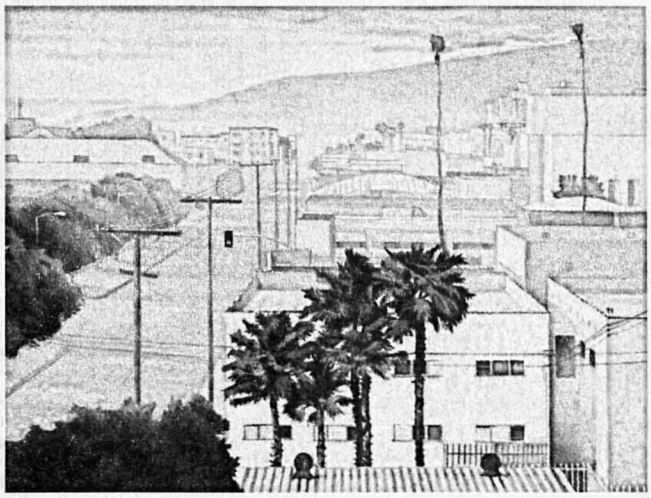
We maintain that compatibility between human use and biodiversity conservation cannot be stated in binary terms as a "yes" or "no" condition. All use has consequences. Different kinds and intensities of human use affect various aspects or components of biodiversity to differing degrees. Further, individual or societal decisions about the degree of biodiversity impact that is deemed "compatible" are value dependent and should be recognized as such. In reality, the incidence, the source, and the effects of many changes are often unclear, and that lack of clarity impedes action on both political and practical levels.

Because the interaction between biodiversity and human use results in such complex impacts and variable degrees of conservation, we believe that some means of measuring the success of biodiversity conservation efforts is desperately needed. In that spirit, we have proposed a heuristic framework for measuring the consequences of human use for biodiversity. This framework builds from a matrix presented by Noss (1990) and draws from a very specific definition of biodiversity.

Biodiversity refers to the *natural* variety and variability among living organisms, the ecological complexes in which they naturally occur, and the ways in which they interact with each other and with the physical environment. Biodiversity has three different components: genetic, population/species, and community/ecosystem. Each of these components has compositional, structural, and functional attributes. *Composition* refers to the identity and variety of elements in each of the biodiversity components. *Structure* refers to the physical organization or pattern of the elements. *Function* refers to ecological or evolutionary processes acting among the elements.

We suggest that the effects of human use or alteration on biodiversity can be assessed with our framework by determining how different types and intensities of resource use affect both the components of biodiversity and their attributes as defined above. In order to test the application of the framework, we examined conservation efforts at two sites where The Nature Conservancy has been working: the Roanoke River in North Carolina and the Pantanal in Brazil. We then additionally tested the framework against illustrative examples of human resource use from the literature.

The results of our assessments demonstrate that the full range and expression of biodiversity components and attributes can be conserved only in ecological systems that are altered either very little or not at all. In those systems in which human impacts are more pronounced, the different biodiversity components and attributes are often affected. Some of these components and attributes are more sensitive to human use, while others are



more robust. For example, genetic effects appear under much lighter regimes of use than do changes in ecosystem function.

We found that all consumptive use affects biodiversity in some attribute or component, commonly affecting not only the target component but other components as well. For example, the genetic component has been shown to be adversely affected by harvesting, be it fishing, logging, or trophy hunting. The population/species component is most commonly understood to be affected by human uses, and much work has demonstrated this, although subtle effects are often missed. Of increasing importance is an understanding of how the community/ecosystem component has been and is being affected by human activities. The extent to which the different attributes are affected by use remains a little understood and important topic for further research.

The primary points we gained from our analyses are that:

- different degrees of human use or alteration result in different negative effects on biodiversity;
- some components and attributes of biodiversity are more sensitive than other components to human use or alteration; and
- only extremely limited use or virtually no alteration will protect all components.

IN OUR DAILY WORK WE CONFRONT THE DISCORDANCE between the view that humans can use biodiversity without causing any harm, and our experience, shared by many of our peers, that this is not possible.

We follow in a long history of those who advocate that all biological entities and their environments have intrinsic value independent of their usefulness to humans. This value applies not just to species, or communities, or ecosystems, but to the complex intertwined web of life that has come to be called biodiversity. In such a value system, the preservation of biodiversity for its own sake, in its entirety and in its component parts, is a legitimate objective in and of itself. Our analysis suggested

that biodiversity in its entirety can be conserved only in areas of very limited or no human use. But the vast majority of both the terrestrial and aquatic world have been, and will continue to be, vital sources of resources for the human population. We live in a world of use. But we must accept the undeniable fact that we cannot fully conserve the biodiversity of this planet through compatible or sustainable resource use strategies alone. All comprehensive biodiversity conservation strategies must be rooted in large protected areas in both the terrestrial and the marine realm.

The literature we sampled for our analysis is part of an ever-growing body of evidence that pinpoints the effects of specific human uses on specific components of biodiversity. By incorporating this evidence into an analytical framework, conservation biologists can work to provide critical *a priori* assessments of the biodiversity costs of resource use. Such an approach would also support working with resource harvesters to improve the effectiveness of their harvesting methods to ensure that those components and attributes that *can* be conserved under their use regimes *are* conserved. This should help to achieve a key goal of moving resource production systems towards more ecologically benign practices.

It is time for conservation biologists to overcome their methodological differences and the limitations of their data and unite to provide answers and approaches to one of the major issues confronting humans and the other inhabitants of our world—how to sustain the full diversity of life in a world of use. ☾

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Effects of resource-use systems on the components and attributes of biodiversity

BIODIVERSITY COMPONENT AND ATTRIBUTE	TYPES OF USE 1	2	3	4	5	6	7
COMMUNITY / ECOSYSTEM							
function	○	◉	◉	◉	●	●	●
structure	○	◉	◉	◉	●	●	●
composition	○	◉	◉	◉	◉	●	●
POPULATION / SPECIES							
function	○	○	○	◉	◉	◉	●
structure	○	○	○	◉	◉	◉	●
composition	○	○	○	◉	◉	◉	●
GENETIC							
function	○	○	○	◉	◉	◉	●
structure	○	○	○	◉	◉	◉	●
composition	○	○	○	◉	◉	◉	●

1) Irrigation supply reservoirs[1]

2) Hydropower dams[2]

3) Intensive fishing on coral reefs[3]

4) Grazing in historically ungrazed forests[4]

5) Water diversion[5]

6) Harvesting nontimber forest products[6]

7) Wilderness river-running[7]

● = ***completely conserved***

◉ = ***partially conserved***

○ = ***not conserved***

1. Western North America: Rood & Mahoney 1990; Poff et al. 1997.
2. Global: Cushman 1985; Moog 1993.
3. Global: Roberts 1995; Laikre & Ryman 1996.
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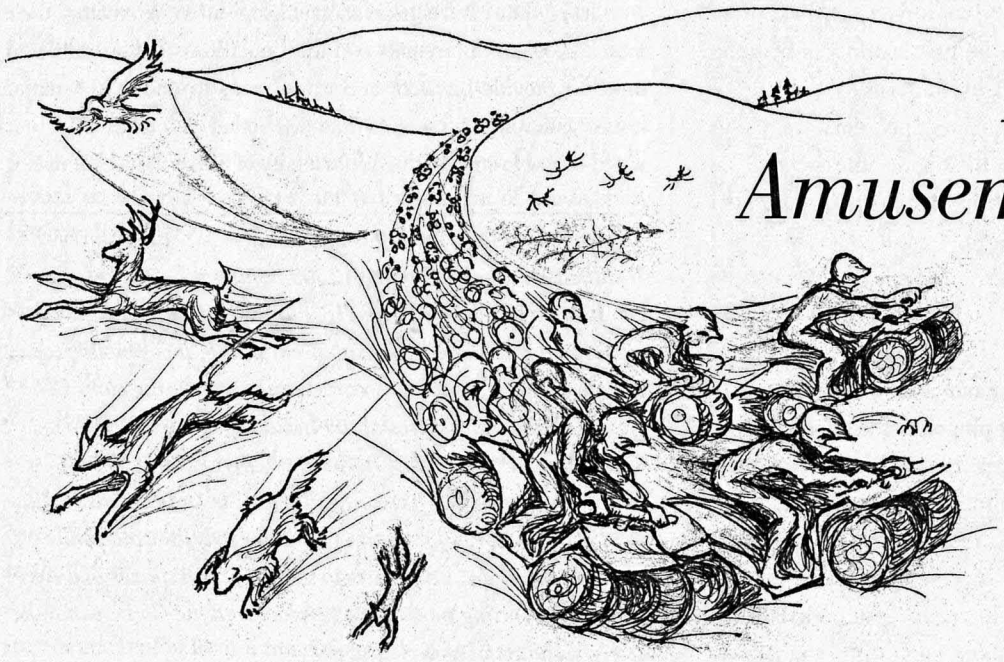
5. Sierra Nevada, California, USA: Harris et al. 1987; Stromberg & Patten 1992.
6. Tropical forests: O'Brien & Kinnaird 1996; Peters 1996.
7. Global: Tejada-Flores 1978; B.D. Richter, personal observation.



Nature as Amusement Park

by Roz McClellan

For wildlands proponents grounded in the principles of conservation biology, modern day conferences on outdoor recreation feel like an Alice in Wonderland world of opposites. These gatherings are sprinkled with references to "landscape linkages," "connectivity," "roadless areas," and "stream corridors." But recreation activists use these terms very differently than conservation biologists.

Take the recent Recreation Capacity Congress,* a multi-day forum during which land managers, outfitters, outdoor educators, mountain bike and motorized trail advocates, and conservationists debated the merits of expanding commercial recreation on public lands administered by the Forest Service, Bureau of Land Management, and National Park Service.

The conference was a showcase for three emerging trends. First, Nature was being redefined as a social rather than a biological or utilitarian construct. Second, public lands managers were being recast as recreation "providers" rather than as land stewards. Finally, the meeting was dominated by a new class of recreationists, characterized by their single-minded focus on *access,* who seem to view wild Nature not as intrinsically valuable or as a source of commodities, but as a source of human experience.

The recreationists' use of a familiar lexicon, but with markedly different intent, was striking. Where biologists speak of maintaining connectivity for wildlife, trail groups seek connectivity for humans, promoting long distance trails, for example, that might allow a trail user to cross an entire national forest in a day. Where wildlife advocates look at roadless areas as unfragmented habitat, trails advocates see roadless areas as untapped reservoirs for new trail systems. Where conservationists seek to protect stream corridors for healthy fisheries and aquatic habitat, trails advocates want to protect them for—trails.

The differences don't stop there. Trails activists tend to consider the ecological effects of recreation infrastructure narrowly, viewing trails as linear corridors with limited, site-specific impacts on soils, vegetation, and water. Landscape ecologists, on the other hand, think spatially,

* The conference, sponsored by Colorado State University, was held in Snowmass, Colorado, in late fall 1999 and attracted some 550 participants.

illustration by the author

and look at the pattern of trails across the landscape and how they may break up habitat into smaller patches. Trails advocates tend to push for overcoming access barriers such as private property, streams, and steep grades. Wildlands advocates tend to welcome access barriers for the habitat security they provide.

These differences between biocentric conservationists and trails activists are only one aspect of a much larger shift in the way Nature is being discussed and marketed by a wide spectrum of society—from the outdoor recreation industry, to policy makers, to public lands managers. Increasingly, Nature (a social construct!) is being viewed foremost as a "setting" for human recreational experience.

National forests, for example, are now measured not so much in terms of board feet of timber produced as by "visitor recreation days" and by the number of "riding days" a national forest can provide for high-speed dirt bike, ATV, snowmobile, and mountain bike enthusiasts. Public lands users are referred to as "customers," "clients," and "consumers," while public lands agencies are recasting themselves as "providers" of "customer services" and "visitor satisfaction." Terms such as "stewardship" and "ecosystem integrity" are giving way to "recreation market segmentation," "supply-demand," "input-output models," and "benefits-based management." And by invoking the demographics of a more ethnically diverse society, some recreation advocates would strip the wilderness concept from its central place in American environmentalism, deeming it an outdated "white male ethic."

This redefinition of Nature from biological to social terms is embodied in a national Recreation Agenda recently released by the US Forest Service. In this document, the Forest Service establishes its market niche as providing a "unique brand of nature-based recreation," and proposes to "improve business relationships with [private] contractors" by building expertise in "marketing research, profit and loss contracts and permit administration." The Recreation Agenda will fill the Forest Service funding vacuum left by congressional budget cuts with private sector "partnerships." These partnerships will be aimed at "long-term investments" and "commercial ventures" on Forest Service lands.

The new game of partnerships clearly favors "user groups," who can provide funding and volunteers for infrastructure development, over wildlands proponents. It is a game biased toward "more use" and active development of the land for human pleasure—rather than keeping human use within the ecological carrying capacity of the land.

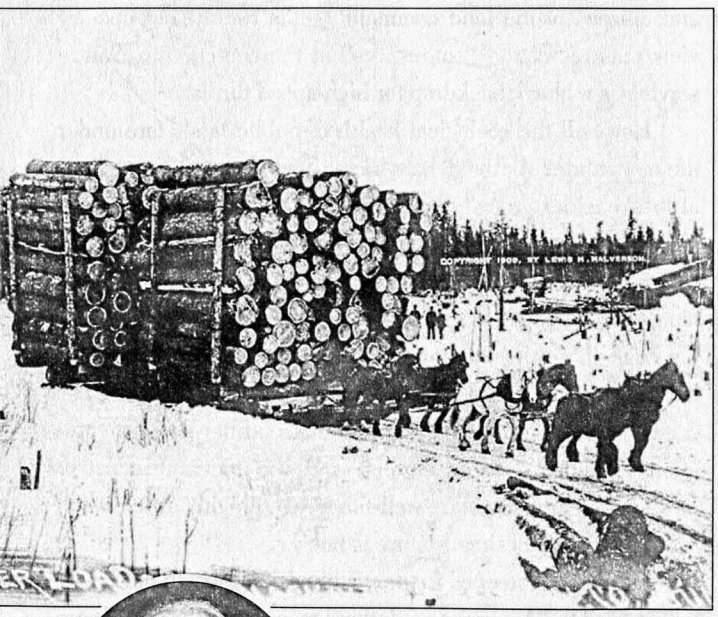
The new social definition of Nature is a far cry from the conservation philosophy articulated by John Muir, Aldo Leopold, Dave Foreman, and others. Instead of Leopold's ethic that centers on land health—with humanity "a plain member and citizen" of the land community—the twenty-first century view puts recreation "enthusiasts" at the center, with Nature serving as a blurry backdrop for high-speed thrills.

How will the ecological health of public lands fare under the new rubric? As the debate increasingly pits one recreational "stakeholder group" against another, will the voice of wild Nature be heard in the fray? How will the habitat requirements of lynx and wolverine stack up against the demands of the motorsports lobby or the outdoor needs of inner-city youth? Will the intangible values of unfragmented habitat and undeveloped backcountry compete well with the profit-making potential these same lands hold for ecotourism ventures, outfitter-guides, recreation equipment manufacturers, and the tourism industry? Recreation enthusiasts are well-funded and highly articulate in expressing their desires. Nature is not.

To someone steeped in the seemingly antiquated land ethic that shaped the American wilderness movement, the use of conservation biology terms by recreationists, the social deconstruction of Nature, and the rush toward Disneyfication of public lands seems slightly unreal. Nonetheless, wildlands advocates can ill afford to ignore the forces working to replace a conservation ethic with a consumer ethic. Fortunately, in this struggle we have public sentiment on our side. State and national polls show that Americans remain unshakably committed to protecting wildlife habitat, even if it means foregoing recreational access to some wild places.

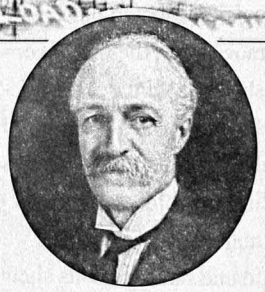
For example, a recent poll in Colorado found that people overwhelmingly support habitat protection over recreational development: 69% of respondents "would support limits on trail use if natural habitat is being damaged" (State Trails Program Stakeholder Survey, 1999). The challenge for conservationists, then, is to fully communicate the ecological value of wildlands, and to help translate the public's abiding commitment to preserving Nature into a resolve for self-restraint, forebearance, and generosity in the face of a fragile natural world. ☾

Veteran wilderness activist **Roz McClellan** *founded and was formerly the executive director of the Southern Rockies Ecosystem Project. She now directs the Rocky Mountain Recreation Initiative (1567 Twin Sisters Rd., Nederland, CO 80466; 303-447-9409). Working with federal, state, and county public land managers, the Recreation Initiative promotes recreation policies that preserve large blocks of wild habitat and wildlife movement corridors, and minimize the ecological impacts of motorized and mechanized trail systems.*



What It All Means

by Gifford Pinchot



The earth and its resources belong of right to its people.

I believe, and I have made no secret of my belief, that a good forester must also be a good citizen. I have tried to be both, with what success it is not for me to say. But at least I am not without experience.

What I have learned in more than half a century of active life, whatever else it may be, is not mere book theory. The conclusions I have reached are based on what I myself have lived, and seen, and known, and had to fight. They are the direct results of responsible work in Forestry and Conservation; in public administration, national and state; in politics, national, state, and local; in city, farm, and frontier; in college and church; in many other phases of American life; and on personal acquaintance with every state in the Union.

Through all my working days, a part of my job, in office and out, and a most essential part, has been to estimate and understand public opinion, and to arouse, create, guide and apply it.

What then, as I see it, is the conclusion of the whole matter?

This: The earth and its resources belong of right to its people.

Without natural resources life itself is impossible. From birth to death, natural resources, transformed for human use, feed, clothe, shelter, and transport us. Upon them we depend for every material necessity, comfort, convenience, and protection in our lives. Without abundant resources prosperity is out of reach.

Therefore the conservation of natural resources is the fundamental material problem. It is the open door to economic and political progress. That was never so true as now.

The first duty of the human race on the material side is to control the use of the earth and all that therein is. Conservation means the wise use of the earth and its resources for the lasting good of men. Conservation is the foresighted utilization, preservation, and/or renewal of forests, waters, lands, and minerals, for the greatest good of the greatest number for the longest time.

This essay is excerpted from Part 13: "Let the People Judge" of Breaking New Ground *by Gifford Pinchot (1998 Commemorative Edition published by Island Press;* * and is reprinted here with permission of Island Press.*

photos: horse logging, 1909, by Lewis Halvorson; Gifford Pinchot, 1921, by Underwood & Underwood

Since Conservation has become a household word, it has come to mean many things to many men. To me it means, everywhere and always, that the public good comes first.

To the use of the natural resources, renewable or nonrenewable, each generation has the first right. Nevertheless no generation can be allowed needlessly to damage or reduce the future general wealth and welfare by the way it uses or misuses any natural resource.

Nationally, the outgrowth and result of Conservation is efficiency. In the old world that is passing, in the new world that is coming, national efficiency has been and will be a controlling factor in national safety and welfare.

Internationally, the central purpose of Conservation is permanent peace. No nation, not even the United States, is self-sufficient in all the resources it requires. Throughout human history one of the commonest causes of war has been the demand for land. Land (agricultural land, forest land, coal, iron, oil, uranium, and other mineral-producing land) means natural resources.

Therefore, world-wide practice of Conservation and fair and continued access by all nations to the resources they need are the two indispensable foundations of continuous plenty and of permanent peace.

Conservation is the application of common sense to the common problems for the common good. Since its objective is the ownership, control, development, processing, distribution, and use of the natural resources for the benefit of the people, it is by its very nature the antithesis of monopoly. So long as people are oppressed by the lack of such ownership and control, so long will they continue to be cheated of their right to life, liberty, and the pursuit of happiness, cheated out of their enjoyment of the earth and all that it contains. It is obvious, therefore, that the principles of Conservation must apply to human beings as well as to natural resources.

The Conservation policy then has three great purposes.

First: wisely to use, protect, preserve, and renew the natural resources of the earth.

Second: to control the use of the natural resources and their products in the common interest, and to secure their distribution to the people at fair and reasonable charges for goods and services.

Third: to see to it that the rights of the people to govern themselves shall not be controlled by great monopolies through their power over natural resources.

Two of the principal ways in which lack of Conservation works out in damage to the general welfare are: A) by destruction of forests, erosion of soils, injury of waterways, and waste of nonrenewable mineral resources. Here is strong reason for Government control. B) by monopoly of natural and human resources, their products and application, and of the instruments by which these are made available.

Monopoly means power—power not only over the supply of natural resources, but also power to fix prices, and to exact unfair profits which lead to higher living costs for the people. It is the very essence of democracy that the greatest advantage of each of us is best reached through common prosperity of all of us. Monopoly is the denial of that great truth.

Monopoly of resources which prevents, limits, or destroys equality of opportunity is one of the most effective of all ways to control and limit human rights, especially the right of self-government.

Monopoly on the loose is a source of many of the economic, political, and social evils which afflict the sons of men. Its abolition or regulation is an inseparable part of the Conservation policy.

And that is far from the whole story. What the people are forced to pay for Concentrated Wealth and its monopolies is by no means confined to an unjustly high cost of living. A moral and intellectual price, a price in knowledge and understanding, in education, in degradation of standards, and in limited freedom of thought and action, must be paid also. Here may well be the heaviest cost of all....

I BELIEVE IN FREE ENTERPRISE—FREEDOM FOR THE common man to think and work and rise to the limit of his ability, with due regard to the rights of others. But in what Concentrated Wealth means by free enterprise—freedom to use and abuse the common man—I do not believe. I object to the law of the jungle.

The earth, I repeat, belongs of right to all its people, and not to a minority, insignificant in numbers but tremendous in wealth and power. The public good must come first.

The rightful use and purpose of our natural resources is to make all the people strong and well, able and wise, well-taught, well-fed, well-clothed, well-housed, full of knowledge and initiative, with equal opportunity for all and special privilege for none.

Whatsoever ye would that men should do to you, do ye even so to them. ☾

Gifford Pinchot *(1865–1946), staunch advocate of resource extraction from federal land, was appointed first chief of the US Forest Service in 1905 by Theodore Roosevelt. He worked tirelessly to create the national forests and to ensure that they were retained in public ownership. As a young man, Pinchot greatly admired German tree farms, and was famous as a pioneer in "scientific forestry." Pinchot also relished the political life and, in a long career, helped to start the Yale School of Forestry and served two terms as governor of Pennsylvania.*

Anthropocentrism

The world, we are told, was made especially for man—a presumption not supported by all the facts. A numerous class of men are painfully astonished whenever they find anything, living or dead, in all God's universe, which they cannot eat or render in some way what they call useful to themselves. They have precise dogmatic insight of the intentions of the Creator, and it is hardly possible to be guilty of irreverence in speaking of *their* God any more than of heathen idols. He is regarded as a civilized, law-abiding gentleman in favor either of a republican form of government or of a limited monarchy; believes in the literature and language of England; is a warm supporter of the English constitution and Sunday schools and missionary societies; and is as purely a manufactured article as any puppet of a half-penny theater.

With such views of the Creator it is, of course, not surprising that erroneous views should be entertained of the creation. To such properly trimmed people, the sheep, for example, is an easy problem—food and clothing "for us," eating grass and daisies white by divine appointment for this predestined purpose, on perceiving the demand for wool that would be occasioned by eating of the apple in the Garden of Eden.

In the same pleasant plan, whales are storehouses of oil for us, to help out the stars in lighting our dark ways until the discovery of the Pennsylvania oil wells. Among plants, hemp, to say nothing of the cereals, is a case of evident destination for ships' rigging, wrapping packages, and hanging the wicked. Cotton is another plain case of clothing. Iron was made for hammers and ploughs, and lead for bullets; all intended for us. And so of other small handfuls of insignificant things.

The world, we are told, was made especially for man—a presumption not supported by all the facts.

This essay was originally published in A Thousand-Mile Walk to the Gulf *by John Muir (Boston: Houghton-Mifflin, 1916, pp. 136–41).*

"Summit of the Sierras," 1874, by Thomas Moran ■ photo: John Muir, ca. 1910

and Predation

by John Muir

But what if we should ask these profound expositors of God's intentions, How about those man-eating animals—lions, tigers, alligators—which smack their lips over raw man? Or about those myriads of noxious insects that destroy labor and drink his blood? Doubtless man was intended for food and drink for all these? Oh, no! Not at all! These are unresolvable difficulties connected with Eden's apple and the Devil. Why does water drown its lord? Why do so many minerals poison him? Why are so many plants and fishes deadly enemies? Why is the lord of creation subjected to the same laws of life as his subjects? Oh, all these things are satanic, or in some way connected with the first garden.

Now, it never seems to occur to these far-seeing teachers that Nature's object in making animals and plants might possibly be first of all the happiness of each one of them, not the creation of all for the happiness of one. Why should man value himself as more than a small part of the one great unit of creation? And what creature of all that the Lord has taken the pains to make is not essential to the completeness of that unit—the cosmos? The universe would be incomplete without man; but it would also be incomplete without the smallest transmicroscopic creature that dwells beyond our conceitful eyes and knowledge.

From the dust of the earth, from the common elementary fund, the Creator has made *Homo sapiens*. From the same material He has made every other creature, however noxious and insignificant to us. They are earth-born companions and our fellow mortals. The fearfully good, the orthodox, of this laborious patchwork of modern civilization cry "Heresy" on every one whose sympathies reach a single hair's breadth beyond the boundary epidermis of our own species. Not content with taking all of earth, they also claim the celestial country as the only ones who possess the kind of souls for which that imponderable empire was planned.

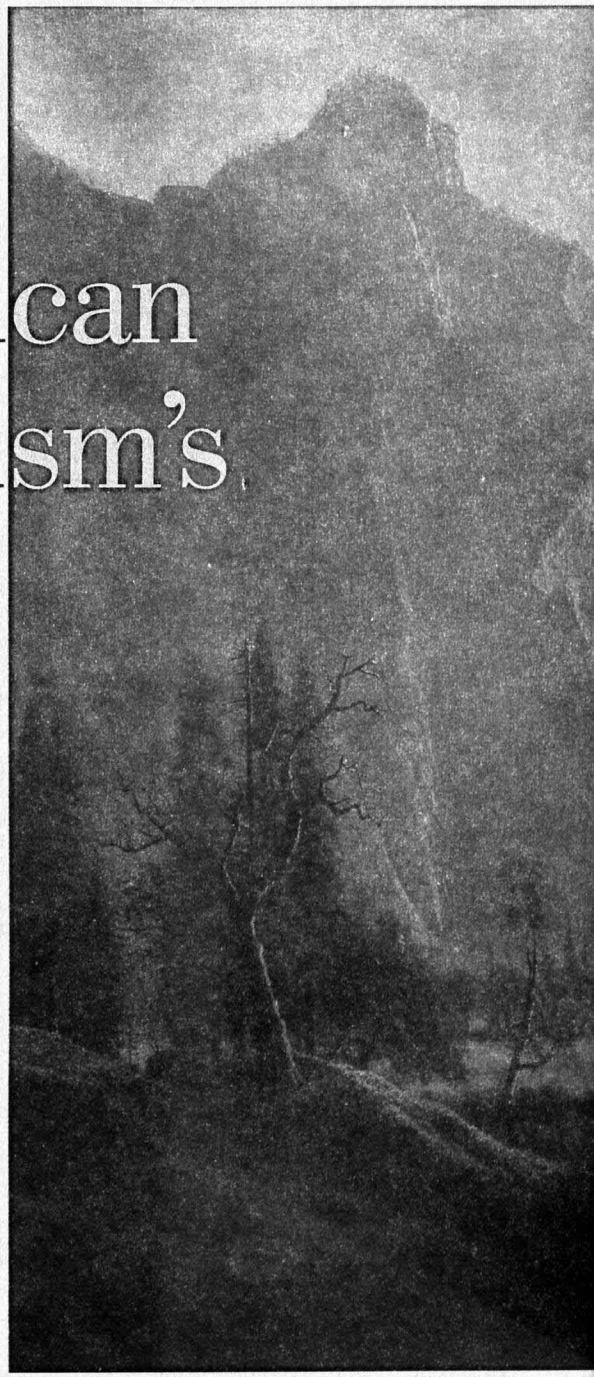
This star, our own good earth, made many a successful journey around the heavens ere man was made, and whole kingdoms of creatures enjoyed existence and returned to dust ere man appeared to claim them. After human beings have also played their part in Creation's plan, they too may disappear without any general burning or extraordinary commotion whatever.

Plants are credited with but dim and uncertain sensation, and minerals with positively none at all. But why may not even a mineral arrangement of matter be endowed with sensation of a kind that we in our blind exclusive perfection can have no manner of communication with?

But I have wandered from my object. I stated a page or two back that man claimed the earth was made for him, and I was going to say that venomous beasts, thorny plants, and deadly diseases of certain parts of the earth prove that the world was not made for him. When an animal from a tropical climate is taken to high latitudes, it may perish of cold, and we say that such an animal was never intended for so severe a climate. But when man betakes himself to sickly parts of the tropics and perishes, he cannot see that he was never intended for such deadly climates. No, he will rather accuse the first mother of the cause of the difficulty, though she may never have seen a fever district; or will consider it a providential chastisement for some self-invented form of sin.

Furthermore, all uneatable and uncivilizable animals, and all plants which carry prickles, are deplorable evils which, according to closet researches of clergy, require the cleansing chemistry of universal planetary combustion. But more than aught else mankind requires burning, as being in great part wicked, and if that transmundane furnace can be so applied and regulated as to smelt and purify us into conformity with the rest of the terrestrial creation, then the tophetization of the erratic genus *Homo* were a consummation devoutly to be prayed for. But, glad to leave these ecclesiastical fires and blunders, I joyfully return to the immortal truth and immortal beauty of Nature. ☾

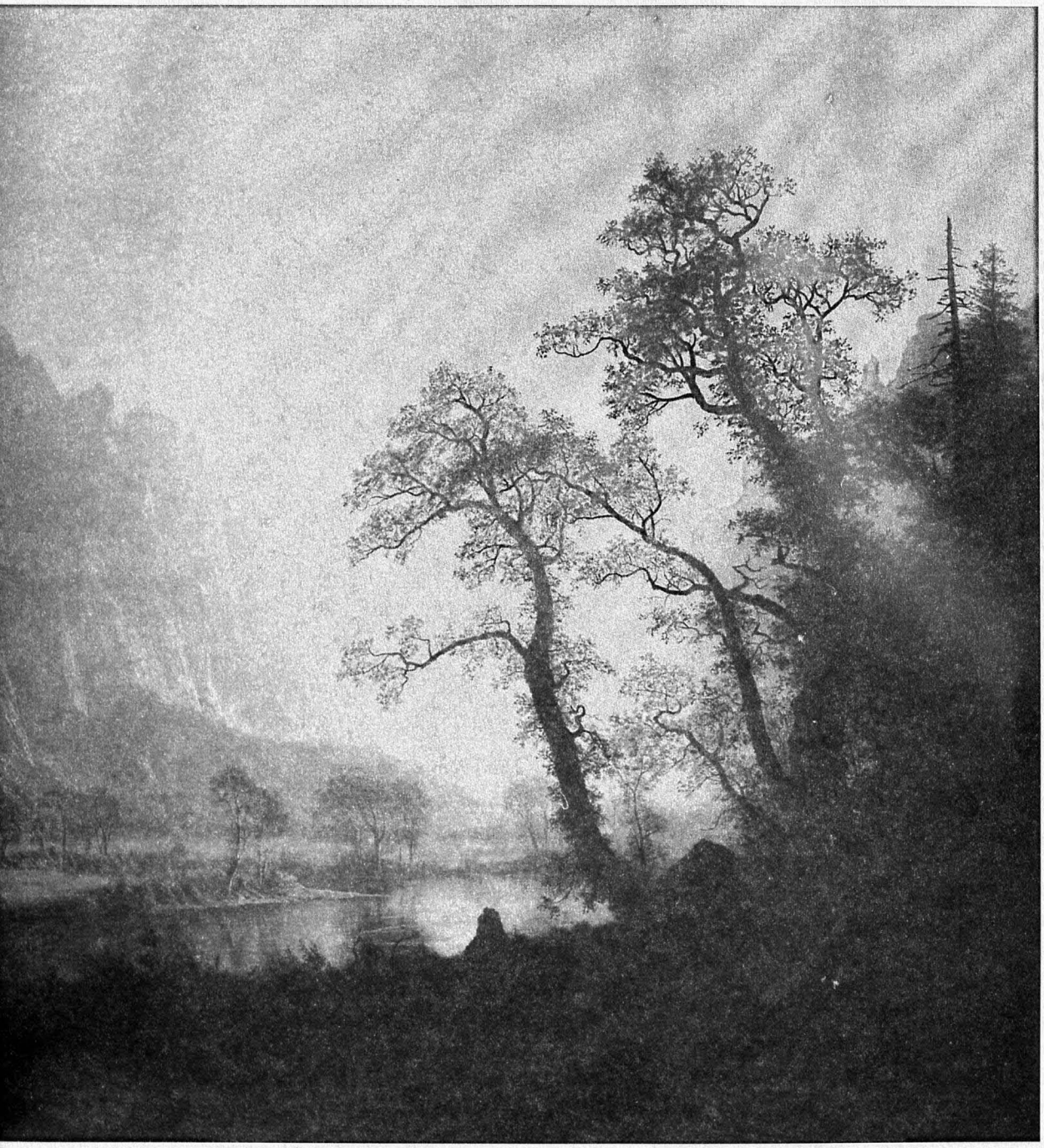
John Muir *(1838–1914), icon of American wilderness preservation, left Indiana in the fall of 1867 to walk to the Gulf of Mexico. His journal of the trip marks the beginning of a literary journey that produced our greatest naturalist of the Far West. However, the journal, under the title* A Thousand-Mile Walk to the Gulf, *was not published until 1917; it includes this essay. Muir was cofounder of the Sierra Club and served as its first president from 1892 until his death. Muir is largely responsible for the protection of the Grand Canyon, among numerous conservation accomplishments.*



Charting American Environmentalism's Early (Intellectual) Geography, 1890–1920

by James Morton Turner

The oft-told tale of American environmentalism suggests that since the 1890s, environmentalism has been neatly divided into two opposing camps—the resource conservationists versus the Nature preservationists. No event seems to capture this bifurcation more starkly than the early-twentieth-century battle over the Sierra Nevada's Hetch Hetchy valley. In the aftermath of San Francisco's devastating 1906 earthquake and fire, the city's civic elite cast this valley, in the northwest corner of Yosemite National Park, as the only reservoir site that assured the growing metropolis's future water supply. When the city appealed to Theodore Roosevelt's administration for rights to the valley, Hetch Hetchy embroiled the nation in debate over the value of national parks, the management of the nation's resources, and the meaning of progress.[1]



From 1908 to 1913, conservationists and preservationists made national headlines arguing over Hetch Hetchy's future. Gifford Pinchot, Chief of the Forest Service and close advisor to Roosevelt, emerged as the conservationists' most powerful voice. Although conservationists regretted marring Hetch Hetchy, they deemed it a reasonable cost for securing a reliable water supply for San Francisco. This reasoning followed directly from conservationists' scientific approach to managing the nation's rivers, forests, and grazing lands. Conservationists firmly believed only the disinterested calculus of the engineer could provide long-term management for the nation's resources.

Preservationists opposed the conservationists' hard-nosed reasoning, instead arguing that monumental scenery alone justified permanent protection of America's most scenic treasures. John Muir best captured these sentiments in his early-twentieth-century essays. He described Hetch Hetchy's scenery, evoked romantic conceptions of the American West, and questioned what, if not the national parks, would be held sacred by the growing nation.

"Sunrise, Yosemite Valley," ca. 1863, by Albert Bierstadt

By the time water began backing up Hetch Hetchy's granite walls, as the story usually unfolds, the fundamental divisions in American environmentalism had been wrought. When Samuel P. Hays included Hetch Hetchy in his classic text, *Conservation and the Gospel of Efficiency* (1959), no doubt he marshaled these terms well aware of the 1950s battle pitting David Brower, the Sierra Club, and the nation's environmentalists against the Army Corps of Engineers, who proposed damming Echo Park in Dinosaur National Monument. In the 1910s, 1950s, or during the Trans-Alaskan Pipeline controversy in the 1970s, it appeared as Aldo Leopold suggested early on: this "was the old conflict between preservation and use...."[2] Throughout the twentieth century, historians and environmentalists have relied upon this dualism, canonized during Hetch Hetchy, as if it provided the fundamental intellectual scaffolding of American environmentalism.

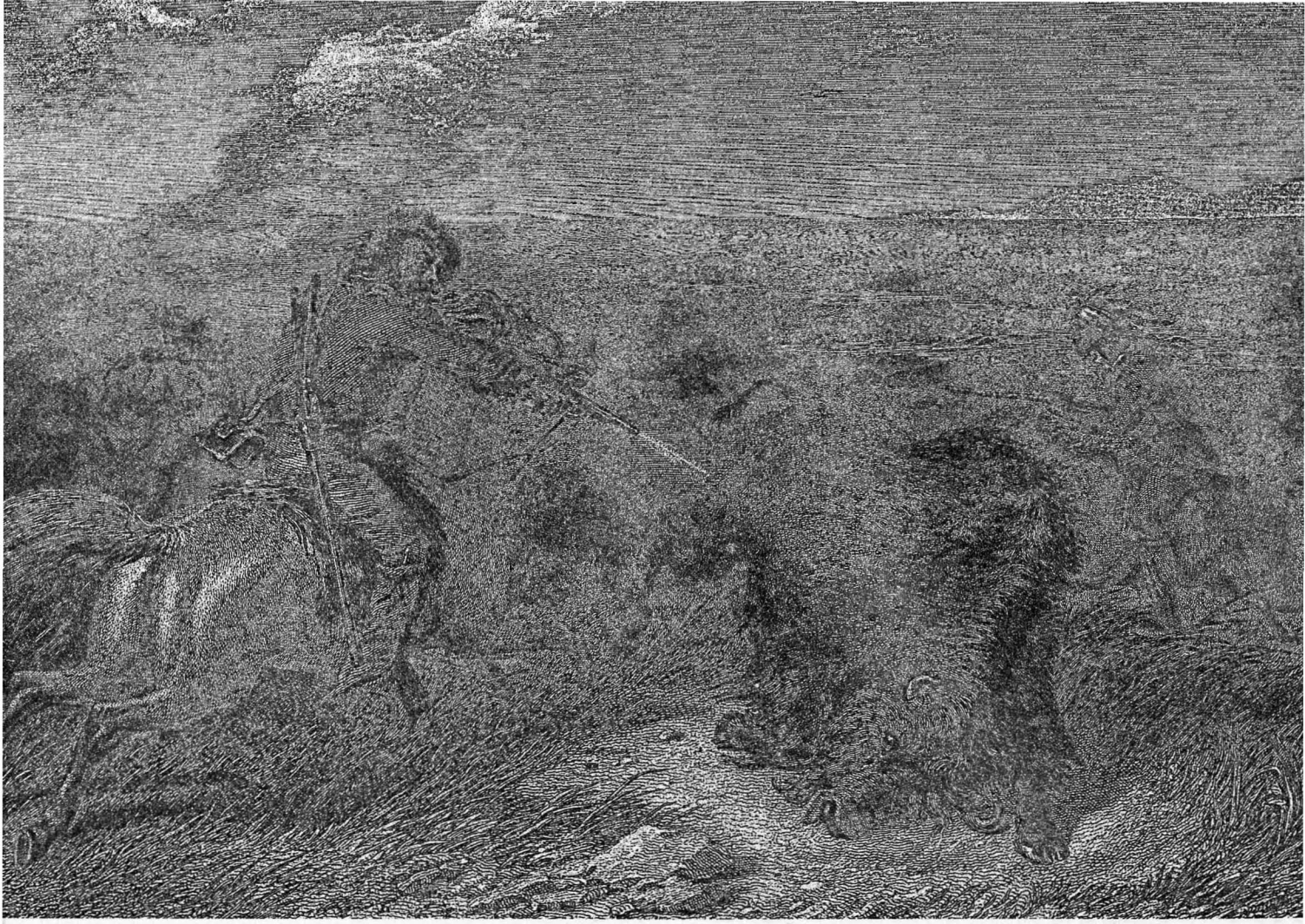
Survey American environmentalism now and the weaknesses of this scaffolding become apparent. In today's environmental politics, only careful explication can avoid muddling the meanings of conservation and preservation. Perhaps the reason for the confusion is that these terms were no more clearly defined during American environmentalism's founding years than they are today. In 1895, John Muir wrote that "forest management must be put on a rational, permanent scientific basis, as in every other civilized country."[3] A few months before, Theodore Roosevelt emphasized that "the question of forest preservation is one of utmost moment to the American people."[4] Preservationist or conservationist? These quotes seemingly reverse the traditional allegiances of these two prominent Americans. More important, these statements emphasize how contested these organizing principles of American environmentalism have always been.

Reconsidering the origins of American environmentalism casts new light on this long-standing dualism. In 1890, the nation's public domain remained largely uncharted: little more than the boundaries of states, territories, and Indian reservations marked the West's geography. By 1920, national forests, national parks, and national monuments lay like puzzle pieces across maps of the American West. In those thirty years, the geographic and intellectual contours of American environmentalism emerged together. Tracing the start of the parks, the first forest reserves, and the beginnings of the Antiquities Act illuminates many issues underpinning our nation's environmental politics. In reducing this period—or any period of American environmental history—to conservation versus preservation, we risk losing the plurality of ideas important to our environmental heritage.

If a debate over conservation and preservation did not define early American environmentalism, what did? A constellation of concerns, discussed throughout the nineteenth century, coalesced towards the century's end. Photographs and paintings of the West increasingly excited an appreciation for the extent and magnitude of the nation's scenery. Scientists warned that rapacious loggers seemed well on their way to denuding mountainsides from coast to coast, threatening the future of the nation's forests, rivers, and soils. Ecological disasters that humans inflicted on passenger pigeons, the bison, and Pacific fur seals further emphasized Nature's fragility. And as the nation's cities grew, so too did its industries. From railroads to steel companies, all seemed ready to harness the country's natural resources—economic and scenic—and exploit them for private gain. In 1893, Frederick Jackson Turner, observing the many changes of the nineteenth century, made his now famous speech that lamented the closing of the American frontier. Despite Turner's prejudices, his assertions helped establish new intellectual boundaries for America's earliest environmentalists. After a century of imperial expansion, the nation's resources no longer appeared unlimited.[5]

The 1890s marked a watershed in the federal government's approach to the public domain. Immediately after the Civil War, Congress dealt with public land by giving it away: while homesteaders laid claim to 160-acre parcels of the West, railroads made off with tracts measured by the square mile. National parks marked the earliest steps towards permanent federal stewardship. In 1864, moved by the romantic paintings of Albert Bierstadt and photographs of Carleton Watkins, Congress protected Yosemite Valley. A decade later, the Washburn expedition returned from Yellowstone with a remarkable account of the region's scenic grandeur and thermal features. Unsure of the extent of the wonders, Congress set aside a vast stretch of northwest Wyoming. Park status, however, conferred only tenuous protection on Yellowstone and Yosemite. Not all park advocates saw conflict between limited resource development and park protection. Grazing, poaching, and logging soon encroached on the parks' borders. In 1890, confusion over the parks' purpose only deepened when Congress set aside additional land around Yosemite.[6]

Since 1875, the American Forestry Association had advocated federal responsibility for the nation's forests. But as the nineteenth-century timber industry boomed, Congress made few moves to interfere. Early forestry laws, such as the Timber Culture Act (1875) and Timber and Stone Act (1878), only made the nation's forests more accessible to homesteaders (and the timber companies who usurped their claims). In the 1880s, the



Forestry Association urged Congress to survey the nation's forests and set aside reserves for future needs. In 1890, Congress took hesitant steps in this direction. Responding to a chorus of Californians, which included both John Muir and water-hungry agriculturalists, Congress set aside an additional million acres of California's High Sierra. Confusion over whether the land was a national park or a protected watershed mounted: Congress mandated the "preservation from injury of all timber, mineral deposits, natural curiosities or wonders within said park, and their retention in their natural condition." But instead of specifically declaring it a park, as it had Yosemite and Yellowstone, Congress designated these High Sierra lands a "forest reserve."[7]

Thus, by 1890, both federal parks and reserves existed—but as rather indistinct entities. The ensuing decade of political wrangling would clarify their purpose and the many issues important to the nascent American environmental movement. The following year, Congress passed the Forest Reserve Act, granting the President new power over the public domain: the President "may, from time to time, set apart and reserve...public land bearing forests."[8] Historians speculate that Congress hardly realized the implications of the Forest Reserve Act—it passed through Congress as a one-paragraph addendum to a general land law. President Harrison, however, quickly made its purpose clear: within a year he set aside 15 forest reserves encompassing 13 million acres of land.[9] The pithy act, however, made no provisions for managing the new reserves. According to the Department of the Interior, which oversaw the reserves, a strict interpretation suggested, "no one has a right to enter a forest reserve, to cut a single tree from its forests, or to examine its rocks in search of valuable minerals."[10] For a time, forest reserves appeared even more restrictive than the nation's parks: trespass, alone, was illegal. Historians Samuel Hays and Roderick Nash have suggested preservationists rallied around these reserves for precisely these ambiguous, yet restrictive, covenants.[11]

Provisions for administering the reserves, however, only needed to catch up with reserve designation. The Forestry Association, John Muir, and the newly founded Sierra Club all urged Congress to pass additional legislation. Without such provisions, forest reserves remained a hollow declaration, neither providing funds for protection nor for use. By 1895, this lack of

engraving, 1870, by Felix Darley

administration stalled the early forest reserve system. After setting aside five million acres in 1893 and 1894, President Cleveland ceased designating reserves, delaying further action until Congress passed new forestry legislation. Two immediate proposals, the McRae and Paddock forestry bills, failed to pass. Much of the blame went to western representatives, beholden to timber interests and resistant to federal government, who opposed all federal control.[12] Muir cast an accusatory finger: "the outcries we hear against forest reservations come mostly from thieves who are wealthy and steal timber by wholesale."[13]

In 1895, in lieu of legislation, Congress funded a National Forestry Commission with the one-time task of surveying the western forests and parks. *Century Magazine* praised the commission, "whose business it shall be to study the whole question of forest preservation and report fully upon it to Congress."[14] Composed of five well-known naturalists, including Gifford Pinchot, the commission ranged widely across the West for three months, encompassing Montana, Washington, California, and even Arizona in its survey. Upon returning, without regard for western protests, the commission called for additional reserves, a comprehensive forestry policy, and two new parks. Cleveland obliged the first request; in 1896, he declared 13 new reserves totaling 21 million acres.[15]

Cleveland's reserves, on top of the commission's report, sparked a year-long debate over forestry policy in Washington. Congress considered options ranging from eliminating the reserves entirely to placing them under the protective jurisdiction of the military. As Cleveland left office, and President McKinley's administration began, Congress compromised after a bitter debate. It suspended the reserves for one year, and then reestablished them with the provision they be managed under the recently passed 1897 Organic Act. The Organic Act, with the aim of "preserving" the forests, authorized managed logging, mining, and grazing in the forest reserves—the seeds of today's multiple-use management plans.[16] Initially, John Muir emerged as the reserves' most eloquent spokesman, explaining they "will yield plenty of timber, a perennial harvest for every right use." This use, he suggested, would not diminish the forests "any more than the sun is diminished by shining."[17]

The National Forestry Commission did not limit its recommendations to forest reserves alone. The two new parks it called for would protect the Grand Canyon and Washington's Mt. Rainier. Muir wrote of the latter, "if in the making of the West, Nature had what we call parks in mind,—places for rest, inspiration, and prayers,—this Rainier region must surely be one of them."[18] Although Congress did not set aside these parks immediately, earlier in the 1890s it dispatched the US Army to Yosemite and Yellowstone. There, army patrols kept herders and poachers at bay, making the parks the nation's best-protected lands. By the century's end, Congressional legislation and Muir's writings helped delineate the legislative import of the West's new geographic boundaries. Park status provided strict protection against resource use, while forest reserves protected watersheds and ensured future timber supplies. Within these broad guidelines, however, much room remained for future debate over administering these public lands.

"Giant's Gap," ca. 1870, by Thomas Moran

In reducing this period—or any period of American environmental history—to conservation versus preservation, we risk losing the plurality of ideas important to our environmental heritage.

DID THE 1897 ORGANIC ACT MARK THE PRESERVATIONISTS' first defeat? Historians Samuel Hays and Roderick Nash think so.[19] They sift through the confusion over the administration of parks and forests and the linguistic muddle of conservation and preservation, and draw strict lines between Muir, Pinchot, and their followers. A more open reading of the 1890s finds these categories more contested than these historians admit. Throughout the 1890s, forest reserve advocates called for the "preservation" of the forests. But few called for preserving the forests from use—not even John Muir went that far. Rather, in speeches, newspapers, and magazines, early environmentalists called for "preserving" the forests from fire, grazing, and most troubling, the unrestrained logging that had already felled forests across New England and the Midwest.

Early conservationist sentiments hardly stood apart from this broad-minded preservation rhetoric. If "conservation" entered the debate, it usually referred specifically to managing watersheds. Those dedicated to preservation for strictly spiritual or aesthetic reasons pursued a limited agenda in the nineteenth century: it included protection for California's redwoods, Mount Rainier, the Grand Canyon, migratory birds, and the American bison, among other issues.[20] Little evidence exists that in the 1890s these "preservationists" considered themselves the foes of any emerging group of "conservationists." Ambiguities in the 1890s language have made it easy for historians, and environmentalists alike, to overemphasize the early divisions underlying the nation's environmental movement.[21]

Theodore Roosevelt embodied precisely these ambiguities in early environmentalism. Between 1901 and 1909, his administration tripled the size of the forest reserves, established five new national parks, initiated early federal reclamation projects, and set aside the first national monuments. During his administration, legislating the public domain emerged as a high point in a broad reform agenda. Historians look to these events to mark the growing historical divide between conservationists and preservationists: Gifford Pinchot and John Muir dominated environmental politics, the Department of Agriculture and the Department of Interior staked out their claims on the public domain, and this era culminated in the Hetch Hetchy controversy. Conservation and preservation cannot be ignored in these years—yet the debate cannot be narrowed to these poles alone.

During Roosevelt's tenure, conservation emerged from preservation's rhetorical shadow. Drawing on seemingly democratic and scientific principles, conservation became firmly entrenched in the expanding federal government.[22] The Bureau of Reclamation (1902) aimed to reengineer the hydrology of the West, and the Forest Service (1905) set its sights on bringing all the nation's forests under sustained-yield management. Pinchot, the Department of Agriculture's head of forestry, emerged as the champion of conservation within the Roosevelt administration. "The forest," Pinchot explained, "is a manufacturing plant for the production of wood."[23] And, as would become a refrain for the conservationists, it had to be managed for the "greatest good of the greatest number in the long run."[24] One approving citizen wrote to the *New York Times*, "Let us eliminate sentimentalism. Let us not permit the hard-headed businessman to call us Utopians, but meet the utilitarian and tax payer on his own ground."[25]

Conservationists believed the nation's public domain, including forests, grazing lands, and reservoirs, should be managed with the impartial judgment of professional government officials. Pinchot hoped a growing cadre of college-educated engineers and foresters would bring such scientific rigor to managing the nation's resources. With Roosevelt's support, Pinchot expanded the Forest Service and brought the forest reserves under its purview. In 1905, Congress transferred the reserves from the Department of the Interior to the Department of Agriculture, and rechristened them national forests. Pinchot, the first Chief of the Forest Service, believed it would be only a matter of time before the national parks, too, came under the rational strictures of Forest Service management.[26]

Roosevelt's land initiatives received broad support from the urban denizens who helped elect him to office. Despite Pinchot's disdain for "purely sentimental considerations" regarding Nature, the conservationists' utilitarian approach to the nation's public domain was eminently more acceptable to these urbanites than the wanton exploitation of the previous century.[27] Even the Sierra Club urged its youngest members to entertain a career in the Forest Service: "a man cannot serve his country better than by faithful work in this field."[28] During the same years, historians have noted that Nature, increasingly, represented the antithesis of the nation's early-twentieth-century metropolises—it promised an escape from pollution, immigrants, and disease. As Muir romantically crowed, "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wildness is a necessity...."[29] For many middle-class Americans, the Boy Scouts, mountain resorts, or the writings of John Burroughs and Jack London redefined their perceptions of Nature, spurring what historian Peter Schmitt has labeled the first "Back to Nature" movement.[30]

Preservationists also made legislative and territorial advances during Roosevelt's administration. The same Congress that established the Forest Service armed preservationists with an important new legislative tool: "An Act for the Preservation

of American Antiquities (1905)." The Antiquities Act invested in the President the power to "permanently preserve objects of antiquity and historic interest for the instruction and enjoyment of the people."[31] Importantly, objects of scientific interest, such as archaeological sites or geologic wonders, also fell under the act's scope. Roosevelt first set aside small monuments, such as Devils Tower (1906) and Muir Woods (1908). Then, stretching the act's mandate, he set aside 900,000 acres as the Grand Canyon National Monument (1908).[32] Muir and other preservationists applauded these first national monuments and the newest national parks including Crater Lake, Wind Cave, and Mesa Verde.

Despite these gains, preservationists feared a growing conservation movement that measured success in terms of cords, cubic feet, and tons. In 1908, the nation's governors and conservation leaders gathered in Washington to discuss a national conservation agenda. John Muir, omitted from the guest list, sent a letter representing the Sierra Club. In it, he urged the conference not to forget scenic resources, "whose influence upon the life of the nation, physically, morally, mentally, is inestimable, and whose preservation is the greatest service that one generation can render to another."[33] Conference attendees, however, seemed more interested in the tangible resources of timber, water, and minerals. Dismayed, J. Horace McFarland—president of the American Civic Association and a strong advocate of preservation—published an article titled, "Shall we have ugly conservation?" McFarland's article reflected preservationists' growing concern for the future of the national parks. Speculation over logging, dams, and grazing swirled around the dozen existing parks. Even in the case of Yosemite, the *New York Times* editorialized in 1909, "the talk about leaving nature unspoiled...is nonsensical."[34] For preservationists, only a park agency, comparable to the Forest Service, could safeguard the future of the national parks.

If ever in American environmental history conservation and preservation appeared to dominate the discourse, it is in these years leading up to the decision to flood Hetch Hetchy. But as quickly as this dualism became apparent—as Hetch Hetchy captured the nation's attention—the dualism also began to fall apart, and with it the scaffolding upon which so much environmental thought rests. Revisionist historians have recast Hetch Hetchy from perspectives that unsettle the primacy of the preservation versus conservation dualism. Muir biographer Stephen Fox, in *The American Conservation Movement* (1981), described Hetch Hetchy as a battle contested by amateurs and federal employees with divergent ideas about how to manage the public domain. Fox explained that Hetch Hetchy was "in short, another collision of professionals and amateurs."[35] More recently, Gray Brechin's *Imperial San Francisco* (1999) takes up an underlying current in Hay's and Nash's earliest accounts of Hetch Hetchy—the importance of anti-monopoly sentiment and San Francisco's urban politics to the debate. For the city's urban elite, harnessing Hetch Hetchy emerged as a critical step in freeing the city from the Spring Valley Water Company, ensuring San Francisco's continued economic expansion, and facilitating its dominance over the Pacific Rim. Ultimately, neither the arguments of conservationists nor preservationists determined Hetch Hetchy's fate.[36]

To the extent that Fox and Brechin meant to imply that other factors best explain why Hetch Hetchy became a reservoir, they are surely right. And in moving beyond the historiographical duality Hays and Nash helped erect, Fox and Brechin not only shed new light on the Hetch Hetchy debate, they also facilitate our understanding of later American environmental history. In 1916, partly in reaction to Hetch Hetchy, Congress further protected the national parks under the newly established National Park Service. Even then, conservation rhetoric based on efficient administration and tourist revenues undermined any

Framing Hetch Hetchy or Echo Park in terms that pit the preservationists against the conservationists has long empowered the American environmental narrative...but it is important to recognize that the critical junctures in American environmentalism—for better or worse—have emerged from a middle ground that is neither "conservationist" nor "preservationist."

assertion of a preservationist victory.[37] In the 1920s, Arthur Carhart and Aldo Leopold helped give the American wilderness movement its first institutional home—in Gifford Pinchot's Forest Service. And a decade later, Benton MacKaye and Lewis Mumford joined with others in founding the Regional Planning Association of America that helped promote the Appalachian Trail and influenced the Tennessee Valley Authority. None of these events conforms to a rigid dualism marked by conservationist and preservationist ethics. And this list could go on.

Why then do many historians and environmentalists continue to depend upon this dualism? Today, as often as not, newspapers ignore history altogether and use conservation and preservation interchangeably. Or, worse yet, these terms are caricatured, as they were by Peter Huber, author of *Hard Green* (1999), who tried to warn conservationists that, "the preservationist vision is back on top. The quasi-pagan nature worship of the late 19th century has been reworked as the trans-scientific demonology of the late 20th."[38] As suggested by the debate revolving around these categories and disagreement among environmentalists today, this dualism obscures as much as it reveals about American environmentalism. The persistence of this dualism, however, rests in its romantic appeal. Framing Hetch Hetchy or Echo Park in terms that pit the preservationists against the conservationists has long empowered the American environmental narrative.[39] Entirely abandoning the romanticism is hardly necessary, but it is important to recognize that the critical junctures in American environmentalism—for better or worse—have emerged from a middle ground that is neither "conservationist" nor "preservationist." ☾

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NOTES

1. In this essay, I use the terms "environmental movement" and "environmentalists." Although this is admittedly ahistorical, in an essay investigating the meanings of conservation and preservation these broader terms are helpful since they encompass many thoughtful approaches to the land around us.
2. Aldo Leopold, "The wilderness and its place in forest recreational policy," *Journal of Forestry,* Nov (1921), 148.
3. John Muir, "Proceedings of the meeting of the Sierra Club," in *Sierra Club Notes* (San Francisco, 1895), 284.
4. Theodore Roosevelt, "A plan to save the forests: forest preservation by military control," *Century* 49, no. 4 (1895), 630.
5. On Turner's significance, see his original essays and the accompanying commentary in Frederick Jackson Turner, *Rereading Frederick Jackson Turner: The Significance of the Frontier in American History, and Other Essays* (New York: Henry Holt, 1994).
6. For a comprehensive introduction to the history of the national parks, see Alfred Runte, *National Parks: The American Experience* (Lincoln: University of Nebraska, 1997), chapters 1–2.
7. "An act to set apart certain tracts of land in the State of California as forest reservations, approved October 1, 1890 (26 Stat. 650)" reprinted in Hillory A. Tolson, ed. *Laws Relating to the National Park Service, the National Parks, and Monuments* (Washington: GPO, 1933), 49.
8. 26 US Stat. 1095 (March 3, 1891), Section 24.
9. The best introduction to the Forest Service's early history is Harold K. Steen, *The US Forest Service: A History* (Seattle: University of Washington, 1976), chapter 2.
10. Originally quoted in "The Forest Commission's Great Public Service," *Century* 54, no. 4 (1897), 634.
11. Samuel P. Hays, *Conservation and the Gospel of Efficiency* (Forge Village, MA: Murray Printing, 1959), 190–191. Roderick Nash, *Wilderness and the American Mind,* 3rd ed. (New Haven: Yale University Press, 1982), 133–137.
12. Steen, *The US Forest Service: A History*, chapter 2.
13. John Muir, "The American forests," *Atlantic Monthly* 80, Aug (1897), 155.
14. "The need of a national forest commission," *Century* 49, no. 4 (1895), 634.
15. Steen, *The US Forest Service: A History,* 32–33.
16. Paul W. Hirt, *A Conspiracy of Optimism: Management of the National Forests since World War Two* (Lincoln: University of Nebraska Press, 1994), 30–31.
17. John Muir, "The American forests," 147, 156.
18. John Muir, "The wild parks and forest reservations of the West," *Atlantic Monthly,* Jan (1898), 26.
19. Hays, *Conservation and the Gospel of Efficiency,* 190–191. Nash, *Wilderness and the American Mind*, 138.
20. For a compelling account of the plight of the American bison and its importance to early American environmentalism, see Andrew C. Isenberg, *Destruction of the Bison: An Environmental History* (New York: Cambridge University Press, 2000).
21. These ambiguities are considered in Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven: Yale University Press, 1997), 41–44 and Runte, *National Parks,* 84. John P. Wiley, Jr. offers insights into these ambiguities today in "Coming to Terms," *Smithsonian* 29, no. 9 (1998), 28–30.
22. The classic account of the conservation movement is Hays, *Conservation and the Gospel of Efficiency*.
23. Gifford Pinchot, "Forest destruction," in *Smithsonian Annual Report* (Washington, DC: GPO, 1901), 404.
24. Letter to Chief of the Forest Service from Secretary of Agriculture James Wilson, Feb. 1, 1905 in *The Principal Laws Relating to Forest Service Activities,* Agriculture Handbook No. 453 (Washington, DC: GPO, 1974), 117.
25. James L. Hickok, "Letter to the editor: A plea for the forests," *New York Times,* Apr 6 1902, 14.
26. Hays, *Conservation and the Gospel of Efficiency,* 196.
27. Pinchot, "Forest destruction," 401.
28. William R. Dudley, "Forestry notes," *Sierra Club Bulletin* 6, no. 5 (1908): 334.
29. John Muir, "The American forests," 15.
30. Peter J. Schmitt, *Back to Nature: The Arcadian Myth in Urban America* (New York: Oxford University Press, 1969). On the cult of wilderness, also see Nash, *Wilderness and the American Mind,* chapter 9.
31. *Laws, Decisions, and Opinions Applicable to the National Forests* (Washington, DC: GPO, 1916), 24.
32. Hal Rothman's study of the Los Alamos and the Pajarito Plateau provides important insight into the role of archaeological preservation in the passage of the Antiquities Act, *On Rims and Ridges: The Los Alamos Area Since 1880* (Lincoln: University of Nebraska Press, 1992), chapters 4–6.
33. John Muir et al., "Letter to the President of the United States and the Governors of the States Assembled in Conference" reprinted in *Sierra Club Bulletin* 6, no. 5 (1908): 318–319.
34. "Desecration was not suggested," *New York Times,* Oct 15, 1909, 8.
35. Stephen Fox, *John Muir and His Legacy: The American Conservation Movement* (Madison: University of Wisconsin Press, 1981), 144.
36. Gray Brechin, *Imperial San Francisco: Urban Power, Earthly Ruin* (Berkeley: University of California Press, 1999), 108–117.
37. *Proceedings of the National Park Conference* (Washington, DC: GPO, 1911).
38. Peter Huber, "Saving the environment from the environmentalists," *Commentary* 105, April (1998): 25–30.
39. On the importance of narrative and the power of romanticism in American environmental thought, see William Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature," in *Uncommon Ground: Rethinking the Human Place in Nature,* ed. William Cronon (New York: Norton, 1995), 69–90 and William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* (1992): 1347–1376. For an excellent critique of Cronon's thoughts on wilderness, see David W. Orr, "The not-so-great wilderness debate…" *Wild Earth* 9, Summer (1999): 74–80.

Northern Pacific Railroad panoramic map of Yellowstone National Park, ca. 1895

Creating Tradition

The Roots of National Park Management

by Richard West Sellars

Author's introduction *In this era of heightened environmental concern, it is essential that scientific knowledge form the foundation for any meaningful effort to preserve ecological resources. If the National Park Service is to successfully shoulder this complex, challenging responsibility at last, it must conduct scientifically informed management that insists on ecological preservation as the highest of many worthy priorities. To understand why the National Park Service has never achieved this goal, one must consider the history of natural resource management in the National Park System.* —**RWS**

The central dilemma of national park management has long been the question of exactly what in a park should be preserved. Is it the scenery—the resplendent landscapes of forests, streams, wildflowers, and majestic mammals? Or is it the integrity of each park's entire natural system, including not just the biological and scenic superstars, but also the vast array of less compelling species, such as grasses, lichens, and mice? The incredible beauty of the national parks has always given the impression that the scenery alone is what makes them worthwhile and deserving of protection. Scenery has provided the primary inspiration for national parks and, through tourism, their primary justification. Thus, a kind of "facade" management became the accepted practice in parks: protecting and enhancing the scenic facade of nature for the public's enjoyment, but with scant scientific knowledge and little concern for biological consequences.

Criticism of this approach began in the 1930s, increased during the environmental era of the 1960s and 1970s, and is commonly voiced today. Nevertheless, facade management based largely on aesthetic considerations remains quite acceptable to many. Far easier to undertake,

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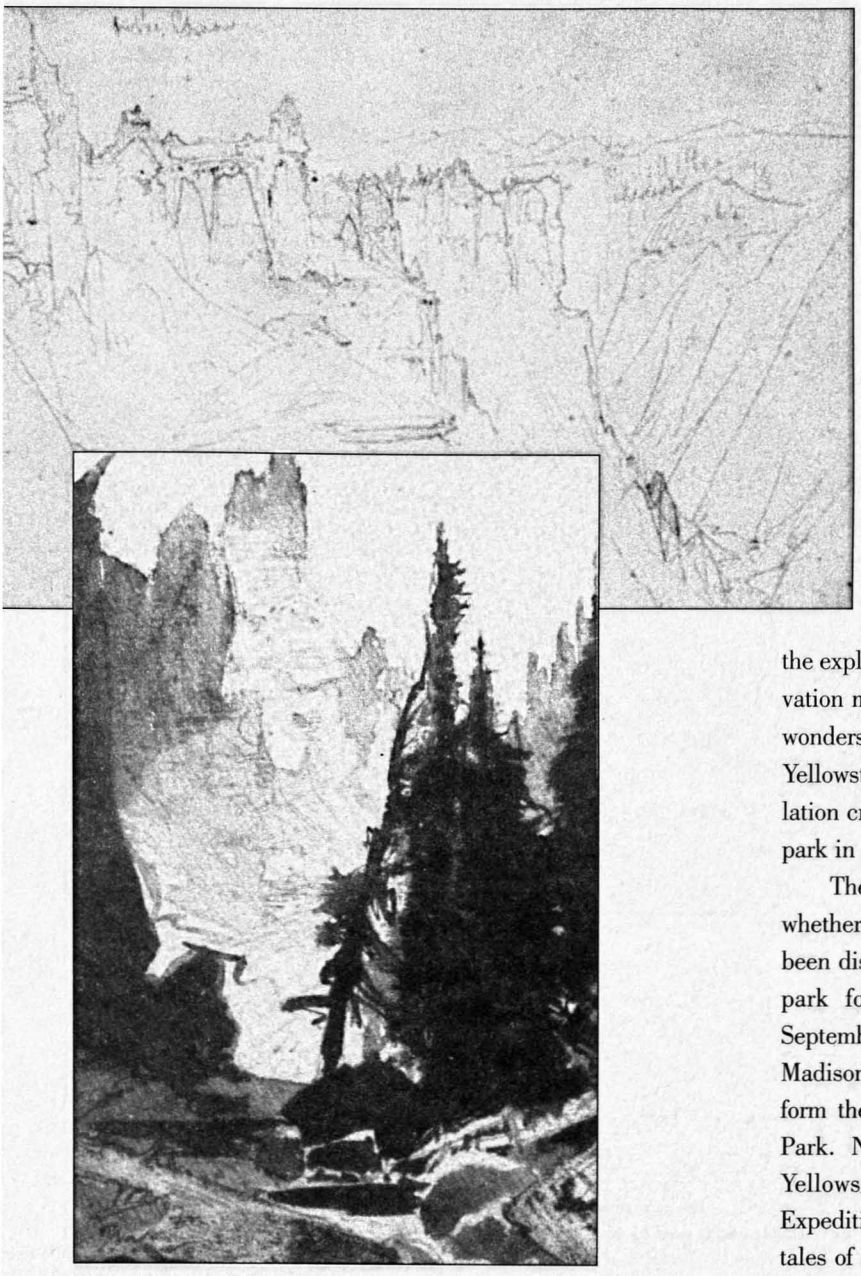
This essay is excerpted from the introduction and first chapter of Richard West Sellars' book Preserving Nature in the National Parks: A History *(©1997 Yale University Press; all rights reserved) and is used by kind permission of the author and Yale University Press. See the extensively referenced book for a complete list of sources.*

and aimed at ensuring public enjoyment of the parks, facade management has long held more appeal for the public, for Congress, and for the National Park Service than has the concept of exacting scientific management.

Yet aesthetics and ecological awareness are not unrelated. Whatever benefit and enjoyment the national parks have contributed to American life, they have undoubtedly intensified the aesthetic response of millions of people to the beauty and the natural history of this continent—a response that could then be pleasurably honored in more ordinary surroundings closer to home. Beyond the sheer enjoyment of scenery, a heightened aesthetic sensibility may have inspired in many a deeper understanding of, and concern for, the natural environment. This benefit defies quantification, but surely it has had consequences of immense value, both for individuals and for the nation.

The persistent tension between national park management for aesthetic purposes and management for ecological purposes underlies much of the history of the National Parks.



field studies from the Hayden Yellowstone expedition, 1871, by Thomas Moran

ON MARCH 1, 1872, CONGRESS ESTABLISHED YELLOWSTONE National Park—the world's first "national park," more than two million acres located mostly in the northwest corner of present-day Wyoming—to be preserved and managed by the federal government for the enjoyment and benefit of the people. In the midst of the Gilded Age's rampant exploitation of public lands, the concept of federally managed parks protected from the extractive uses typical of the late-nineteenth-century American West abruptly gained congressional sanction. Yellowstone's awesome natural phenomena had inspired a political phenomenon.

Despite its eventual worldwide implications, the Yellowstone Park Act attracted minimal public attention; Congress only briefly debated the bill, giving little indication of what it intended for the park. The act came during an era when the federal government was aggressively divesting itself of the public domain through huge railroad land grants and, among others, homestead, mining, and timber acts. Although a few Americans were voicing concern about the preservation of nature and decrying the exploitation of natural resources, no broad, cohesive conservation movement existed in 1872. Yet the proposal to save the wonders of Yellowstone (principally the great falls of the Yellowstone River and the spectacular geysers) triggered legislation creating what was until very recently the largest national park in the contiguous forty-eight states.

The origin of the national park idea—who conceived it, and whether it was inspired by altruism or by profit motives—has been disputed. One account became a revered part of national park folklore and tradition: that the idea originated in September 1870 during a discussion around a campfire near the Madison Junction, where the Firehole and Gibbon rivers join to form the Madison River in present-day Yellowstone National Park. Nearing the conclusion of their exploration of the Yellowstone country, members of the Washburn-Doane Expedition (a largely amateur party organized to investigate tales of scenic wonders in the area) had encamped at Madison

Junction on the evening of September 19. As they relaxed and mused around their wilderness campfire, the explorers recalled the spectacular sights they had seen. Then, after considering the possible uses of the area and the profits they might make from tourism, they rejected the idea of private exploitation. Instead, in a moment of high altruism, the explorers agreed that Yellowstone's awe-inspiring geysers, waterfalls, and canyons should be preserved as a public park. This proposal was soon relayed to high political circles, and within a year and a half Congress established Yellowstone Park.

Through the decades, as the national park concept gained strength and other nations followed the American example, the Madison Junction campfire emerged as the legendary birthplace not just of Yellowstone but of all the world's national parks. Although the Yosemite Valley had been established as a California state park from federally donated lands in 1864 and the term "national park" had been occasionally used in the past, the belief that the national park idea truly began around a wilderness campfire at the Madison Junction evolved into a kind of creation myth: that from a gathering of explorers on a late summer evening in the northern Rocky Mountains came the inspiration for Yellowstone National Park, the prototype for hundreds of similar parks and reserves around the world. In the wilderness setting and with a backdrop of the vast, dramatic landscape of the western frontier, the origin of the national park idea seemed fitting and noble. Surely the national park concept deserved a "virgin birth"—under a night sky in the pristine American West, on a riverbank, and around a flaming campfire, as if an evergreen cone had fallen near the fire, then heated and expanded and dropped its seeds to spread around the planet.

THE CAMPFIRE STORY MAY BE SEEN IN ANOTHER LIGHT, however. Romantic imagery aside, the element of monopolistic business enterprise is notably absent from the traditional campfire story—the profit motive obscured by the altruistic proposal for a public park. In fact, corporate involvement with America's national parks has its roots in that same Washburn-Doane Expedition and campfire discussion. Amid the great rush to settle the West after the Civil War, the Northern Pacific Railroad Company was by 1870 planning to extend its tracks from the Dakota Territory across the Montana Territory. With easiest access to Yellowstone being from the north, through Montana, the company believed that once it extended its tracks west it could monopolize tourist traffic into the area.

Alert to this potential, Northern Pacific financier Jay Cooke took special interest in the scenic Yellowstone country. In June 1870 he met in Philadelphia with Nathaniel P. Langford, politician and entrepreneur, who subsequently proceeded to Montana and, with Northern Pacific backing, successfully promoted the Washburn-Doane Expedition. This exploration of Yellowstone began in August, with Langford as a participant. Still supported by the Northern Pacific, Langford followed up the expedition with lectures to audiences in Montana and in East Coast cities, extolling the wonders of Yellowstone, while local boosters in Montana began promoting the park idea. The following year, the railroad company subsidized artist Thomas Moran's participation in the expedition into Yellowstone led by geologist Ferdinand V. Hayden. Moran's sketches from the Hayden expedition (his impressive paintings were not yet completed) were displayed in the Capitol in Washington as part of the campaign to enact the Yellowstone legislation.

Ever advancing Northern Pacific interests, Jay Cooke sought to ensure that the Yellowstone country did not fall into private hands, but rather remained a federally controlled area. He observed in October 1871, just before the legislation to create a park was introduced, that a government "reservation" (or park) would prevent "squatters and claimants" from gaining control to the area's most scenic features. Government control would be easier to deal with; thus, it was "important to do something speedily" through legislation.

Subsequent to the Hayden Expedition, the Northern Pacific lobbied for the park with swift success: the Yellowstone bill was introduced on December 18, 1871, and enacted the following March. Like most future national parks, Yellowstone remained under the jurisdiction of the Department of the Interior, which managed the public lands of the West. The park's immense size came not because of an effort to preserve vast tracts of undisturbed wilderness, but largely as a result of recommendations by Ferdinand Hayden, who sought to include the lands most likely to contain spectacular thermal features.

From the first, then, the national parks served corporate profit motives, the Northern Pacific having imposed continuous influence on the Yellowstone park proposal, beginning even before the 1870 expedition that gave birth to the campfire tradition. With their land grants stretching across the continent, American railroads were already seeking to establish monopolistic trade corridors. By preventing private land claims and limiting competition for tourism in Yellowstone, the federal reservation of the area served, in effect, as a huge appendage to the Northern Pacific's anticipated monopoly across southern Montana Territory.

Indeed, in historical perspective, the 1872 Yellowstone legislation stands as a resounding declaration that tourism was to be important in the economy of the American West. A mat-

Although extensive manipulation and intrusion took fundamentally the national park idea embraced the concept of Nature—a remarkable reversal from the treatment of natural

ter of considerable consequence in the Yellowstone story, the collaboration between private business and the federal government fostered a new kind of public land use in the drive to open the West.

Growth of the National Park Concept

Characteristically, the national parks featured outstanding natural phenomena: Yellowstone's geysers, Sequoia's and General Grant's gigantic trees, and Hot Spring's thermal waters. Such features greatly enhanced the potential of the parks as pleasuring grounds that would attract an increasingly mobile American public interested in the outdoors. Writing about Yellowstone in 1905, more than three decades after its establishment as a park, President Theodore Roosevelt observed that the preservation of nature was "essentially a democratic movement," benefiting rich and poor alike. Even with the prospect of monopolistic control of tourist facilities, the national park idea was a remarkably democratic concept. The parks would be open to all—the undivided, majestic landscapes to be shared and enjoyed by the American people.

Moreover, in preventing exploitation of scenic areas in the rapacious manner typical for western lands in the late nineteenth century, the Yellowstone Park Act marked a truly historic step in nature preservation. The act forbade "wanton destruction of the fish and game" within the park, and provided for the

> *preservation, from injury or spoilation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their* retention in their natural condition *(emphasis added).*

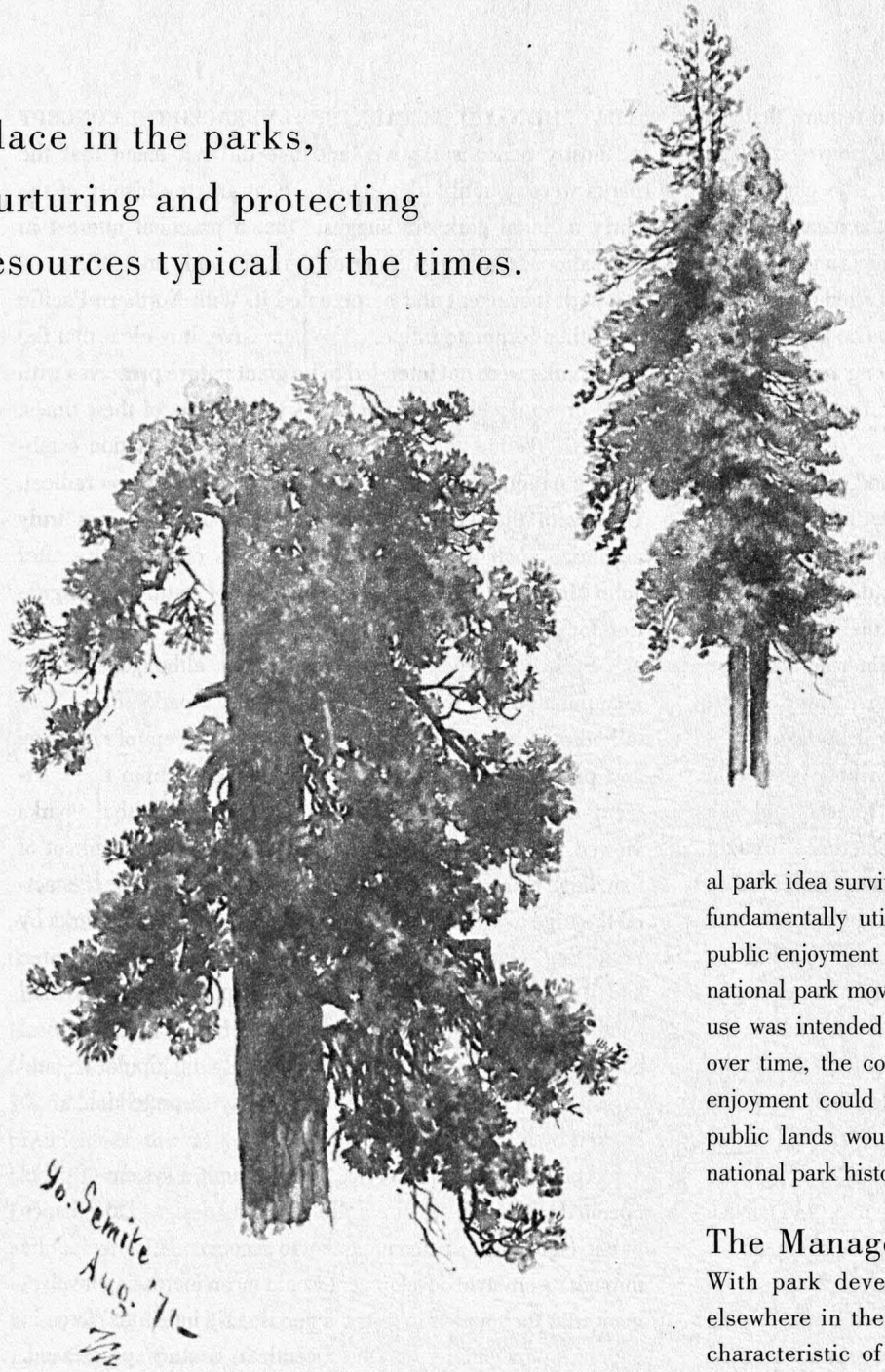
Natural resources in Yellowstone and subsequent national parks were to be protected—by implication, the sharing would extend beyond the human species to the flora and fauna of the area. Indeed, this broad sharing of unique segments of the American landscape came to form the vital core of the national park idea, endowing it with high idealism and moral purpose as it spread to other areas of the country and ultimately around the world.

Toward the end of the nineteenth century, an emerging interest in protecting wilderness was apparent in national park affairs. In the mid-1880s, the congressional defeat of proposals by railroad and mining interests to build a railroad through northern Yellowstone and reduce the park in size underscored the importance of both the park's wildlife and its wild lands—thus moving beyond the original, limited concern for specific scenic wonders of Yellowstone. Interest in more general preservation within the parks also was evident with the creation of Yosemite National Park in 1890, which included extensive and largely remote lands surrounding the Yosemite Valley. John Muir, a leading spokesman for wilderness, sought to preserve the High Sierra in as natural a state as possible and was especially active in promoting the Yosemite legislation. For the new park, Muir envisioned accommodating tourism in the Merced River drainage (which encompasses the Yosemite Valley), while leaving the Tuolumne River drainage to the north (including the Hetch Hetchy Valley) as wilderness, largely inaccessible except on foot or by horseback.

With the early national park movement so heavily influenced by corporate tourism interests such as the railroad companies, Muir's thinking regarding Yosemite and other parks stands out as the most prominent juncture between the park movement and intellectual concerns for nature's intrinsic values and meanings, as typified by the writings of Ralph Waldo Emerson and Henry David Thoreau. Moreover, except perhaps for Muir's efforts to understand the natural history of California's High Sierra, the advances in ecological knowledge taking place by the late nineteenth century had little to do with the national park movement. Busy with development, the parks played no role in leading scientific efforts such as the studies of plant succession by Frederic Clements in Nebraska's grasslands, or by Henry C. Cowles along Indiana's Lake Michigan shoreline. Once national parks became more numerous and more accessible, an ever-increasing number of scientists would conduct research in them. But within national park management circles, awareness of ecological matters lay in the distant future, and genuine concern in the far-distant future.

In many ways, the national park movement pitted one utilitarian urge—tourism and public recreation—against another—the consumptive use of natural resources, such as logging, mining, and reservoir development. In the early decades of

place in the parks, nurturing and protecting resources typical of the times.



field studies of Yosemite conifers, 1871, by Thomas Moran

national park history, the most notable illustration of this conflict came with the controversy over the proposed dam and reservoir on the Tuolumne River in Yosemite's Hetch Hetchy Valley. The vulnerability of this national park backcountry, which John Muir wanted preserved in its wild condition, was made clear when Congress voted in December 1913 to dam the Tuolumne in order to supply water to San Francisco. Even though located in a national park, the Hetch Hetchy Valley was vulnerable to such a proposal in part because it was indeed wilderness, undeveloped for public use and enjoyment. The absence of significant utilitarian recreational use exposed the valley to reservoir development, a far more destructive utilitarian use.

This relationship Muir recognized; he had already come to accept tourism and limited development as necessary, and far preferable to uses such as dams and reservoirs. Yet the extensive, unregulated use of the state-controlled Yosemite Valley alerted Muir and his friends in the newly formed Sierra Club to the dangers of too much tourism development (and provided impetus for adding the valley to the surrounding national park in 1906). Still, the national park idea survived and ultimately flourished because it was fundamentally utilitarian. From Yellowstone on, tourism and public enjoyment provided a politically viable rationale for the national park movement; concurrently, development for public use was intended from the very first. Becoming more evident over time, the concept that development for public use and enjoyment could foster nature preservation on large tracts of public lands would form an enduring, paradoxical theme in national park history.

The Management of Nature

With park development simulating resort development elsewhere in the country, perhaps the most distinguishing characteristic of the parks was their extensive, protected backcountry. The location of roads, trails, hotels, and other recreational tourism facilities only in selected areas meant that much of the vast park terrain escaped the impact of intensive development and use. Offering the only real possibility for preservation of some semblance of natural conditions, these relatively remote areas would constitute the best hope of later generations seeking to preserve national park ecological systems and biological diversity.

In contrast to tourism development, no precedent existed for intentionally and perpetually maintaining large tracts of land in their "natural condition," as stipulated in the legislation creating Yellowstone and numerous subsequent parks. (The 1916

act creating the National Park Service would require that the parks be left "unimpaired"—essentially synonymous with maintaining "natural conditions.") Moreover, the early mandates for individual parks were not so much the ideas of biologists and other natural scientists, but of politicians and park promoters. There seems to have been no serious attempt to define what it meant to maintain natural conditions. The key mandate for national park management began (and long remained) an ambiguous concept related to protecting natural scenery and the more desirable flora and fauna.

Management of the parks under the mandate to preserve natural conditions took two basic approaches: to ignore, or to manipulate. Many inconspicuous species (for example, small mammals) were either little known or of little concern. Not intentionally manipulated, they carried on their struggle for existence without intentional managerial interference. The second approach, however, involved extensive interference. Managers sought to enhance the parks' appeal by manipulating the more conspicuous resources that contributed to public enjoyment, such as large mammals, entire forests, and fish populations. Although this manipulation sometimes brought about considerable alteration of nature (impacting even those species of little concern), park proponents did not see it that way. Instead, they seem to have taken for granted that manipulative management did not seriously modify natural conditions—in effect, they defined natural conditions to include the changes in nature that they deemed appropriate. Thus, the proponents habitually assumed (and claimed) that the parks were fully preserved.

THE TREATMENT OF NATURE IN THE EARLY NATIONAL parks set precedents that would influence management for decades. Later referred to as "protection" work, activities such as combating poaching and grazing, fighting forest fires, killing predators, and manipulating fish and ungulate populations constituted the backbone of natural resource management. These duties fell to army personnel in parks where the military was present and ultimately, in all parks, to the field employees who were becoming known as "park rangers." As their efforts to curtail poaching and livestock grazing required armed patrol, the rangers rather naturally assumed additional law-enforcement responsibilities. In addition, they assisted the park superintendents by performing myriad other tasks necessary for daily operation of national parks, such as dealing with park visitors and with concessionaires. Deeply involved in such activities, the park rangers were destined to play a central role in the evolution of national park management.

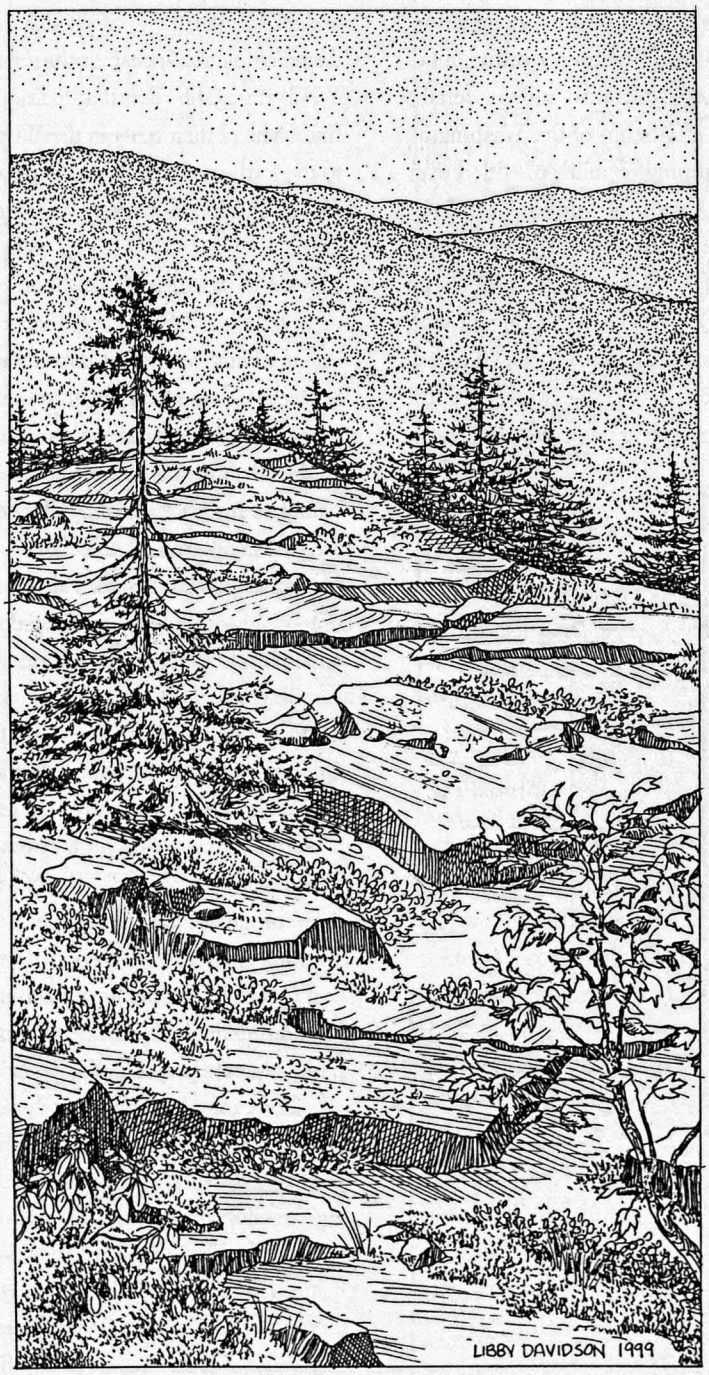
THAT THE NATIONAL PARK IDEA EMBRACED THE CONCEPT of mostly nonconsumptive land use did not mean that the parks were nonutilitarian. On the contrary, the history of the early national park era suggests that a practical interest in recreational tourism in America's grand scenic areas triggered the park movement and perpetuated it. With Northern Pacific and other corporate influence so pervasive, it is clear that the early parks were not intended to be giant nature preserves with little or no development for tourism. Products of their times, the 1872 Yellowstone Act and subsequent legislation establishing national parks could not be expected to be so radical. Only with the 1964 Wilderness Act would Congress truly authorize such preserves—three-quarters of a century after John Muir had advocated a similar, but not statutory, designation for portions of Yosemite.

Still, it is important to recognize that, although extensive manipulation and intrusion took place in the parks, fundamentally the national park idea embraced the concept of nurturing and protecting nature—a remarkable reversal from the treatment of natural resources typical of the times. Yet with the parks viewed mainly as scenic pleasuring grounds, the treatment of fish, large mammals, forests, and other natural resources reflected the urge to ensure public enjoyment of the national parks by protecting scenery and making nature pleasing and appealing; and it was development that made the parks accessible and usable. Even with legislation calling for preservation of natural conditions, park management was highly manipulative and invasive. "Preservation" amounted mainly to protection work, backed by little, if any, scientific inquiry.

The National Park Service would inherit a system of parks operated under policies already in place and designed to enhance public enjoyment. The commitment to accommodating the public through resort-style development would mean increasing involvement with the tourism industry, a persistently influential force in national park affairs as the twentieth century progressed. Management of the parks in the decades before the advent of the National Park Service had created a momentum that the fledgling bureau would not—and could not—withstand. ☾

Richard West Sellars *is a historian with the National Park Service in Santa Fe, New Mexico. Currently, he is preparing a history of cultural resource management in the National Park System during the twentieth century—a companion study to* Preserving Nature in the National Parks: A History, *which won Eastern National's Authors Award for 1997.*

Walk Softly and Carry a Big Map



from *Wetland, Woodland, Wildland*

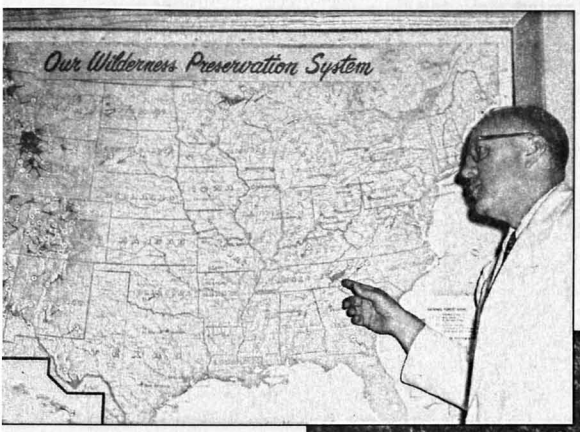
Historical Roots of Wildlands Network Planning

by Ed Zahniser

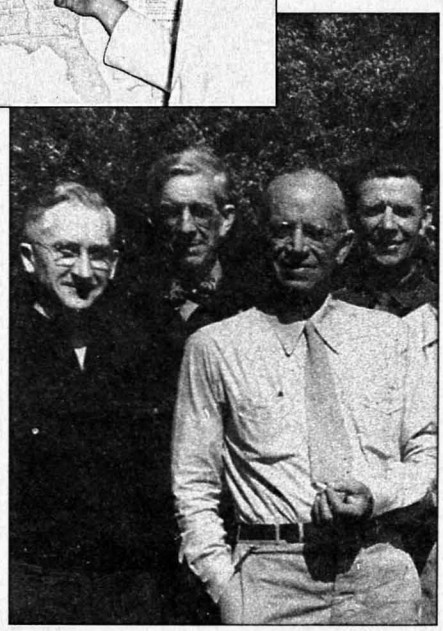
The earliest reference I know to a "wildlands project" is the proposed legislation cobbled together by Benton MacKaye and my father, Howard Zahniser, in 1946. MacKaye was then president of the 11-year-old Wilderness Society. My father had been on board as executive secretary and editor of the Society's magazine, *The Living Wilderness*, for less than a year when their proposal was drafted. Their hopeful announcement appeared in the September issue of the magazine: "To establish a national system of wildland belts is the purpose of a bill that The Wilderness Society is expecting to sponsor for introduction at the next session of Congress. A proposed draft is being circulated among conservationists in order to obtain advice that will lead to its improvement and enactment" (Zahniser 1946). At its core the bill called on the federal government to "preserve for the information and inspiration of posterity representative areas of our country in a primitive condition, and to foster a deeper appreciation of the natural features of the earth which are characteristic of the United States" (Zahniser 1946).

boreal outcrop by Libby Davidson

The deaths of Wilderness Society organizer Robert Marshall in 1939 and then of its only staff member Robert Sterling Yard in 1944 had resulted in a fundamental refocusing of the Society. Meeting in mid-1945 the organization's governing body decided to expand as a membership organization. Olaus J. Murie was hired as half-time director operating out of Moose, Wyoming, and "Zahnie," as friends and associates called my father, ran day-to-day affairs out of the Washington office. In 1946 the Society's governing council, presided over by MacKaye, voted to pursue some sort of wilderness legislation and introduced the proposal in March of that year. A photo on page five of the spring issue of *The Living Wilderness* shows my father presenting the Society's proposal to Congressman Daniel K. Hoch of Pennsylvania, "because of his long advocacy of trails and wildlands for recreation" (Zahniser 1946). (That my father was a native Pennsylvanian might also have figured in the occasion.)



Howard Zahniser (executive secretary of The Wilderness Society) and his "big map" during the campaign to pass federal legislation that would create the National Wilderness Preservation System. The bill passed in 1964.



Benton MacKaye (second from left) at a 1946 Governing Council meeting of The Wilderness Society along with (left to right) Harvey Broome, Aldo Leopold, and Olaus Murie.

It was an enthusiastic shot at wilderness legislation, but its proponents did not appreciate how much groundwork any national program to preserve wildlands would require. Their bill went nowhere, perhaps because, unlike the Wilderness bills beginning a decade later, the proposed federal wildland project was not designed as a response to the increasing number of motor cars. While it may be clear that today's wildlands conservation efforts find some of their roots in the Wilderness Act, we must also look to the earlier efforts of MacKaye and my father—and their conservation-minded predecessors—to get a more complete view.

BENTON MACKAYE GETS A BAD RAP IN BILL BRYSON'S recent book *A Walk in the Woods: Rediscovering America on the Appalachian Trail.* Bryson characterizes MacKaye's visionary schemes as "ambitious, unworkable proposals that were read with amused tolerance and promptly binned" (Bryson 1998). Of course Bryson was hiking on a MacKaye scheme to make the matter of his book. Admittedly, however, the Appalachian Trail idea seemed unworkable when first proposed in 1921. But MacKaye's vision inspired decades and decades of heroic volunteerism—which continues today—to establish and maintain a footpath from Georgia to Maine.

Bryson's portrait seems colored, in part, by the fact of MacKaye's attachment to the 1930s New Deal brain trust. That group is now often caricatured as starry-eyed at best. But, as the late T. H. Watkins recently said of the New Deal, it was a great period of "government in a covenant of responsibility with the people and to the land." "The New Dealers did more to rattle the cage of government" than any other group in our history, Watkins said, and the period showed "a nobility of conscience that few governments have ever attained" (Watkins 1999). This high-minded ethos provides an important lens on the sweeping, national-scale projects of this period.

For example, it fascinates me that Benton MacKaye, certainly one of the inventors of the discipline of regional planning, prophesied two phenomena that would today seem inimical to one another: the Appalachian Trail and the Interstate Highway System. And yet it is worth considering how these two American institutions might together model, admittedly over the long haul, the workability of today's continental wildlands efforts, such as The Wildlands Project and The Wilderness Society's Network of Wildlands program. The Appalachian Trail—as conceived by MacKaye—symbolizes wildlands connectivity. The Interstate Highway System models the gargantuan scale of national will required to carry it out.

In addition to scale, the 1946 proposal for a federal wildlands project presages current landscape-level conservation

photos courtesy Ed Zahniser

efforts in its specific call for both mountain and river wilderness belts. Along some reaches of the Appalachian Trail, the footpath is indeed now the backbone of substantial designated Wilderness and culminates, at its northern end, in Percival Baxter's privately assembled state park wilderness. A start on the river corridors has been made through the National Wild and Scenic Rivers System and, perhaps, also by the more recent rails-to-trails projects and the largely riparian national industrial heritage corridors.

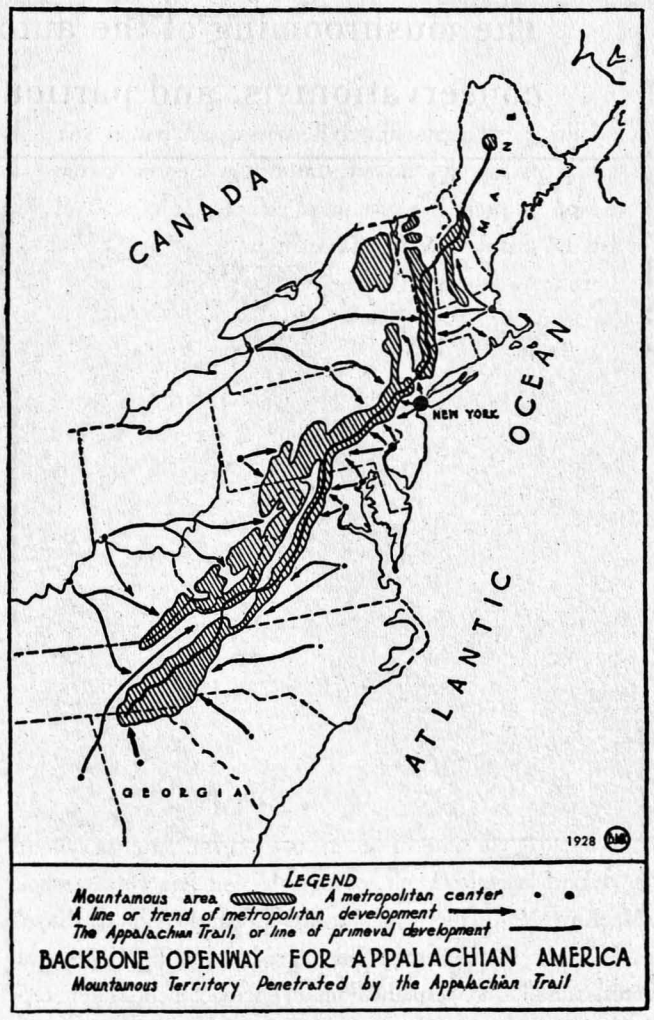
By 1948 MacKaye was also calling for study of local "wildland patches" through the pages of *The Living Wilderness.* "What are the chances in your neighborhood...regarding the protection of small areas of ridge, marsh, intervale, and other wildland patches." MacKaye urged everyone to "gather a crew and explore your bailiwick for a wildland area (some secret stream or marsh or ridge) and then seek some local means for getting it preserved" (MacKaye 1948).

That language reveals MacKaye's original intent for the Appalachian Trail. As he speechified to the Appalachian Trail Conference in 1935, in his dramatic, almost stentorian manner, "The Appalachian Trail as originally conceived is not merely a footpath *through* the wilderness but a footpath *of* the wilderness" (MacKaye 1935). The Appalachian Trail would keep wilderness and its influence accessible to the exploding eastern megalopolis that MacKaye also foresaw—and wished to forestall. MacKaye wanted a continuum of the primeval to the communal to the urban. And "wilderness belts" were part of his scheme for squelching what he called "metropolitan flow" or "metropolitan invasion" (MacKaye 1990). We call it urban sprawl now.

He wrote:

> *The mountains represent the..."primeval environment." And this is the seed of the whole indigenous environment: for the communal derives from the primeval and the urban from the communal. So the camp fire is our primal "home." But the metropolitan environment is no portion of our home. It is a thing exotic which does not "belong." It is a product of the "over-civilized." The indigenous is the atmosphere of the home ideal—or the innate, the permanent, and the complete: the metropolitan is the atmosphere of ideals astray—or the exotic, the temporary, the unbalanced, and the distorted. One is complete: the other is partial and makeshift.* (MacKaye 1990)

Wilderness belts were intended to keep this primal home accessible as an influence on the entire spectrum of human interactions with Nature. In short, a wildlands project or network.

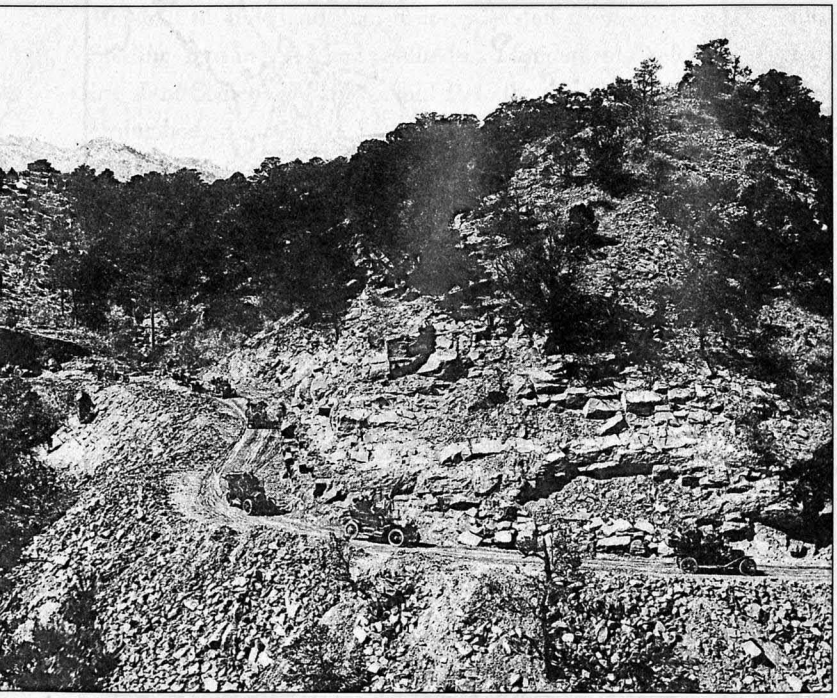


MacKaye's big vision of a footpath through (and of) the wilderness—the Appalachian Trail.

MacKaye recognized the rapidly approaching megalopolis. He warned, "The coming of the industrial revolution (within a century), precipitating as it has the metropolitan flood (within a generation), marks another 'overnight event' in history's perspective" (MacKaye 1990). He had taken from Oswald Spengler the distinction between growth (in culture) and expansion. The latter we would denigrate as growth for growth's sake, what Edward Abbey called "the ideology of the cancer cell." MacKaye's antidote—what we now call wildness—was "to advance the growth of an all-sided culture" and "to hold in check the flow and expansion of a one-sided civilization" that he viewed as "the iron glacier" (MacKaye 1990).

Therefore, for MacKaye, preserving wilderness and wildness—the primeval—had overt and immediate social implications. The job of MacKaye's "new explorer," he wrote, was "to 'wage' a determined visualization...he must speak softly and carry a big map." (MacKaye would have gone bonkers over GIS mapping technology.) The broadest goal of the new explorer was "to reveal within our innate country, despite the fogs and chaos of cacophonous mechanization, a land in which to live..."

The mushrooming of the automobile culture by the 1950s forced conservationists, and particularly The Wilderness Society and Sierra Club, to focus on stopping the willy-nilly roading of the last great expanses of wilderness on federal public lands.



(MacKaye 1990). More specifically, we can look to MacKaye's call for maps as conservation tools, his valuing of primeval forests, and his concern about urban encroachment as key steps toward the current strategies in conservation biology.

MacKaye's influence extended beyond his profession and historical moment. Lewis Mumford called MacKaye's *The New Exploration: A Philosophy of Regional Planning*, "a book that deserves a place on the same shelf that holds Henry Thoreau's *Walden* and George Perkins Marsh's *Man and Nature*...." Mumford also said that, like *Walden*, MacKaye's book "had to wait a whole generation to acquire the readers that would appreciate it"[1] (MacKaye 1990).

MacKaye's influence was great in the collective thinking of The Wilderness Society from its founding well into the 1950s, and his imprint is clear in the early, prototypic vision of a wildlands project. Unfortunately, his vision of creating regional wildlands networks would not soon become the organizing principle of the conservation movement. The mushrooming of the automobile culture by the 1950s forced conservationists, and particularly The Wilderness Society and Sierra Club, to focus on stopping the willy-nilly roading of the last great expanses of wilderness on federal public lands. Some ten years after MacKaye and Zahnie floated their federal wildlands project legislative proposal, the first iteration of the wilderness bill that would become the 1964 Wilderness Act was introduced in Congress. Its goal was statutory protection of Wilderness Areas on federal lands. By then, post-World War II prosperity had unleashed pent-up forces of consumption stifled since the Great Depression. MacKaye's iron glacier was advancing on the formerly remote reaches of the United States via the increasingly ubiquitous motor car.

Benton MacKaye supported the big wilderness protection thrust of the American conservation movement when it came. He had recognized as early as his 1930 article "The Townless Highway" that,

> *...the nineteenth-century American, though ideologically a complete individualist, had, as a fact of daily experience, the environment of community; he had also the environment of the open spaces—the forest on the mountain, the field by the wayside, or easy access to the open sea. All these primary types of environments are now in danger of extinction; the community and the open wayside are both on the point of being overwhelmed and obliterated by the present-day uncontrolled migration led by the motor car.* (MacKaye 1990)

It is too bad that the proposed 1946 federal wildlands project could not have proceeded cheek by jowl with the 1964 Wilderness Act. As Eric Freyfogle points out:

> *By the 1990s, Congress had designated 100 million acres of wilderness, yet it had no real vision of how wilderness preservation might fit into a larger environmental policy or plan. Wilderness preservation became a hodgepodge process, with some lands set aside while oth-*

1. In MacKaye's own mind his *magnum opus*, never published, was the book manuscript he titled "Geotechnics," which I read in 1969 as Paul Oehser and Lewis Mumford were trying to find a publisher for it. The word *geotechnics* had been coined by the Scotsman Patrick Geddes, whom MacKaye met in 1923. To Geddes it meant the arts of modeling and transforming the Earth. It came to mean "the science of habitability" for MacKaye.

photo: early automobile recreation in the West, ca. 1912 (courtesy Colorado Historical Society)

ers were freed for intensive development. The message conveyed, sometimes overtly, was that preservation of particular lands justified degradation of other lands. In an almost tit-for-tat mentality, wilderness areas, it seemed, could exist—and would have to exist—as pockets of little-touched nature in a deteriorating landscape, with their boundaries alone protecting them. (Freyfogle 1998)

Freyfogle obviously wishes, as MacKaye had counseled, that we had carried a much bigger map while walking softly toward the Wilderness Act of 1964.

Other moves to save a coherent system of ecologically representative natural areas, if not necessarily a connected system of wildlands, had been afoot in the 1920s and 1930s. The more one dips into the literature of this period, the more it becomes apparent that, had we listened to any number of the land scientists of that day—and also pursued big wilderness protection as we did—the nation might well be close to realizing a coherent system of protected wildlands.[2] But even in these early efforts we see the specter of the automobile. As R. Edward Grumbine writes: "What sparked this outcry from a few leading scientists?...it resulted from a massive upsurge in road building on public lands by both the Forest Service and Park Service between 1916 and 1921" (Grumbine 1997).

EARLIER THAN BENTON MACKAYE, BIOLOGIST VICTOR Shelford was developing the ideas that were precursors to contemporary conservation planning. He was the linchpin of one of the most ambitious proposals to protect ecologically representative samples of the whole of the North American continent and parts of Central and South America as well. In 1920, writing in the *Transactions of the Illinois State Academy of Science*, Shelford amassed a compendium of calls for the preservation of "areas of natural conditions in North America." Shelford's article, "Preserves of Natural Conditions," quotes Joseph Grinnell, Tracey Storer, Robert Griggs (who would serve on the governing council of The Wilderness Society), Francis Sumner, H.C. Cowles, and several other scientists on the need to preserve areas in (and for) their natural conditions. Shelford also looked outside the scientific fold to literary sources for his defense of natural areas. He quotes William Cullen Bryant's poem "Prairies" and asks, "Where will [future] students expect to find the source of the poet's inspiration?" (Shelford 1920).

Shelford framed these various arguments for preserves with his own assertion that,

The nation has preserved certain areas as national parks, national monuments, national forests, etc., for the use of the nation as a whole. The states have reserved some similar areas. The humblest citizen has a right to the recreation values of the bodies of water near his home, and his children should be able to wade in a nearby stream and pick up stones without danger to health. The day is past, even in America, when population is so small and resources so great that these general interests can be sacrificed for the profit of a small group of citizens. (Shelford 1920)

Shelford wrote that 80 years ago.

Born in 1877, Shelford was an animal and community ecologist who studied at the University of Chicago with Henry C. Cowles, and wrote substantively on Cowle's great interest, vegetational or "ecological succession." In 1913 Shelford published what is considered one of the monumental ecological works, *Animal Communities in Temperate America*. He founded the Ecologists Union in 1946 (later to become The Nature Conservancy) and helped organize the Ecological Society of America, serving as its first president in 1915.

In 1933 Shelford wrote "The Preservation of Natural Biotic Communities" in *Ecology* (Vol. XIV, No. 2) in his capacity as chairman of the Committee for the Study of Plant and Animal Communities of the Ecological Society of America, the journal's publisher. In the article he develops and describes a classification for "Nature Sanctuaries or Nature Reserves" (Shelford 1933). He writes, "The whole trend of research and education is toward specialization on particular objects or particular organisms. These are stressed while the assemblage of which they belong is ignored or forgotten, together with the fact that they are to be regarded as integral parts of the system of nature" (Shelford 1933). He laments the lack of a "tendency towards the development of specialists on the entire life of natural areas" (Shelford 1933).

Recognizing a need—echoed later in MacKaye's "big map" vision and today's wildlands network efforts—Shelford called for "buffer areas of partial protection" outside the core preserves of natural conditions. These were to buffer "the roaming animals" and fire—still the forest enemy then. The nature sanctuary, he writes, "necessitates buffering and noninterference by man." Going farther, Shelford recognized that "biologists are beginning to realize that it is dangerous to tamper with nature by introducing plants and animals, or by destroying predatory ani-

2. R. Edward Grumbine referred to a number of these proponents in his article "Using Biodiversity as a Justification for Nature Protection in the US" in *Wild Earth* (Winter 1996/1997, pages 71–80).

mals or by pampering herbivores." He defines a buffer area as "a region surrounding a Nature Sanctuary in which the biotic community, especially the vegetation, is only slightly modified by man. It is a region of partial protection of nature and may be zoned to afford suitable range for roaming animals under full protection" (Shelford 1933).

"The reserved areas in the National Parks are possibly too small, but in any event should be zoned about by (buffer) areas of complete or partial protection of the roaming animals," Shelford writes (1933). He also recognizes that "areas should not be fenced against any of the larger native animals, as their presence is necessary to make the conditions natural as regards, vegetation, etc." The major practical upshot of Shelford and his Ecological Society of America colleagues, in Grumbine's view, was the creation of the Forest Service Research Natural Areas program (Grumbine 1997). For those interested in certain congruences of language between the National Park Service Organic Act of 1916, the Forest Service regulations for roadless and primitive areas, and the Wilderness Act of 1964, Shelford's writings are peppered with "natural conditions," "unmodified," "primeval," "pristine," and the implied question of whether Nature can be "improved" by human agency. For today's wildlands advocate, here is grist for the mill and inspiration for the present task. Here is historical motivation for today's visionary projects.

CERTAINLY BENTON MACKAYE'S VISION PROFITED BY HIS lifelong close attention to Thoreau's ideas. He wrote that "Thoreau is the philosopher of environment: he saw the eternities of the indigenous, and he foresaw the inroadings of the metropolitan" (MacKaye 1990). (Notice MacKaye's early use of the word environment here in 1928.) H. Daniel Peck writes that Thoreau "demonstrates his certain knowledge that the natural world could be permanently damaged by industrial and technological forces" (Peck 1990).

Thoreau penned one of our first laments of the irony of private riparian lands and the reduction of our commons to the mere meeting house when he writes, "we shall get our only view of the stream from the meeting house belfry." Instead, Thoreau proposes, "They who laid out the town should have made the river available as a common possession forever....Indeed I think that not only the channel but one or both banks of every river should be a public highway—for a river is not useful merely to float on." Thoreau's thinking has been flowing into conservation history ever since. For example, MacKaye's 1946 federal wildland project proposed to mount the uphill battle of making river corridors, functionally at least, "a common possession forever" (Zahniser 1946).

Before 1860, in his essay "Huckleberries," Thoreau wrote, "if the people of Massachusetts are ready to found a professorship of Natural History—so they must see the importance of preserving some portions of nature herself unimpaired." Two paragraphs later he observed, "I think that each town should have a park, or rather a primitive forest, of five hundred or a thousand acres, either in one body or several—where a stick should never be cut for fuel—nor for the navy, nor to make wagons, but stand and decay for higher uses—a common possession forever, for instruction and recreation" (Thoreau 1980).

Today, we need to make Thoreau's prescription real and to provide connections between such pockets of wildness and larger protected natural areas, parks, and designated Wilderness. It is fair to argue that the 1916 Organic Act of the National Park Service, the preserves called for by Victor Shelford, the wilderness proposals of Benton MacKaye and Howard Zahniser, and the 1964 Wilderness Act all owe debts to Thoreau's language of "preserving...unimpaired" swaths of primitive America. For current conservationists working to protect wildlands networks, it is useful—and heartening—to understand the deep roots from which our efforts grow. ☾

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Not only do the Parks contain some of the world's sublimest and most beautiful scenes, but each park is a wild-life reservation, a place where guns are forbidden. Thus protected, these wildernesses will remain forever wild, forever mysterious and primeval, holding for the visitor the spell of the outdoors, exciting the spirit of exploration.

—Enos Mills, from the Preface to *Your National Parks,* 1917

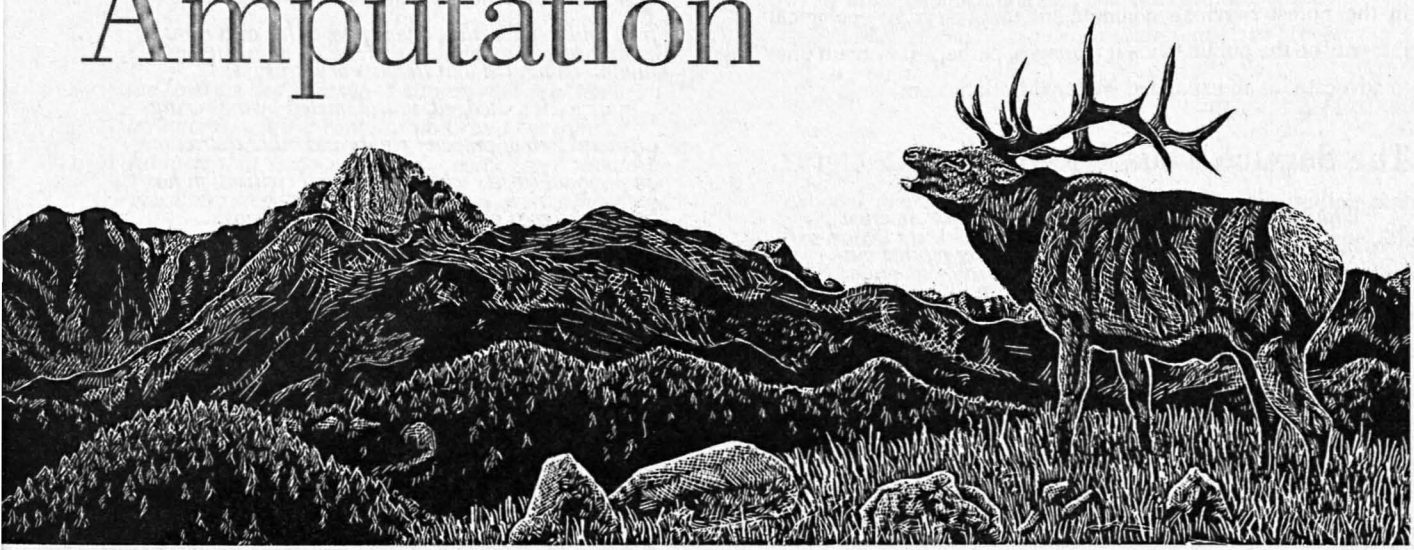
Recently I received a copy of a well-documented economic analysis of national forest logging, which concludes that the Forest Service's timber program loses more than $1.2 billion a year. After reading it, I put the document on my bookshelf next to a General Accounting Office report (1995) about Forest Service logging losses, The Wilderness Society's *Below-cost Timber Sales Conference Proceedings* (1986), economist Randal O'Toole's book *Reforming the Forest Service,* etc. Clearly, the below-cost timber issue—despite having been highlighted by forest activists for many years—has created limited demand for change from either the public or the politicians.

The same might be said about Wilderness. For nearly two decades after passage of the Wilderness Act in 1964, there was significant interest and progress in protecting Wilderness Areas. Wilderness Areas remain extremely popular for primitive recreation; in a few cases, they are receiving so much use that the very values people wish to experience—quiet, solitude, truly wild forests—are being compromised. Despite the popularity of Wilderness, however, there have been few successful Wilderness campaigns over the last 20 years. Wilderness protection has not garnered sustained attention from the general public or changed the way the Forest Service does business.

Reformation Through Amputation

Expanding National Parks by Shrinking National Forests

by David Carle



elk at Long's Peak, Rocky Mountain National Park by Evan Cantor

Other recent forest reform campaigns such as Zero Cut, banning clearcutting, defunding the logging road line-item—all important and worthwhile—have realized only limited success. Yet, there have been times during the last 90 years when the Forest Service has been pressured to substantively change its management activities: the impetus for change occurred when land under the management of the Forest Service was threatened to be transferred to the National Park Service. Recreation programs, designation of primitive and Wilderness areas, and interpretive programs were developed by the Forest Service in apparent response to the growing Park Service presence and expansion.

The history of the National Park Service (NPS) is intertwined with that of the US Forest Service (USFS). Many national parks were created out of national forest land. As a result, a tension between the two agencies has persisted for most of the last century. Historically, conservation organizations have used this tension to their advantage and worked to have land threatened by logging be transferred from the Forest Service to the Park Service (see Table 1). For whatever reason, conservationists have not utilized this strategy in a focused way in recent decades. The last national parks created out of national forest land were North Cascades (1968) and Great Basin (1986).

To be sure, the National Park Service is not a perfect steward of our public lands, but its orientation is fundamentally preservationist, not extractive. Based on its legislative mandate, its broad public support, and with refocused oversight by conservationists, the Park Service is the agency from which we can reasonably expect science-based management that emphasizes biodiversity protection. In most cases, the worst Park Service management is equivalent to the best that one can expect from the Forest Service.

In light of the biodiversity crisis and the lack of confidence in the Forest Service's commitment to preserving ecological integrity on the public lands it manages, perhaps it is again time to advocate for an expanded National Park System.

The Service Thus Established...

> *What a beautiful and thrilling specimen for America to preserve and hold up to the view of her refined citizens and the world, in future ages! A nation's park, containing man and beast, in all the wild and freshness of their nature's beauty!*
>
> —George Catlin, 1831

The first national park, Yellowstone, was created in 1872. The second, Mackinac Island, was accorded national park status in 1875 (then ceded to Michigan in 1895). A number of other well-known areas such as Yosemite and Mt. Rainier became national parks over the next 10–15 years. By 1916, when Congress passed legislation creating the National Park Service, there were 14 national parks.

The Forest Service, established in 1897, did not support the creation of a National Park Service on the grounds that it would be redundant. The Forest Service believed that national forest and national park land management would be similar in philosophy, only vary in degree, "such as less extensive commercial logging in the national parks" (Hays 1987).

Over the objections of the Forest Service, the National Park Service was established by Congress with a mandate to:

> *...regulate the use of...national parks, monuments and reservations...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.* (USC, Title 16, sec. 1)

This mandate is in many ways contradictory. The NPS must preserve Nature, but also must provide opportunities for people to experience their public lands. Despite the paradox, the national parks harbor some of the most intact ecosystems in this country while hosting more than 300 million human visitors a year.

National Parks: Preserving the Primeval

> *One thing which made the deepest impression on me and which I believe to be the most priceless recreational quality of these great reservations, was the sense of freedom and independence which they give. To be free, and to know that one is free, of his own right as human being, without trespass or intrusion ...unfenced, unhedged, untrammeled by the vexing artificial web of property rights and other restrictions on personal liberty which a crowded civilization has built to keep its close-packed life from chaos....*
>
> —Frederick Law Olmsted, 1921

When the Park Service was established, biological understanding was at a different level than today, and one must evaluate the decisions of that era in their historical context. The theme of the times was preserving scenery. But the concept of scenery went beyond the magnificence of the Yellowstone geysers or the Yosemite Valley and included protecting the parks' flora and fauna.

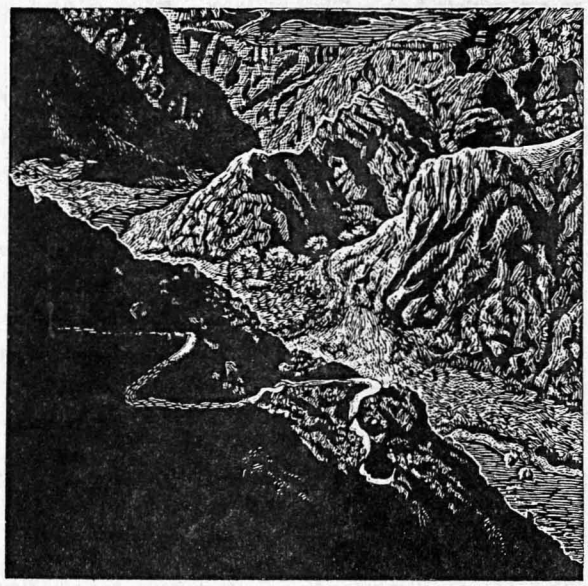


Table 1. ***National Parks that were either created from or expanded by transferring land from the Forest Service to the National Park Service:***

Bryce Canyon	*North Cascades*
Glacier	*Olympic*
Grand Canyon	*Rocky Mountain*
Grand Teton	*Saguaro*
Great Basin	*Sequoia*
Kings Canyon	*Yosemite*
Lassen	

The need to protect natural areas for ecological values was recognized early on as a role for national parks. Dr. Willard Van Name,[1] associate curator of the American Museum of Natural History, concluded (1928):

> *Certainly we should include in the parks the finest and the least spoiled areas that a given region of the country affords, but if it contains no Grand Canyons or Mt. Rainiers that is no reason why every place should be given over to destructive exploitation or why those who have not the time and money to travel long distances should not have such attractive natural scenery as exists in their own part of the country preserved for their enjoyment and for protecting the animals, plants and ecological characteristics of the region for scientific study.... The national parks are the chief hope of retaining any tracts in a natural state.*

In the early Park Service, some agency leaders recognized the ecological necessity of having all wildlife represented in national parks, including predators. "In the preservation of primeval conditions are found the best opportunities to conserve a full complement of living forms. Cutting of timber, grazing, heavy human use, all affect these environmental necessities for living animals" (Cammerer 1938). While this sentiment has not necessarily been consistently implemented, of all federal land managers, the National Park Service offers better representation of nearly complete natural systems on its holdings.

One reason the Park Service may be a bit slow in implementing science-based management is that, compared to the Forest Service, the Park Service has been relatively ignored by the conservation community. Numerous organizations actively work to influence Forest Service management decisions. Very few have been *consistently* involved in monitoring national park management decisions, with the exception being the Sierra Club and Yosemite. One measure of the amount of oversight might be the number of lawsuits against agency management actions. Where the Forest Service is constantly in court for violating wildlife and procedural laws, conservation organizations only rarely take the Park Service to court.

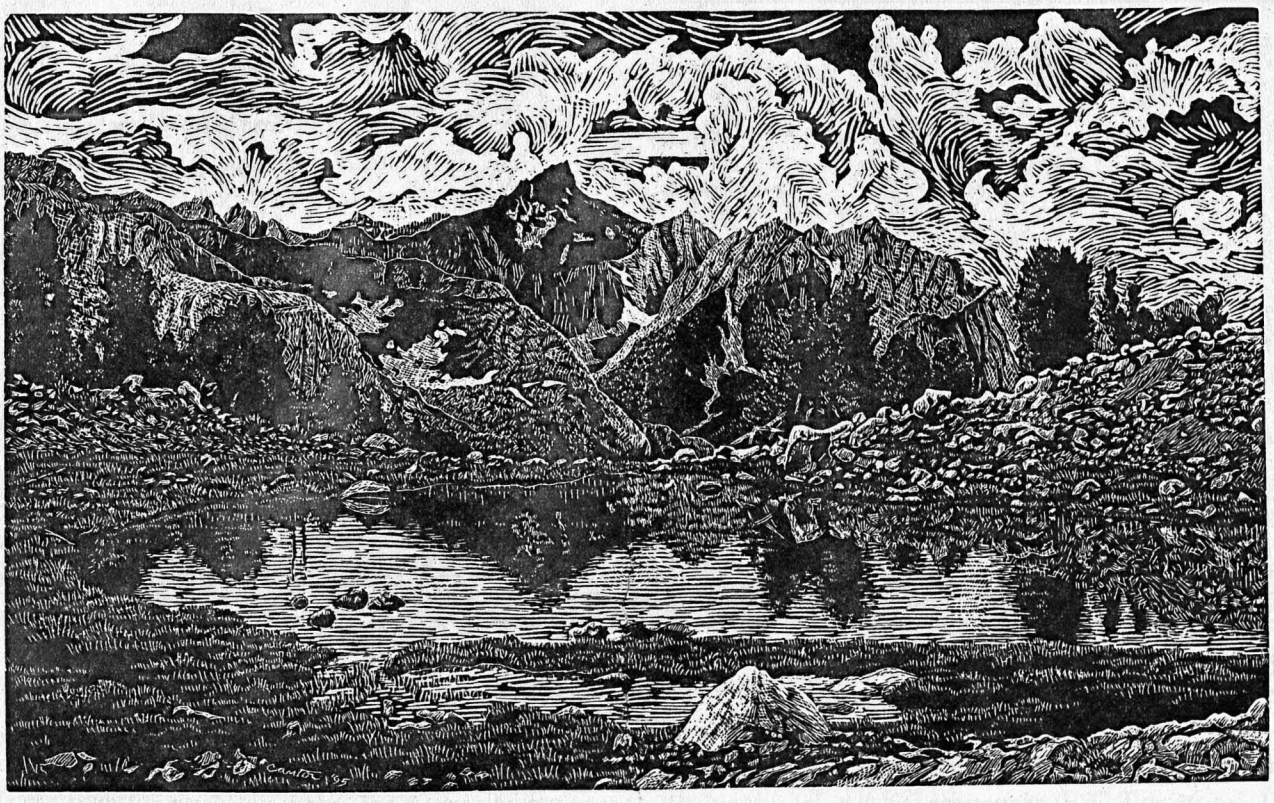
Sibling Rivalry

> *We, also, deplore the hostility and jealousy that exists between the Forest Service and the National Park Service, and the resulting injury to the public and the Parks. We must, however, point out that it is the same kind of mutual misunderstanding that exists between a wolf and a lamb.*
>
> —Rosalie Edge,[2] 1934

In 1916, the Park Service managed 14 national parks and 21 national monuments, comprising more than six million acres (the Forest Service controlled 160 million acres at the time). The bold young leaders of the NPS, Stephen Mather and Horace Albright, began to identify additional areas worthy of national park status. By coincidence, most of these areas were under the control of the Forest Service.

1. Willard Van Name, a biologist at the American Museum of Natural History (NY), was a founder of the conservation organization Emergency Conservation Committee (ECC) and the author of the book, *Vanishing Forest Reserves.* The ECC—an organization of just five people—has been given principal credit for the establishment of Olympic National Park, and played significant roles in the creation of Kings Canyon National Park and in adding lands to Sequoia and Yosemite National Parks.
2. Rosalie B. Edge was an ECC founder and chairperson.

Kaibab Trail and Bright Angel confluence, Grand Canyon National Park by Evan Cantor



In the recently published book, *Creating the National Park Service,* Horace Albright, the first assistant director of the Park Service, states: "I'll admit that [First NPS Director Stephen] Mather and I gave little thought and had less concern when reaching out for their land because we were so philosophically opposed to them. We genuinely believed we were preserving while they were destroying. The antagonism continues to this day" (Albright 1999).

The Forest Service never failed to fight a proposal for a new park whenever its land was involved. From the Park Service's point of view, the Forest Service allowed the "use of anything within their borders: water, minerals, forests, and other commercially attractive enterprises. They allowed hunting, dams, summer homes, and unlimited roads for lumbering. Their beliefs contradicted all of ours" (Albright 1999).

This view of the difference between national parks and national forests was hardly limited to national park staff and advocates. A 1917 editorial in the pro-logging journal *American Forestry* advocated for the protection of national parks, stating that "the desecrating touch of commercialism must not be permitted to defile by unsightly logging, by sheep or cattle grazing, or by power houses and transmission lines the picture of the primitive wilderness...by introducing grazing, logging, and power development to so cheapen and destroy the unique character of our Parks that they will no longer differ from national forests, and the necessity for distinctive management will disappear altogether." While supporting the preservation of national parks, the editorial also paints a clear picture of the activities taking place on national forests at that time. Little has changed.

The rivalry between the two agencies forced the Forest Service to create new initiatives in an attempt to check the momentum of the Park Service. In 1924, the first Forest Service designated "Wilderness Area" was created in the Gila National Forest of New Mexico. Other so-called primitive or "rolling" (not permanent) Wilderness Areas were designated by the Forest Service on other national forests. As the Park Service gained in stature, the Forest Service continually adopted new programs in attempts to derail Park Service expansion.

Challenging the Forest Service

> *The power exists to cut and sell every tree in a national forest. Not only that, but national forests are open to grazing by private stock, to irrigation projects and power dams that ruin lakes and rivers, to every form of commercialism that conflicts with a program of conservation. If the Olympic forests are to be saved, they can be saved only by putting them in a national park.*
>
> —Rosalie Edge, 1934

The Park Service was able to expand its domain by targeting specific areas of national forests with outstanding scenic and cultural value. By putting the Forest Service on the defensive, the Park Service controlled the arena of battle. The Forest

Mt. Clarence King, Kings Canyon National Park by Evan Cantor

Service was placed in the awkward position of having to argue that it was more important to log or mine areas like Bryce Canyon or Cedar Breaks in southern Utah, the sequoias of Kings Canyon, or the Grand Teton Mountains in Wyoming than to preserve them for future generations.

The Park Service also learned to ask for more national forest land than it expected to receive: "Park Service officials would ask for a great deal of land—in many cases more than they really wanted—and settle for a portion of their request. After a few years, they would renew their attempts, acquiring another sizable chunk of the original request" (Rothman 1989).

Of course, fearing that the future of the USFS would be in danger if it continued to lose its land, the Forest Service attempted to fight Park Service expansions. "Park Service success in an area meant a loss of Forest Service prestige, the demise of its recreational policy, and restrictions upon the livelihood of its constituents" (Rothman 1987).

The Strengths of a Modern, Multiple National Park Campaign

> *National parks and reserves are an integral aspect of intelligent use of natural resources. It is the course of wisdom to set aside an ample portion of our natural resources as national parks and reserves, thus ensuring that future generations may know the majesty of the earth as we know it today.*
>
> —John F. Kennedy, 1962

Let us return to the original question: If the present ongoing campaigns, such as ending below-cost timber sales, Zero Cut, banning clearcutting, and designating Wilderness, have resulted in little institutional change, what lessons can we learn from past actions that have initiated meaningful change? The obvious answer seems to be: Now is the time for conservationists to commence a campaign for more national parks by transferring land from national forests. This campaign could be even broader and more strategic than its historical precedents, and build on the following strengths:

■ The campaign will have a very direct, definable, and tangible goal: Expanded public lands under NPS management. New parks, such as the White Mountain, Bankhead, and Siskiyou National Parks, would become the cores of regional wildlands networks.

■ The campaign is positive. Those opposed must take a defensive, anti-national park, anti-wildlife, pro-logging, pro-road-building position.

■ Protecting national parks is protecting our national heritage. National parks are a grand American institution, symbols of a land ethic that the world admires and emulates.

■ A new parks campaign can unite the conservation/preservation community. This issue transcends having to take a position on divisive issues such as banning clearcutting, Zero Cut, roadless areas protection, etc.

■ Many of the newer National Park System units are historic parks in urban centers. We should look carefully at each one to see if there is a way to build green spaces around these sites to create small wildlands recovery areas. Urban natural areas can help build a constituency for conservation and protect some elements of biodiversity, especially if linked to wildlands in rural areas.

The Threat and the Action

> *In its first open confrontation with the public in the Olympic National Park battle, the Forest Service lost everything it wanted to retain. The public, acting through Congress, simply took the trees away from the Forest Service and gave them to the Park Service to be preserved. Since then, the Forest Service has lost over and over again, continuing to assert its economic-utilization imperative. The North Cascades were lost to it for the same reason.*
>
> —Carsten Lien, 1991

In 1930, a group of five people based in New York City founded an organization, the Emergency Conservation Committee, and successfully campaigned for the establishment of Olympic National Park, Kings Canyon National Park, and additions to Sequoia and Yosemite National Parks from national forest lands. This challenge to the very survival of the US Forest Service resulted in the agency designating areas as primitive and "wilderness," where logging and road-building were curtailed. Both the threat and the action of having land taken away changed the way the Forest Service did business.

This result is not limited to the early 1900s. During the campaign to create a Hells Canyon National Park from Forest Service land in Oregon, the agency changed its extractive management in the proposed park area and began to talk about "preserving" the region. While Hells Canyon did not become a national park (at least not yet), in 1975 the land was redesignated a national recreation area with the associated change in management. Since then, the campaign for—and threat of—a national park has lost momentum and the Forest Service management is reverting back to extractive activities.

Areas currently proposed for National Park designation include:

PRESENT LAND MANAGER	TO NATIONAL PARK
Olympic National Forest, WA	*Olympic National Park (expansion)*
Monongahela National Forest, WV	*Black Water Canyon National Park*
Wallowa-Whitman National Forest, ID & OR	*Hells Canyon/Chief Joseph National Preserve*
White Mountain National Forest, NH & ME	*White Mountain National Park*
Bankhead National Forest, AL.	*Bankhead National Recreation Area*
George Washington National Forest, VA.	*Shenandoah National Park (expansion)*
Arctic National Wildlife Refuge, AK	*Arctic National Park*
Cabeza Prieta National Wildlife Refuge, AZ	*Sonoran Desert National Park*
Atchafalaya National Wildlife Refuge, LA	*Atchafalaya River National Park*
Siskiyou National Forest, OR	*Siskiyou National Park*
Hart Mt. National Refuge and BLM, OR	*Steens Mountain National Park*
Flathead National Forest, MT	*Glacier National Park (expansion)*
Fort Niobrara National Wildlife Refuge, NE	*Nebraska Sandhills National Park*
State of Hawaii owned land	*Kauai National Park*
Corporate industrial forest land, ME.	*Maine Woods National Park and Preserve*

National park campaigns can unify the conservation community, as happened during the campaigns to create Olympic, Rocky Mountain, and North Cascades National Parks. Moreover, a campaign for new and expanded national parks does not preclude other campaigns. Indeed, other forest reform efforts—including campaigns for new national forest Wilderness Areas—could have a better chance because of the additional pressure on the Forest Service. What makes this initiative different, but complementary, is that conservationists would be giving presentations to groups and testifying in Congress *for* national parks—a positive, flag-waving message.

If well-briefed, funders of forest protection campaigns should readily understand the benefits of a bold new national parks campaign. A review of the agency's history suggests that attempts to reform the Forest Service have had some success—but that *significant* change was stimulated when Forest Service land was being removed from the agency's control.

In 1983 Wallace Stegner wrote: "National Parks are the best idea we ever had. Absolutely American, absolutely democratic, they reflect us at our best rather than our worst." It has been many years since the last national park was created out of national forest land. We can no longer talk about conserving the land. We must speak of restoring and *preserving* the land, to give absolute protection to wildlife. This sentiment finds expression in national parks. With a campaign to expand our national parks—this country's "crown jewels"—we will be protecting public land that must be left "unimpaired for the enjoyment of future generations," and, hopefully, forcing the Forest Service to reform the economic extraction model that has dominated the agency for more than 90 years. ☾

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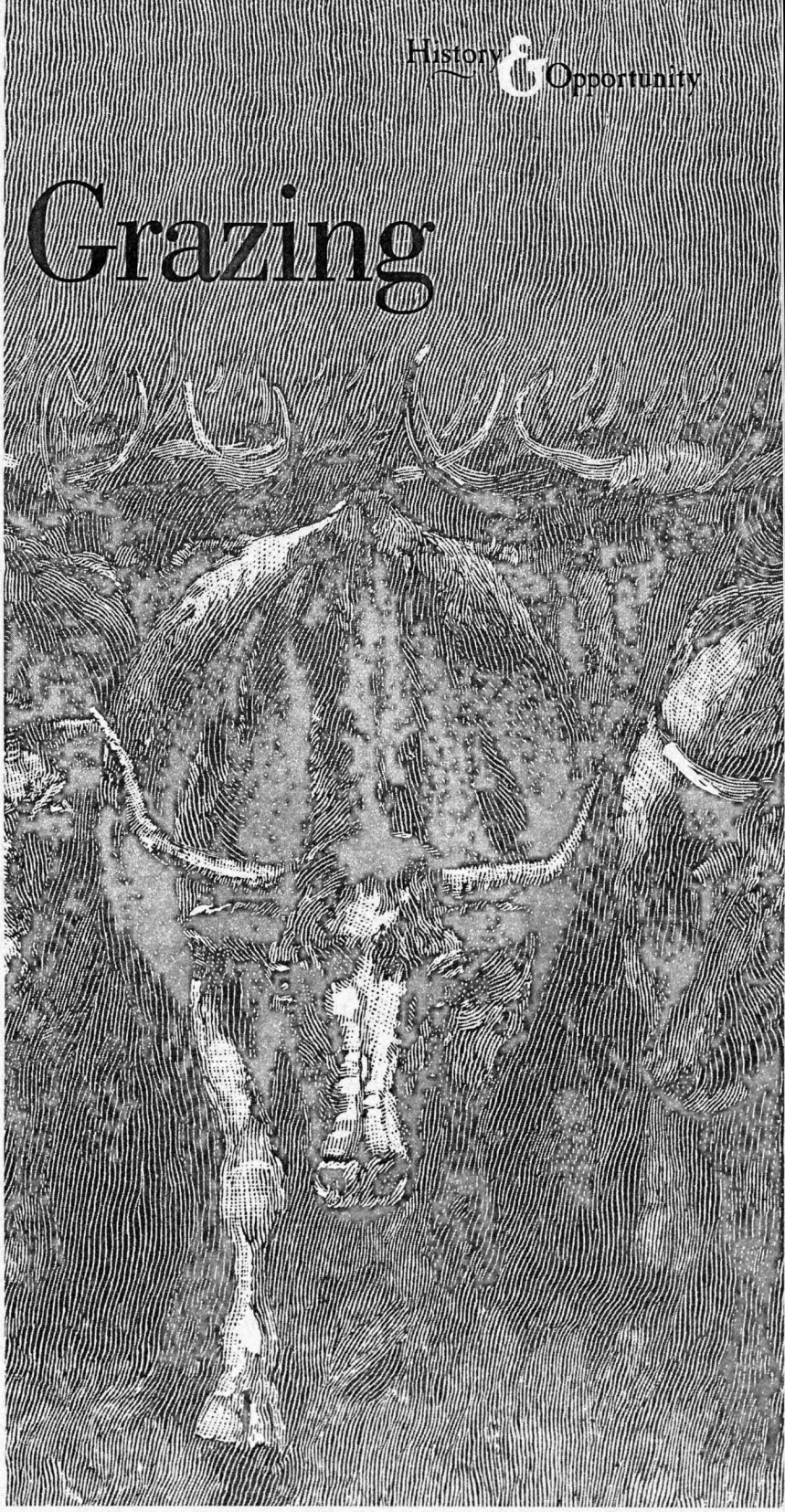
Livestock Grazing in the National Park and Wilderness Preservation Systems



by Andy Kerr and Mark Salvo

Domestic livestock grazing in the National Wilderness Preservation System is—in all cases—inimical to the wilderness concept. Nevertheless, it is allowed.

Livestock grazing in the National Park System is—in almost all cases—inimical to the purpose of national parks. Nevertheless, it is allowed. Livestock grazing is currently permitted in 32 units of the park system. Six of these are Civil War monuments (grazing occurred at the time of designation, indeed at the time of the war) or units surrounded by sprawling urban landscapes and are not considered further here.[1]

This article addresses the question: *Why!?* More importantly, we suggest how such abominations against Nature and sound public policy can end in the most politically and financially efficient manner.

Cowboy Power

Although livestock grazing on the public lands is ecologically destructive, economically irrational, and contrary to the wishes of the vast majority of the American people, it still occurs—even in the most sacred of national parks and Wilderness Areas. We believe there are four major reasons for the status quo.

1) History. Livestock (acting on behalf of cattle and sheep barons) were (ab)using the public lands for 50–150 years before any such lands were designated as parks or Wilderness Areas. Our political system usually grants great advantage to prior appropriation, and grazing is no exception.

2) Political power. Historically, cattle (and formerly sheep) barons were extremely powerful politically, and held public office in vast disproportion to their numbers. Our political system grants great advantage to the formerly powerful because the democratic system of checks and balances tends to resist change.

3) Unknowing public. Because cattle have been so pervasive throughout the American West for so long, few examples of ungrazed arid ecosystems are readily visible to the public. People are accustomed to seeing "cow bombed" landscapes. In contrast, examples of standing virgin forest are numerous (though not as numerous as clearcuts) and the public can easily appreciate the difference. Given the nature of arid lands, cow-damaged landscapes are often perceived as aesthetically pleasing, even though ecologically wounded.

Consider this poem written in 1907. The second line mars an otherwise eloquent tribute to wilderness.

> *Have you wandered in the wilderness, the sagebrush desolation,*
> *The bunch-grass levels where the cattle graze?*
> *Have you whistled bits of rag-time at the end of all creation,*
> *And learned to know the desert's little ways?*
> *Have you camped upon the foothills, have you galloped o'er the ranges,*
> *Have you roamed the arid sunlands through and through?*
> *Have you chummed up with the mesa? Do you know its moods and changes?*
> *Then listen to the Wild—it's calling you.*[2]

By the turn of the century, the American perception of desert and grassland wilderness was imprinted to accept cattle grazing as pervasive in otherwise pristine landscapes.

4) Unknowing conservation movement, apathy, and other priorities. Most of the conservation movement knows little more than the public about the ecological costs of livestock grazing. Historically, and to the present day, conservationists have chosen to ignore livestock grazing's chronic damage to instead address what are perceived to be more acute threats to biodiversity. Efforts against logging, road-building, mining, and development are higher priorities to most conservationists than livestock grazing.[3]

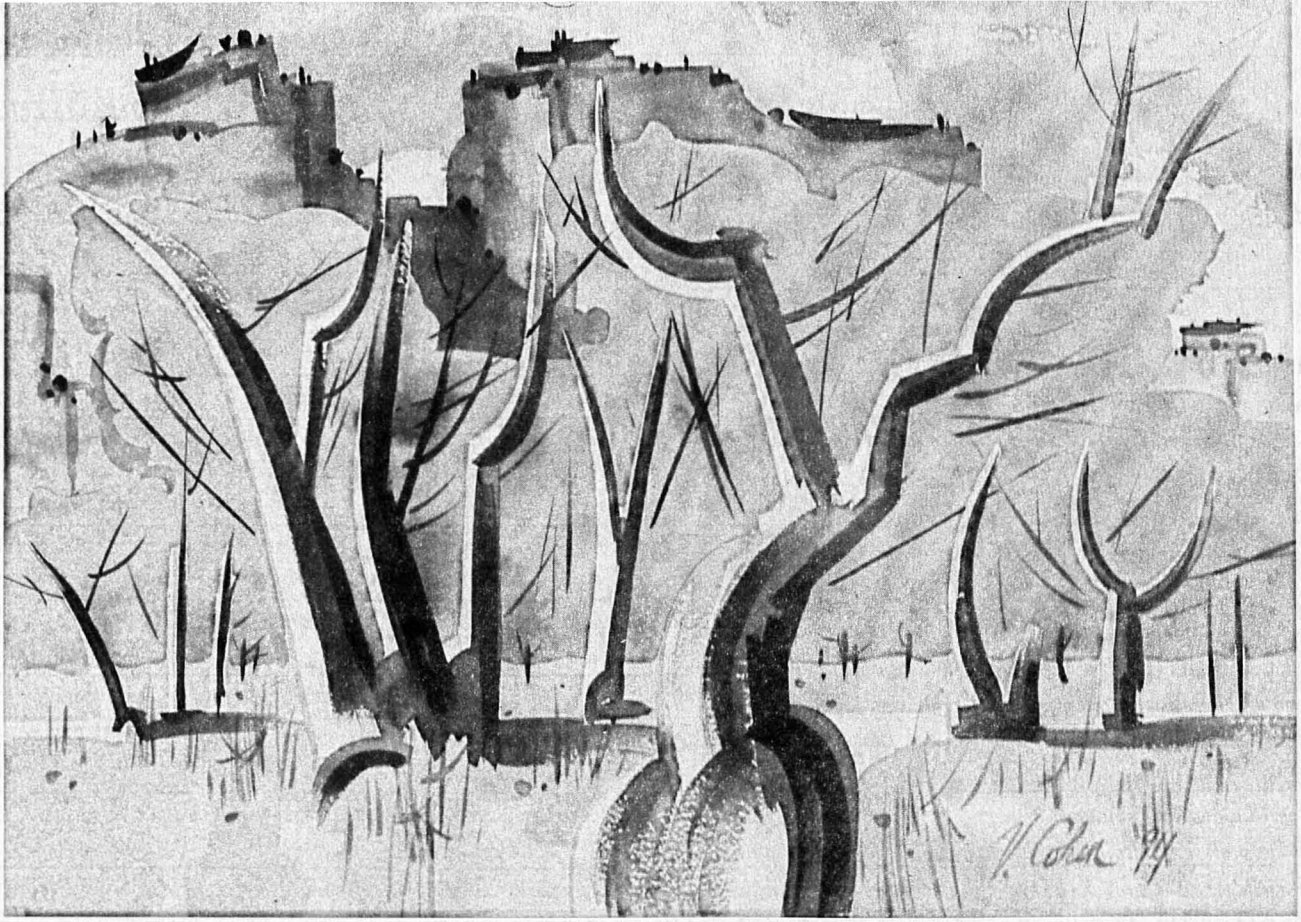
Grazing in the National Park System

Prior to their designation as national parks or monuments, most NPS units were used for livestock grazing. Compare the strong (and archaically eloquent!) language against timbering and mining in the act establishing Lassen Volcanic National Park—created about a week before the enactment of the National Park Service Organic Act of 1916—against the exception for livestock grazing (and cars).

> *Lassen Volcanic National Park shall be under the exclusive control of the Secretary of the Interior. He shall make such rules and regulations and exercise such powers as are enumerated in section 3 of this title....Such regulations shall be aimed primarily at the freest use of the said park for recreation purposes by the public and for the preservation from injury or spoilation of all timber, mineral deposits, and natural curiosities or wonders within said park and their retention in their natural condition as far as practicable and for the preservation of the park in a state of nature so far as is consistent with the purposes of this section and sections 201 and 203 of this title. He shall provide against the wanton destruction of the fish and game found within the park and against their capture or destruction for purposes of merchandise or profit, and generally shall be authorized to take all such measures as shall be necessary to fully carry out the objects and purposes of said sections....The regulations governing the park shall include provisions for the use of automobiles therein and the reasonable grazing of stock.*[4]

The Lassen grazing language is typical for National Park System units in the West (see table), and the National Park Service generally. In 1916 Congress passed the National Park Service Organic Act, creating the National Park Service and providing direction for managing the national parks.

> *The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified, except such as are under the jurisdiction of the Secretary*



of the Army, as provided by law, by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.[5]

The same law concedes grazing in parks:

Provided, however, That the Secretary of the Interior may, under such rules and regulations and on such terms as he may prescribe, grant the privilege to graze livestock within any national park, monument, or reservation herein referred to when in his judgment such use is not detrimental to the primary purpose for which such park, monument, or reservation was created, except that this provision shall not apply to the Yellowstone National Park.[6]

Before the creation of the National Park Service, the US Army managed our parks with a definitive dislike for domestic livestock. The Army excluded cattle from Yellowstone National Park since its establishment in 1872. The Army also defended Sequoia National Park against livestock.

In the winter of 1917–18, after the passage of the Organic Act, then Interior Secretary Franklin K. Lane sent a letter to Park Service Director Stephen Mather implementing a new grazing policy. The Lane Letter authorized cattle grazing in parks in "isolated regions not frequented by visitors" and where "natural features" would not be harmed.[7] It forbade sheep in the parks, however.

The Organic Act and the Lane Letter codified grazing in the National Park System.[8] Given the era, one can understand the allowance of limited cattle grazing, especially considering wartime pressures for beef production and the newness of the National Park Service. The agency had yet to establish itself as a sustainable bureaucracy capable of demanding adequate funds from Congress, commanding public support, and setting its own course.

The grazing provision in the Organic Act remains on the books today, although, mercifully, it has been mitigated by administrative regulation that disfavors livestock grazing:

(a) The running-at-large, herding, driving across, allowing on, pasturing or grazing of livestock of any kind in a park area or the use of a park area for agricultural purposes is prohibited, except:
1. As specifically authorized by Federal statutory law; or
2. As required under a reservation of use rights arising from acquisition of a tract of land; or

illustration by Valerie Cohen

3. As designated, when conducted as a necessary and integral part of a recreational activity or required in order to maintain a historic scene.[9]

"Historic scene" generally refers to Park System units associated with colonial times or the Civil War. A hostile administration could overturn this regulation.

Grazing in the National Wilderness Preservation System

When Aldo Leopold, the nation's greatest ecological thinker and cofounder of The Wilderness Society, wrote his management proposal to establish the nation's first formally protected wilderness area in the Gila country of New Mexico, he grandfathered in livestock grazing. Forest Service historian Dennis M. Roth noted:

In May 1922, Leopold, now assistant district forester in Albuquerque, made an inspection trip into the headwaters of the Gila River. When he returned, he wrote a wilderness plan for the area that excluded roads and additional use permits, except for grazing. Only trails and telephone lines, to be used in case of forest fires, were to be permitted.[10]

Regarding the Gila, Leopold's biographer Curt Meine added:

Some cattle grazed there, but Leopold considered this an asset in that frontier grazing operations were themselves of recreational interest. The cattlemen, too, would benefit by the exclusion of new settlers and hordes of motorcars.[11]

Meine also observed that Leopold was seeking ranchers as allies in his efforts to regulate hunting as part of an overall game management regime, which included predator control at the time.[12] This was before Leopold killed his last wolf and watched the "fierce, green fire" die in its eyes.[13] However, as with wolves, Leopold's thinking on livestock grazing evolved. Meine noted that "in his later years, he would place increasing emphasis on wilderness as a 'land laboratory,' a place to understand how biotic communities are able to function in a state of health." After visiting de facto wilderness in northern Chihuahua in 1936–37, Leopold wrote,

I sometimes wonder whether semi-arid mountains can be grazed at all without ultimate deterioration. I know of no arid region which has ever survived grazing through long periods of time, although I have seen individual ranches which seemed to hold out for shorter

Comparison of Livestock Grazing

UNIT NAME	TYPE	STATE	DATE ENACTED
Mesa Verde	*Park*	*CO*	*Jun. 25, 1910*
*Lassen Volcanic**	*Park*	*CA*	*Aug. 9, 1916*
Grand Canyon (I)	*Park*	*AZ*	*Mar. 7, 1928*
*Sequoia**	*Park*	*CA*	*Jul. 3, 1926*
Coronado	*Mem.*	*AZ*	*Aug. 18, 1941*
Grand Teton	*Park*	*WY*	*Sep. 14, 1950*
Dinosaur	*Mon.*	*UT/CO*	*Sep. 8, 1960*
Canyonlands (I)	*Park*	*UT*	*Sep. 12, 1964*
Canyonlands (II)	*Park*	*UT*	*Nov. 12, 1971*
Arches	*Park*	*UT*	*Nov. 12, 1971*
Capitol Reef (I)	*Park*	*UT*	*Dec. 18, 1971*
Glen Canyon	*RA*	*AZ/UT*	*Oct. 27, 1972*
Grand Canyon (II)	*Park*	*AZ*	*Jan. 3, 1975*
Capitol Reef (II)	*Park*	*UT*	*Oct. 15, 1982*
Black Canyon of the Gunnison (I)	*Mon.*	*UT/CO*	*Jul. 13, 1984*
*Great Basin (I)**	*Park*	*NV*	*Oct. 27, 1986*
El Malpais	*Mon.*	*NM*	*Dec. 31, 1987*
Capitol Reef (III)	*Park*	*UT*	*Sep. 27, 1988*
Death Valley	*Park*	*CA*	*Oct. 31, 1994*
Mojave	*Preserve*	*CA*	*Oct. 31, 1994*
*Great Basin (II)**	*Park*	*NV*	*Apr. 26, 1996*
Black Canyon of the Gunnison (II)	*Park*	*CO/UT*	*Oct. 21, 1999*

RA=Recreation Area • Mon.=Monument • Mem.=Memorial
* Presently no livestock grazing occurs.

Provisions for Selected National Park System Units

SUMMARY OF GRAZING PROVISION
Grazing may be permitted, but not in prehistoric ruins or if it excludes the public from free or convenient access thereto.
Prescribes regulations for the "reasonable" grazing of livestock.
48.79 acres added to park on which livestock permitted on adjacent national forest allowed to drift across and graze.
Secretary of the Interior may allow grazing if not detrimental to the park's primary purpose.
Grazing may continue when not interfering with recreational development. • Fences prohibited except 1) along international boundary, 2) beside memorial roads or approach roads, and 3) around memorial areas within which improvements have been located by NPS. • Any roads constructed must have cattle underpasses. • Water rights for livestock remain with permittee.
Grazing grandfathered with 25-year permits for the lifetime of the permittee and any heirs, if heirs were members of the permittee's immediate family on date of enactment. • Permanent stock driveways required across park lands.
Grazing grandfathered with 25-year permits for the lifetime of the permittee and any heirs, if heirs were members of permittee's immediate family on date of enactment.
Grazing may continue during term of lease and one additional term.
Allows renewal of grazing for one additional term if existing on date of enactment. • Allows for permanent livestock trails, watering rights, and driveway.
Existing grazing permits renewable for one additional term. • Allows for permanent livestock trails, watering rights, and driveway designation by "reasonable" regulation.
Grazing may continue during term of lease and one additional term. • Trailing and watering required with "reasonable" regulation.
Grazing grandfathered, with permits managed by BLM under BLM rules and Park Service conservation guidelines.
Grazing on additional lands allowed to continue during term of lease and one additional term. • Permittees within old national monument boundary granted lifetime grazing privilege.
Requires National Academy of Sciences study to: 1) determine the historic and current impact of grazing upon the natural ecosystem and cultural resources of the park; 2) determine the current impact of grazing upon visitor use within the park; 3) evaluate alternatives to grazing within park on adjacent BLM lands; 4) determine the economic impact on grazing permit holders, and on the local economy, if such permits were terminated; and 5) include such other information and findings as may be deemed necessary by the Secretary of the Interior.
Allows permanent livestock grazing on lands acquired with less than fee interest, if not detrimental to visual resources of the monument. • Construction of fences and stock ponds permitted.
Grazing permanently grandfathered, subject to any regulations the Secretary may prescribe.
Grazing allowed for 10 years, then terminated.
Grazing occurring on December 18, 1971 may continue for lifetime of the permittee or direct descendants (sons or daughters) born on or before December 18, 1971. • No stocking increases or physical improvements allowed. • No vested rights created in public land or forage. • 1982 legislation requiring National Academy of Sciences study repealed. • Grazing to be managed to encourage the protection of the park's natural and cultural resource values.
Grazing grandfathered at current level, subject to applicable law and regulation. • If the base property attached to a permit is available for sale, it shall be prioritized over other park acquisitions, subject to negotiation with willing seller.
Grazing grandfathered at current level, subject to applicable law and regulation. • If the base property attached to a permit is available for sale, it shall be prioritized over other park acquisitions, subject to negotiation with willing seller.
Permittee may donate permit to the Secretary who is required to retire it. • Allows transfer of grazing allotments inside the park for allotments outside the park, if affected agency determines no overgrazing will occur.
Grazing allowed at current level, including in Wilderness Areas, subject to applicable law and regulation, for the following terms: 1) for the lifetime of an individual permit holder; or 2) for the lifetime of individual permit holder, or dissolution of partnership or corporation, in the case of a commercial permit holder. • Secretary may accept voluntary retirement of permits for grazing in park.

Primary source: Kathy M. Davis, "General and Specified Legislative Authorities Pertaining to Domestic and Feral Livestock for Grazing in the National Park Service." National Park Service, Phoenix, AZ (unpublished draft, July, 23, 1999).

periods. The trouble is that where water is unevenly distributed and feed varies in quality, grazing usually means overgrazing.[14]

Leopold's change of heart could not save the Wilderness System from hungry livestock. Once the precedent favoring grazing was established, it became impossible to change later in more formalized Forest Service wilderness rules. As Roth noted:

Grazing is the oldest and best-established use of national forest areas. Until the 1920s, grazing fees were the largest source of income from all national forest system lands. Stockmen were a potent political force in the West and exerted their power whenever the Forest Service threatened to raise grazing fees or cut back on overgrazing. Under these circumstances the Forest Service had allowed controlled grazing in wilderness areas under the L-20 and U Regulations.[15]

The first draft of what became the Wilderness Act, written by Wilderness Society Executive Secretary Howard Zahniser, characterized livestock grazing in wilderness as a "nonconforming" use which should be terminated "equitably."[16] In subsequent versions of the bill, Congress stated that "grazing of domestic livestock...*may* be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable" (emphasis added).[17] However, the final language in the Wilderness Act of 1964 states "...the grazing of livestock, where established prior to the effective date of this Act, *shall* be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture" (emphasis added).[18]

At the time the Wilderness Act passed in 1964, conservationists were more concerned about ongoing Forest Service attempts to declassify existing administrative wilderness areas to allow new road-building and logging, rather than the continued grazing of livestock. Robert Wolf, who served on the staff of Senator Clinton Anderson (D-NM), then chair of the Senate Interior and Insular Affairs Committee, says Anderson went along with the compromise to ensure passage of the wilderness bill. Anderson, a former Secretary of Agriculture, knew that grazing was subject to reduction for purposes of conserving range condition. Anderson also felt that grazing was increasingly uneconomic and would decline in the future.[19]

In 1980, Congress again took up the matter of Wilderness grazing in the Colorado Wilderness Act, stating that:

The Congress hereby declares that, without amending the Wilderness Act of 1964...with respect to livestock grazing in National Forest wilderness areas, the provision of the Wilderness Act...relating to grazing shall be interpreted and administered in accordance with the guidelines contained under the heading "Grazing in National Forest Wilderness" in the House Committee Report...accompanying this act.[20]

This is a very unusual provision of law. It states that Congress is not amending the Wilderness Act, but it effectively does. It also incorporates, by reference, language in a committee report. Like all obtuse, confounding, and unclear congressional language, there are reasons for this.

In 1980, the conservation community was fighting dreaded "hard release" legislation. Such legislation would have prevented the Forest Service from ever again considering Wilderness designation for roadless areas. If enacted, the agency's final environmental impact statement on its second Roadless Area Review and Evaluation (RARE II) would stand for wilderness areas for all time. A compromise was struck where Congress enacted "soft release" language, which prohibited further wilderness consideration for a specified time. Part of the compromise was what became known as the "Colorado grazing lan-

For $1.6 billion the scourge of livestock grazing—not only within the National Park and Wilderness Preservation Systems, but on all public lands—can end.

guage" (although it applies to all national forest Wilderness Areas, and subsequently to Bureau of Land Management Wilderness Areas as well).

The statement—contrary to fact—that the Wilderness Act was not being amended was a face-saving gesture to conservationists who surrendered the issue. Somewhat curiously, the Wilderness Act sits unamended in the United States Code, precisely as it was enacted in 1964. Compare this to the Wild and Scenic Rivers Act of 1968 in which additional stream segments have been protected by amending the original law. Amendments have also improved the overall protections afforded by the rivers law. As additional areas are protected under the Wilderness Act (along with any weakening provisions that accompany them), they are placed elsewhere in the United States Code, usually as a legislative "note." Consequently, conservationists have a colorable assertion that "the Wilderness Act" has never been weakened.

The Colorado grazing language entrenches livestock interests in our National Wilderness Preservation System.[21] It ratifies, in stronger terms, the grandfathering of livestock grazing in Wilderness Areas. It expands the Wilderness Act grazing provision to include Wilderness Areas managed by any federal agency.[22] It allows the use of motorized equipment to service livestock.[23] It allows for new fences, water, and other developments.[24] It allows for *increased* numbers of livestock.[25] Any authority previously conferred upon the Secretary of Agriculture to require reasonable regulation of grazing to protect wilderness values is weakened.[26] There is effectively no restriction on domestic livestock grazing—no matter how reasonable—in any Wilderness Area as a result of its designation as such.[27]

Current Trends No Better

Every relevant Wilderness bill enacted by Congress has included language to provide for livestock grazing.[28] Congress has not revisited grazing in Wilderness since the Colorado compromise.

For the National Park System, congressional grazing policy has slowly improved. In 1994, Congress enacted the California Desert Protection Act. While grazing in the new Death Valley National Park and Mojave National Desert Preserve was permanently grandfathered (at no more than current levels and subject to Park Service regulations), authority was granted to the National Park Service to acquire base properties (those private lands to which federal grazing permits have traditionally been attached) in order to end grazing on adjacent park lands.[29]

With fits and starts, Congress has also begun setting a time-certain end to grazing in some new parks. In 1999, Congress established the Black Canyon of the Gunnison National Park, grandfathering livestock grazing in the park 1) for the lifetime of the individual permit holder in the case of an individual permittee; or 2) for the lifetime of the individual permit holder, or dissolution of the partnership or corporation, in the case of a commercial permit holder.[30]

While we appreciate such congressional actions, they are rare, and they do not occur for parks already established. Ultimately, these creative solutions are at the mercy of powerful rancher-lobbyists who could act to prevent them in the future.

The Solution: Permit Retirement

Despite the inability of the conservation community to effectively address the problem of livestock grazing in our nation's Wilderness Areas and parks through traditional means, progress has been made using a new market approach. In many cases, funds have been secured to compensate federal grazing permittees for voluntarily relinquishing their grazing privileges (they are not rights) back to the government. Once permittees have renounced their privileges, the federal land management agencies have used a variety of methods to retire the permit.

Money talks. Numerous permittees, when offered fair compensation, have traded their permits for cash. There are indications that many more permittees would take similar deals if offered. The transactions completed to date have all occurred under special circumstances—within special land designations, supported by aggressive public servants and an engaged conservation community (some "good cops" who come up with the money and other "bad cops" who threaten Endangered Species Act listings, litigation, and other troubles for permittees). To allow for broad applicability on all public lands, we must change the law.[31]

The total forage allocated to livestock grazing on BLM lands is 12,186,335 animal unit months (AUMs).[32] Estimated forage allocated to grazing on the national forests is 9,249,239 animal months.[33] A reasonable and generous estimate of the West-wide average fair market value per AUM is $75.[34] For $1.6 billion the scourge of livestock grazing—not only within the National Park and Wilderness Preservation Systems, but on all public lands—can end. The major source of funding for such a buy-out would have to be the federal government. Disregarding the diminution of recreation conflicts and the benefits to biodiversity and watershed protection that such an action would engender, this is also a very attractive financial investment for the taxpayer. Current federal subsidies for public lands ranchers total about twenty-five percent of that amount annually.[35]

Critics within the conservation community have these major objections to paying the grazing permittees to end public lands grazing:

- Grazing is a privilege, not a right. The federal government can withdraw it anytime.
- The taxpayers should not have to pay permittees to not cause damage to the public's lands.
- It is morally wrong to reward resource abuse on public lands.

These are valid criticisms, worthy of thoughtful consideration. We offer the following response:

■ While the federal land management agencies can reduce or eliminate grazing—and, in fact, are under a legal obligation to do so—they very rarely do. Where agencies have withdrawn grazing privileges, it is usually due to expensive litigation by conservation groups, a permittee who refuses to pay his grazing fee (usually the permit is simply reissued to another rancher), or where the agency manager knows that the bottom line of the permittee will not be harmed by the decision (coincidental compensation by a third party). In some cases, land managers have proposed reductions for ecological reasons, but have had their plans nixed by agency directors under congressional pressure.

■ Taxpayers are already paying permittees, through subsidized grazing fees and other assistance programs, to degrade the public lands. Consider the buy-out payments as hush money to the permittee not to complain on his way out the door.

Moreover, it's just money. Is it more important to defend the federal public lands or the federal treasury? Choosing is not necessary in this case, because permit retirement does both most effectively.

■ To conserve and restore the Earth, sometimes one has to rise above pure principle. An excessive adherence to principled opposition to an injustice can often interfere with ending the injustice.

There can be a time—in our lifetime—when we enjoy a freedom long lost to Americans. That freedom is being able to toss a sleeping bag out on our public lands and not having to worry about it landing on cattle dung. ☾

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21. House Comm. on Interior and Insular Aff., *Designating Certain National Forest System Lands in the National Wilderness Preservation System, and for Other Purposes,* HR Rep. No. 617, 96 Cong., 1 Sess. (1979).
22. Ibid, p. 10 ("...it has been the clear intent of Congress...that the practical language of the Wilderness Act would apply to grazing within wilderness areas administered by all Federal agencies, not just the Forest Service").
23. Ibid, p. 12 ("Where practical alternatives do not exist, maintenance or other activities may be accomplished through the occasional use of motorized equipment. This may include, for example, the use of backhoes to maintain stock ponds, pick-up trucks for major fence repairs, or specialized equipment to repair stock watering facilities").
24. Ibid.
25. Ibid ("If land management plans reveal conclusively that increased livestock numbers or animal unit months could be made available with no adverse impact on wilderness values...some increases in AUMs may be permissible").
26. Ibid, p. 11 ("Any adjustments in the numbers of livestock permitted to graze in wilderness areas should be made as a result of revisions in the normal grazing and management planning and policy setting process...").
27. Ibid, p. 11 ("There shall be no curtailments of grazing in wilderness areas simply because an area is, or has been designated as wilderness").
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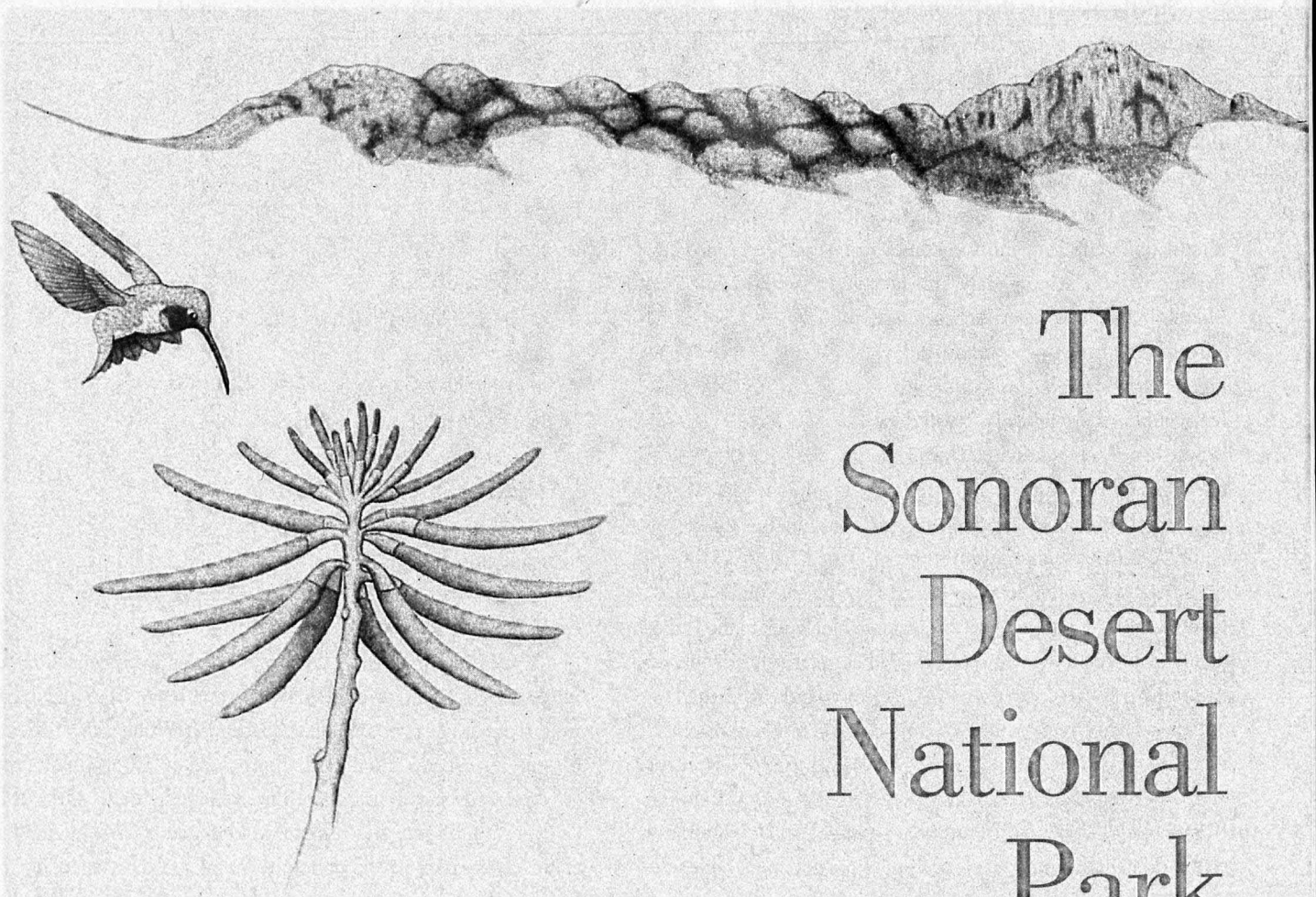
33. General Accounting Office. 1993. Profile of the Forest Service's Grazing Allotments and Permittees. Washington, DC. A Forest Service animal month is approximately the equivalent of a BLM AUM, or the amount of forage necessary to feed one cow and calf, or five sheep, for one month.
34. Kerr 1998 (see note 31), p. 27.
35. Ibid.



The Sonoran Desert National Park

A Modest Proposal of Extraordinary Scope

by Carlos Martínez del Rio and Bill Broyles

The heart of the Sonoran Desert is "el gran despoblado," the great empty. A hard land where people have not lingered, the region is devoid of people, cows, and roads. It is often called a place of silence and at times the stillness is so deep and the heat so fierce that one can hear blood coursing from within, outward to the sweat-drenched skin. But at certain times and in certain places, the clamor of life is exuberantly abundant. Nights after monsoonal storms are riotous. The shine of a flashlight reveals a desert floor alive with frantically running sun spiders and slowly roaming phlegmatic tarantulas. In washes, which are usually good places to camp, chattering elf owls can keep a desert adventurer awake for hours.

Unlike many of our desert-loving friends who seek out the deep silence of this place, we roam the desert to explore and study its life—and life is rarely silent. In mid-April the white-winged doves arrive from Mexico. Males immediately begin calling lustily from the top of saguaros to summon females. A few weeks later they plunge their heads into cactus blossoms and drink deeply. We too plunge calibrated capillary tubes into the flowers to measure the characteristics of nectar and often sip a few microliters just to share a drink with the doves.

black-chinned hummingbird and coral bean by Douglas Moore

Strictly speaking, the Sonoran Desert is not a desert. It covers a wide range of environments, from extremely dry to moderately moist. Summer rains can turn the vegetation in some of the washes into impenetrable green jumbles fastened by vines. In the open desert one can run; in the washes a hiker must crawl and pick her way. The desert's diversity, and much of its appeal, comes from transitions—the desert vegetation shifts, sometimes almost imperceptibly and sometimes dramatically. From where we often stand at our study site at the top of the Sand Tank Mountains, we can see washes lined with ancient trees of the xeroriparian trinity—mesquite, paloverde, and ironwood. These green washes snake through dry creosote plains. The slopes of the mountains are densely forested with saguaros and at our feet is a lushly vegetated ravine. Our view is expansive, but we sleep under an old ironwood, sheltered in the intimacy of a deep canyon. How can we protect this gran despoblado that is not empty and that is not a desert?

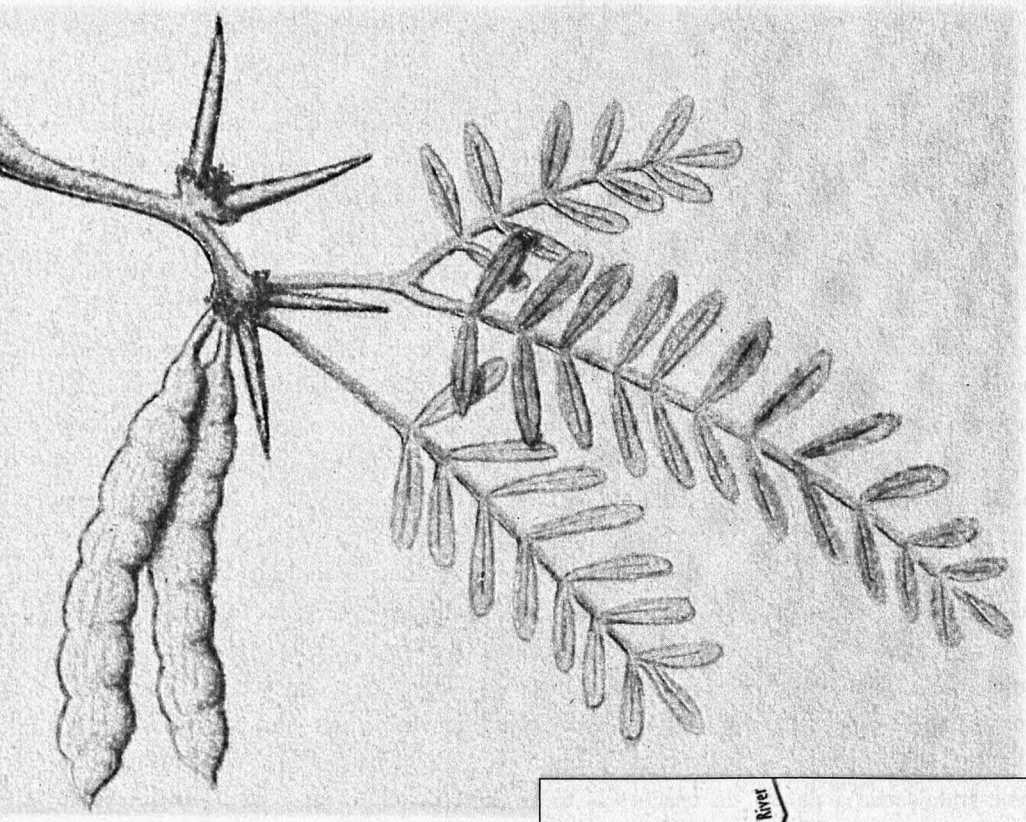
The heart of the Sonoran Desert can be safeguarded with a bit of leadership and political will. A large block of it in the United States is under federal ownership and is relatively untouched. Adjacent to protected areas in the US, Mexico has established two large biosphere reserves (see map): Reserva de la Biósfera El Pinacate y Gran Desierto de Altar (Pinacate Biosphere Reserve) and Reserva de la Biósfera Alto Golfo de California y Delta del Rio Colorado (Upper Gulf Biosphere Reserve). In all, 6.5 million contiguous acres are under some form of protection on both sides of the border. This is the good news. The bad news is that these abutting protected areas are under a tangle of jurisdictions. Among the US agencies responsible for managing the desert and its denizens are the Arizona Game and Fish Department, National Park Service, US Fish and Wildlife Service, Bureau of Land Management, and the Department of Defense. Effective conservation of the Sonoran Desert's biological values is thwarted by administrative fragmentation.

Preserving the Sonoran Desert will require a bold, albeit relatively simple step. This action was first proposed thirty years ago by then-Secretary of the Interior Stewart Udall, who conceived the idea of a binational protected area. The US would contribute by establishing a Sonoran Desert National Park. Unfortunately, President Lyndon Johnson balked and the park never materialized. Recently, Udall's idea has been revived by a visionary group of desert advocates. In its new iteration, the proposed national park would combine Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Preserve into one national park. Sections of the Barry Goldwater Air Force Range that stretch from east of Gila Bend to Yuma would be added as a national preserve; such a preserve would act as a buffer for the core areas of the park and would allow hunting. The Department of Defense uses only a fraction (about 2%) of the range for bombing and they need only 6% of the ground for targets, roads, runways, and radars. They do need an enormous airspace and the preserve would sustain their right to fly over the Goldwater.

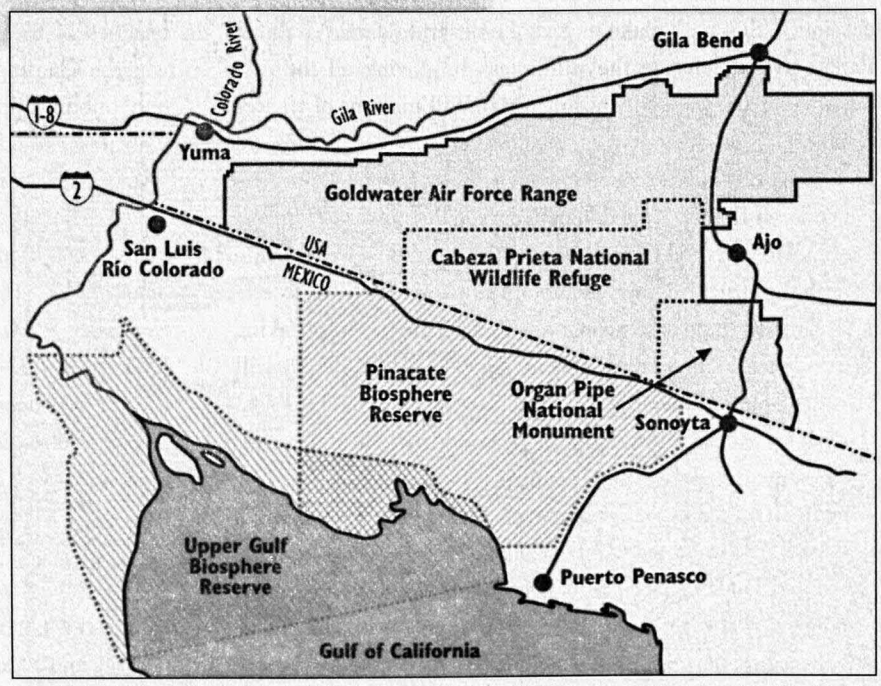
The conflicting mandates of the agencies that currently manage this region (multiple use, wildlife management for hunting, and so on) do not facilitate conserving the land's integrity into the future. The mission of the National Park Service—"to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations"—makes this agency the most appropriate to manage the land. As Harold Smith, former superintendent of Organ Pipe Cactus National Monument, underscored, "It is one landscape, but there are lots of boundaries and lines and jurisdictions out there, all of which can become zones of conflict." A single administration by the National Park Service could overcome past conflicts and avert future ones.

If all three parcels in the United States were consolidated into one management unit, the Sonoran Desert National Park would comprise over three million acres. When the Mexican biosphere reserves are added, approximately 6.5 million acres of conserved land would stretch from the salty delta of the Rio Colorado to the junipers of the Ajo Mountains. This binational chain of reserves would protect some of the most spectacular lands on the continent, innumerable spots of rich cultural significance, and an incredibly diverse desert biota, including more than 700 species of native vascular plants and over 50 species of mammals (such as imperiled Sonoran pronghorn and healthy populations of desert bighorn sheep). More than 48 species of amphibians and reptiles have been reported at Organ Pipe Cactus National Monument alone; with 20 times the land surface of the monument, the binational area would protect a much higher number.

Establishing the Sonoran Desert National Park will also safeguard some of the most important migrant pollinators that are the glue of our continent. Two species of migrant pollinators breed in the Sonoran Desert: western white-winged doves and lesser long-nosed bats. The doves are saguaro specialists; they pollinate saguaro flowers and eat saguaro fruit. When flower buds begin to crown saguaros the birds arrive, and they leave when the rich pulp of the last fruit is consumed. Female long-nosed bats also come to the desert in mid-April. They arrive pregnant and congregate into sometimes enormous maternity colonies. One colony in a lava tube at the border between Mexico and the US can house up to 120,000 females. Another colony in Organ Pipe Cactus National Monument



velvet mesquite by Douglas Moore



The Sonoran Desert National Park would weld three federal units into one and neighbor two biosphere reserves in Mexico.

shelters 18,000 bats. Even the most conservative calculations yield an astonishing number of flowers pollinated and seeds dispersed by each of these colonies. Early in the season, females feed on flowering and fruiting saguaro and organ pipe cacti at lower elevations. Later, they move with their young to higher elevations where they feed on agave blossoms. By late September, both bats and doves have departed to their wintering haunts in western Mexico.

The Sonoran Desert is not only a critical breeding area for migrant pollinators, it is also a key stepping stone in the nectar corridor that binds the continent together. In late spring, many desert bushes bloom and are patronized by hummingbirds making their way north. The flowers of chuparosa, desert honeysuckle, and ocotillo attract large numbers of birds. A lazy spring morning watching a fiery patch of flowering ocotillo reveals hummingbirds (rufous, Costa's, and black-chinned) as well as many species of migrant warblers. We have watched Nashville, orange-crowned, yellow-rumped, black-throated gray, and Wilson's warblers in a single ocotillo patch. The warblers systematically probe the flowers for nectar and get thoroughly dusted with pollen. We suspect that the importance of warblers as migrant pollinators and of nectar as a migratory fuel for warblers has been underrated.

If the park is not established, the Department of Defense will turn some of its Goldwater holdings over to the Bureau of Land Management. With this action the sadly foreseeable consequences of multiple use would be inevitable. As if to prove our point, the BLM currently is conducting a study to see *who* should get the Sand Tank Mountains. Privatization and development are real possibilities. The Sand Tanks are wild and remote—these 84,000 acres have not seen a cow or a miner's shovel for over half a century. Because they are relatively pristine, the mountains provide unique sites for scientific study. We

conduct our research on saguaros, doves, and migrant pollinators in the Sand Tanks because it is one of the very few places in the Sonoran Desert where natural processes persist unhindered by human interference. The irreplaceable Sand Tanks should be kept within a newly designated National Preserve, but current legislation directs BLM to hack them off and place them in the hands of "another entity," whoever that might be. It will take a park study bill like the one proposed by Senator John McCain in 1999 (S1963) to protect this precious tract of desert from development.

The idea of a Sonoran Desert National Park and Preserve has significant public support. A recent poll among both urban and rural Arizonans revealed 84% in favor of the park and preserve proposal. Only 9% of those polled registered opposition. Curiously, we have found opposition to the park among a few conservation-minded desert lovers. Granted, these friends are a cantankerous lot and would oppose—on principle—any regulatory mandate. Nevertheless, some of their questions merit discussion. Will a park make us love the desert to death? Will the Park Service suffocate the wilderness by paving all the now impassable and blessedly awful roads? Will millions of visitors smother the fragile cryptogamic soils? Our answer is simple: of love, hate, and indifference, only love gives us a chance to save the Sonoran Desert. If we don't encourage the public to love the land, it will be hated to death. A park and preserve will provide us with the structure, mission, and means to protect the desert.

Already, throngs of people are visiting the desert or taking up residence in the region. BLM predicts that 10,000 folks will visit the Goldwater Range next year. The population of Tucson, only an hour away from the proposed park, is growing at rates comparable to developing countries (about 3% annually). Phoenix's population is growing even faster. Either we create a park with a well-crafted plan to manage crowds, or we lose this enchanted land. Leave it to uncoordinated multiple-use management and we can kiss the wilderness goodbye. The establishment of a park and preserve would likely affect camping rules and severely limit off-road driving, which is rampant in the Goldwater Range. The Park Service has a good record of enforcing its rules and regulations (one of the reasons why park lands are, in general, in better condition than other federal lands). Although the agencies that currently manage the Cabeza Prieta and the Goldwater Range have some strict use rules, they do not have the budget and staffing to enforce them. We think the aggravation of having to procure a backcountry camping permit would be more than compensated by the knowledge that no more yahoos will drive their off-road vehicles over the fragile desert vegetation to shoot saguaros.

The proposal to create a Sonoran Desert National Park is modest and relatively simple to execute, yet the result would be extraordinary. The three units of federal land would be unified into one national park and preserve: Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Refuge would be combined into a national park, and the Goldwater Range would become a national park preserve, enabling the military to continue its pilot training mission until a miracle or a global catastrophe bring world peace. Hunting could also continue on the Goldwater.

Creating the park and preserve would cost little. The land is already under federal ownership and withdrawn from other uses. There is no mining, grazing, or settlement. The park would be the second largest in the lower 48 states, right behind Death Valley. Considering the contiguous Pinacate and Upper Gulf reserves in Mexico, which are already secured, the binational protected area would be among the world's largest, extending from the oaks and junipers at the top of the Ajo Mountains to the beaches of the Gulf of Cortez. From bighorn sheep to blue whales. Creating the Sonoran Desert National Park requires only public support and political will. Congress could immediately designate the park if we press our legislators to protect the beauty and biodiversity of this region. ☾

Ideas, help, and monetary contributions can be sent to the Sonoran Desert National Park Project, Southwest Center, University of Arizona (1052 N. Highland Ave., Tucson, AZ 85721; 520-621-5774; sondesnp@u.arizona.edu). Visit their web site at www.SonoranDesertNP.org. See the following references for further information on the natural history of the Sonoran Desert and on the park proposal:

Phillips, S.J. and P.W. Comus, eds. 2000. *A Natural History of the Sonoran Desert.* Tucson, AZ: Arizona-Sonora Desert Museum Press.

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ACKNOWLEDGMENTS Greg Hayward, Martha Martínez del Rio, and Todd McWhorter tidied up our undisciplined prose. Richard Felger's ideas and passion for the desert shaped this manuscript.

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Quiet Preservation

Don't Make It a National Park

by David Rothenberg

Maybe you've seen the brochure. It looks just like a real national park brochure except it isn't—it's a fantasy brochure for the Maine Woods National Park. Fabulous idea, to preserve those exceptional northern woods so marauded by forestry companies and now being sold left and right for development or other nefarious purposes. Of course they should be secured for all to enjoy! One thing we all know for sure is that we need more national parks. Right?

Not necessarily. National parks are for people, not for animals, plants, or the spirit of the wild. A national park means traffic, overuse, extensive tourist facilities, too much publicity. Especially in the northeastern United States, where there are so few other national parks to compete for our attention. Take a look at even the lesser-known trails of Acadia National Park, on the Maine coast. Every junction mapped and signed exactly. Overused paths that are eroding down to bare roots and rocks. Mountain bikes zooming down carriage roads that are so well-restored that they are nearly like paved highways through the woods. Often a toxic haze of pollution on a summer afternoon. A famous destination, for sure, among the nation's most-visited national parks. A beautiful place, but a hard place to find even a bit of wilderness.

The politics of preservation are so difficult and the work so incessant, sometimes we forget what to do with what we have preserved. It is, of course, a mixed blessing that national parks are overused—at least it shows that the people of this country care enough to visit the wilderness and keep coming back. It is also a bit of a paradox. We want as many people as possible to care about wild lands, and we want people out there in the thick of it, experiencing Nature, but we're disappointed to find these same places teeming with people. Can we secure the future of beautiful, valuable places like the Maine Woods without bringing too much attention to them? I think there are ways, as long as the public doesn't expect that labeling something a park means everything is prepared for the visitor on a silver platter. When you meet the wilds, you should be ready to change your life.

Maine coast by Mary Elder Jacobsen

Let me describe three places I visited last summer, on or near the coast of Maine. Each represents a different kind of public land solution, and I describe them not from the point of view of how they are managed, but from the perspective of the naive visitor who arrives not knowing what to expect. I won't say exactly where they are because I don't want to call too much attention to these special places. You'll find them if you want to, with a few good maps and a real desire to get there. There are probably places like this close to where you sit, though for them to stay wild, not everyone can know they exist. Although I relate my own human experience, what is important about these places is that they were set aside as protected natural areas, not just as places for people like me to enjoy. There is much enjoyment to be found where we are not the center of attention.

First is a place I spotted on the map—an island far out into the sea but still reachable by a series of small bridges. By the map, it had to be an interesting destination. A few hours on quiet roads with few signs or clues got us to the dirt road that disappeared into the forest. A small parking lot, and one trail through the woods to the sea. A large poster with a checklist of all the birds one might possibly see. A list of rules: please don't park anywhere else but in this parking lot. If there is no room, *please come back another day*. Imagine the audacity of not building enough parking for everyone who wants to get to this place! Of course not: it is Nature that is to be conserved here, and we are only to be visitors, if there is room for us. I have never been in a national park that advised that kind of visitor restraint.

The trail, rocky and unimproved, comes out onto a pristine coast after an hour's walk up and down through woods. And there it ends. This deserted island shore retains a quality missing at Acadia, a wildness that places a humility on us human visitors, so that we step back to listen to the rush of the water's swells, dip quickly into the frozen sea, and nearly surprise a baby eagle, brown all over, watching guard over his domain from a scraggly tree. What is there to report from the wilderness? As little as possible. It doesn't exist for our stories.

Not that we should scowl when meeting others out for the same kind of respite from the world, but we don't want the wilds to be overrun. Sure, most national parks are pretty quiet once you get half a mile from the blacktop, but the more access that is put in, the harder it becomes to find solitude. Keep the roads dirt, keep few signs up, just don't destroy the *clues*.

HERE'S ANOTHER PLACE IN MAINE, JUST INLAND A LEAGUE or so, a small mountain with spectacular views. You take a few dirt roads in, a left and a right, and come to a small parking lot at the gravel's end. Here are various blueprint-like maps, carefully delineating which land is public and which is private, pointing out several trails one can take. They are marked, but just barely. No distance information, just arrows suggesting which way to head. One trail goes down into a small hollow, and then steeply up a rocky, bald mountain. Because of this peak's location, the view, though reachable after only an hour's climb, is one of the best in the state.

Taking a different route down, you walk through an open forest where a distressed pileated woodpecker swoops up and down the slope, looking for something. Soon you come out on a huge lakefront beach, with crashing whitecaps. An astonishing, empty spot. The lake, at least a few miles long, regales in untouchedness at first, but with binoculars I see that in the distance, on every point, someone is sitting quietly. A few canoes are moored. The lake is getting use, but quiet use, just enough use, so it still sings of wildness.

I strip down and dive into the cold whitecaps, swimming over some shallow sawgrass by the shore, then on into the depths with their swells and foam. I feel enough alone, and what's remarkable is that the beach is just a half-mile from the parking lot I started from, up an old woods road. When this area was "improved," they decided *not* to extend the new road down to the water. To get there, you still have to walk. This choice was made to keep the spot just a bit more wild. This wouldn't have happened in a national park. This would have been turned into a roadside destination. A big parking lot, interpretive signs, instructions for everything.

Of course it would have. National parks are about accessibility for all people, bringing the wilds within reach. It was Edward Abbey who proposed in *Desert Solitaire* that if we really respected our parks, we'd keep the parking lots outside their borders and insist that those who wanted to enter leave their automobiles outside the sacred line. He wrote that in the sixties; wilderness is still a powerful but fragile thing. True, one ought to be able to get a taste of it from behind the windows of a machine, but inside wilderness we need to flee from the carapaces around the loose human soul. You have to walk, run, or swim into it and not feel all is human around you. To be human inside the more-than-human, that's the goal. We need to preserve this possibility, but not spend too much effort in advertising. Some work must be necessary to strip down and discover beauty; as Spinoza ended his *Ethics*, "All things excellent are as difficult as they are rare." We have had the tendency for centuries to muck things up, to take the road just that extra bit farther than it was ever meant to go, in the name of openness and progress and ease and the inevitable....

Wilderness protection requires restraint, discipline, and thinking beyond oneself. Hopefully not that endlessly Protestant

kind of restraint that can become so regimented and dull. It is the restraining of one kind of human ingenuity in favor of a parallel human ability to care, to let go, to feel the buoying force of the wild world around. No amount of information will take you there, and no amount of safety brought by trail markers and signs telling you what to do at every turn. There must be some doubt allowing you to look beyond what the instructions tell you, like everything you take the time to discover for yourself.

THEN, TO A THIRD PLACE, DOWN A LONG DIRT ROAD IN the middle of a peninsula extending out to the sea. It's a wildlife refuge, so from the designation we know it's not just for humans. Many wildlife refuges exist specifically to preserve game-bird stock for hunters, but not this one. No hunting allowed. Several short trails, this time with interpretive signs, many about how to photograph wildlife, as the project has been set up to honor a famous photographer who recently passed away. These amenities, though, are only on one small section of the reserve. The rest is accessible without trail, the coast to be explored when the tide is low, the inland to be bushwhacked through.

It was a hazy day of low hanging clouds that occluded the horizon. Sea and land blurred together into the distance. The tide was way out, and I made a shortcut through mudflats while my feet sank deeper into the muck. Plenty of birds, from gulls to herons to tiny sandpipers, running on the ground and not sinking in a bit.

I stopped for a while to consider the harmony of a seaside bog, beach on three sides, with winds rustling through small jack pines. Against the gravel the sea beat slowly; in the grasses, a special duet among grasshoppers or cicadas. Above, a soft whistle in the pine needles. In the distance, the regular call of a foghorn on a barrier island, barely audible. Still human out there somewhere. One reason to keep walking, walking on, far down the coast and off the trail, not to find silence but to discover a complete chorus of sound that admits human presence but only in deep moderation, where our footsteps on the pebbles are just one part of the swaying, blowing whole world.

THIS PLACE IS AN ALMOST UNPUBLICIZED NATIONAL wildlife refuge. The first area I visited is a preserve owned by The Nature Conservancy. The second is a state-owned and managed multi-use area. In all of them the individual traveler can feel she is deep in the wilds, in a way that is far more difficult to achieve in the state's lone national park.

But, one might argue, the Maine Woods are a huge area, a sprawling expanse, an easier place to run into moose than to see other travelers. If a national park, will this sense of space be maintained? Why compare it to tiny Mount Desert Island with its summer mansions and tourist towns? True, they are not the same kind of places. But think of Baxter State Park, surrounding Maine's magnificent Mount Katahdin. It remains wild because it is uniquely and quietly preserved by special dispensation, with the population of human visitors monitored and overuse carefully prevented. It's already a tough job. If it were a national park, it would be loved to overuse. As a nation we are not very good at spreading out to take the less beaten path—we want to go mostly where everyone else has been. Why shouldn't we have the right? It's supposed to be a free country. But when it comes to wildness, you earn the right to experience it when you know how to walk softly past its borders.

America's national parks are some of our greatest assets. They are known the world over and are the destination of countless pilgrims from distant countries, who often care little for our cities but know that the wild parks offer something they don't have closer to home. But with public recognition comes the demand to make places available to all who merely hear about a new wild place to visit.

A Maine Woods National Park? Will we be able to refuse a Maine Woods Luxury Lodge and a Maine Woods National Scenic Drive and a Maine Woods Mega-Moose Parking Lot? Who will this park be for? How will it be advertised? You could easily say that it is only small parts of national parks that are routinely destroyed by overuse, but often it is the most beautiful parts, from Ocean Drive to Yosemite Valley.

If Maine's north woods do become a national park it must be a different kind of national park from any we have yet seen in the East. Managed not for world tourism but for the beauty of Nature itself. A few of our parks are conceived of in this way, but not most of them.

This is a plea for preservation, but for quiet preservation. If we create a Maine Woods National Park it should be a place underdeveloped, kept mostly wild, publicized no more than it needs to be. Protect it for the value of the wild things and places that thrive there, not for the possible experiences of us humans alone.

We need to mature enough as a nation to preserve land not just for our own enjoyment, but for the greater integrity of wildness itself. Come to visit anytime—if you are gentle and patient enough to find the way in. ☾

David Rothenberg *is associate professor of philosophy at the New Jersey Institute of Technology and the author of* Hand's End: Technology and the Limits of Nature *and* Is It Painful to Think? Conversations with Arne Naess.

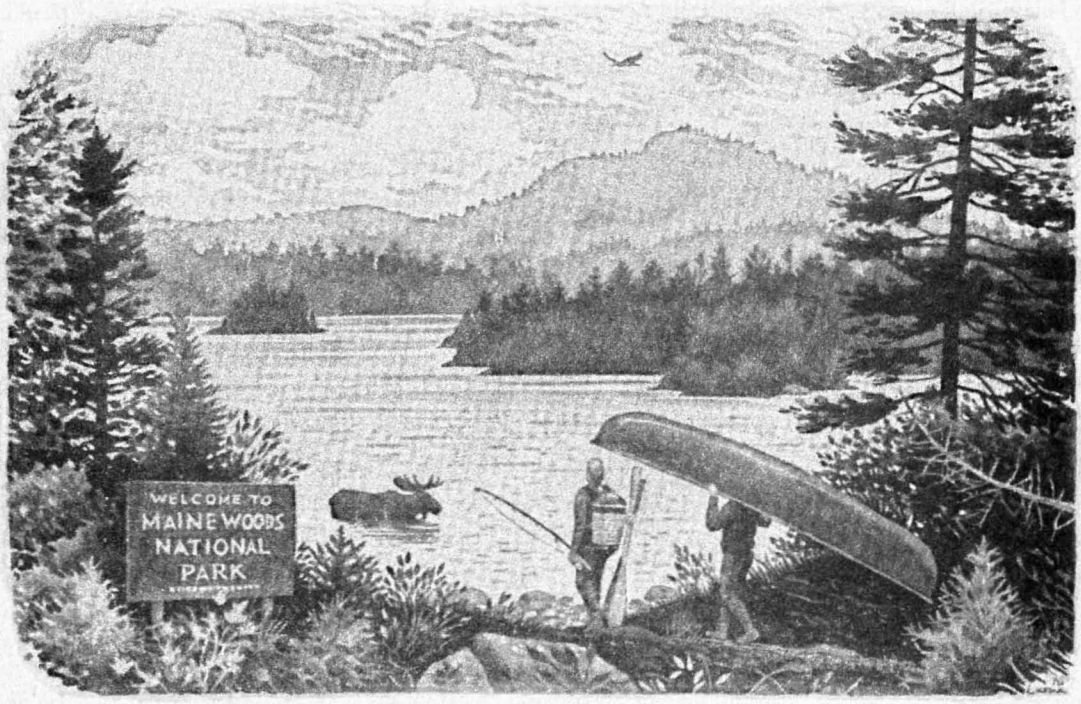
Maine Woods National Park

The Best Way to Restore the Wild

by Michael J. Kellett

The fundamental purpose...[of national parks] is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

—National Park Service "Organic Act," August 25, 1916



The proposed Maine Woods National Park and Preserve—a 3.2-million-acre public reserve that would be larger than Yellowstone and Yosemite combined—would stand alongside our greatest existing national parks, such as Denali, Everglades, and Olympic, as one of America's wilderness crown jewels.

illustration by Jon Luoma

Last Chance to Save the Maine Woods

The Maine Woods is the largest remaining wildland east of the Rocky Mountains. Generations of logging activity have diminished the region's natural integrity. Yet the largely wild character of this great forest survives, offering one of the best opportunities in the nation to restore an entire landscape to ecological health.

This opportunity is quickly fading. As the global economy has expanded, absentee corporations and investors have gained control of the region. They are overcutting the forest, subdividing real estate, and engaging in a frenzy of land sales—roughly five million acres of Maine timberland have changed hands in the last two years. They have mechanized or exported thousands of jobs, with disastrous consequences to local communities.

Concerned citizens and groups have begun to address the threats. Some conservationists hope to improve logging practices through "green" certification and stronger forestry regulations. Some seek to halt undesirable development through state acquisition of sensitive lakeshores and easements on private timberlands. Others are working to protect key tracts as state and private conservation lands.

These are positive steps, but they are not enough. We need much bolder action if we are to save the full range of public values that make the Maine Woods such an extraordinary place. We need a Maine Woods National Park & Preserve (MWNP).[1]

Benefits of a Maine Woods National Park

After exploring the Maine Woods a century and a half ago, Henry David Thoreau wrote that this vast wilderness should become a "national preserve."[2] The proposed Maine Woods National Park & Preserve—a 3.2-million-acre public reserve that would be larger than Yellowstone and Yosemite combined—is worthy of Thoreau's vision. This magnificent park would stand alongside our greatest existing national parks, such as Denali, Everglades, and Olympic, as one of America's wilderness crown jewels.

One can easily make impassioned arguments for a Maine Woods National Park. But the most compelling reason to create the new park is that it *simply makes sense*. It is a reasonable, politically achievable objective that can:

1) restore and permanently protect the native wildlife and ecosystems of the Maine Woods;
2) guarantee access to a true Maine Woods wilderness experience;
3) safeguard and tell the story of the cultural heritage of the Maine Woods;
4) provide a solid foundation for a healthy northern Maine economy; and
5) rally the support of the American public to save the heart of the Maine Woods.

1) A national park can restore and protect the ecology of the Maine Woods. Thoreau described the Maine Woods—much of which was still public land when he visited in the mid-1800s—as "primeval, untamed, forever untameable Nature."[3] Today, the region is largely undeveloped, but biologically impoverished by decades of unsustainable logging. The majestic, primeval forest has become a private "managed forest"—analogous to a farm—dedicated to commercial crops of timber and fiber. Industrial exploitation has already driven out several native wildlife species and endangers a number of others.

Conservation biologists agree that to sustain native biological diversity, we need an extensive network of large wilderness preserves, habitat linkages, and sustainably managed buffers. Maine does not now have any major pieces of such a network. Less than six percent of Maine is publicly owned—one of the smallest proportions of any state—and most of this is open to logging and other industrial uses. Just one percent of the state is protected wilderness. Most existing private preserves are small and inadequate for preserving biodiversity. Industrial forest owners are driven by short-term profits, not ecosystem health.

The proposed Maine Woods National Park & Preserve is the only current initiative that could restore and permanently protect the full range of native wildlife and ecosystems in the Maine Woods. The national park would be an ecologically viable unit, surrounding the state's largest wilderness (Baxter State Park), embracing the headwaters of five major rivers, including enough habitat for wide-ranging predators, and containing a broad variety of ecosystems. Eventually, the park could be an anchor for a vast ecological reserve network that reaches west to Adirondack Park, north into Canada, and south along the Appalachian Mountains.

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1. For a more detailed description of the actual park proposal, see the brochure, *Maine Woods Proposed National Park and Preserve: A Vision of What Could Be*, RESTORE: The North Woods, 1994, and *America's Next Great National Park: Preserving Our Maine Woods Legacy*, RESTORE: The North Woods, 1999.
2. Thoreau, Henry David, "Chesuncook," in *The Maine Woods*, published 1864.
3. Thoreau, Henry David, "Ktaadn," in *The Maine Woods*, published 1864.

Maine Woods National Park would be a restoration park, like Great Smoky Mountains, Redwood, Shenandoah, and Voyageurs. Private lands within park boundaries would be acquired by the public from willing sellers. Logging and other industrial uses would be phased out, and past damage would be healed. Eventually, the old-growth forest would return, providing the full range of wildlife habitats, recovering natural ecological and evolutionary processes, producing clean air and water, and mitigating global warming by sequestering massive amounts of carbon.

Such a nature preserve would allow wildlife to once again live wild and free, without artificial human manipulation. Imperiled species such as the Canada lynx, northern bog lemming, wood turtle, and Atlantic salmon would have a chance to recover. Extirpated species such as the wolf, cougar, wolverine, and woodland caribou could be restored. Prey species such as moose, deer, and beaver would benefit from natural predator-prey relationships.

As with existing national parks, Maine Woods National Park would be protected in perpetuity. Today, 128 years after becoming the first national park on the planet, Yellowstone is so healthy that it is considered an ecological benchmark. Indeed, with the recent reintroduction of wolves, the Greater Yellowstone Ecosystem may well be the most ecologically intact landscape in the lower 48 states. Given time, the Maine Woods Ecosystem could be the Yellowstone of the East.

2) A national park can guarantee access to a true Maine Woods wilderness experience. Instead of a national park, the Maine Woods is becoming an industrial park. The present timberland owners consider public recreation a nuisance to be tolerated. When they do come, visitors see a landscape scarred by clearcuts, roads, logging yards, and gravel pits. They are never far from the sights, smells, and noises of logging trucks, cars and trucks, snowmobiles, motorboats, and airplanes.

The tradition of free public access is dying. Now, a visitor must pass through a tollgate to reach much of the region. Moreover, it often costs more to visit Maine's "working forest" industrial park than to visit a protected national park.

The big wilderness of the traditional Maine Woods stretched from horizon to horizon with no sign of human development. Today, there is no big wilderness in the Maine Woods. The Appalachian Trail and Allagash Wilderness Waterway are only narrow corridors, with massive clearcuts and roads just beyond a thin "beauty strip" of trees. Baxter State Park is a spectacular place, but it is too small—filled to capacity in the summer and increasingly surrounded by clearcuts and roads. No other public and private lands in the state can offer a real Maine Woods wilderness experience.

The proposed Maine Woods National Park & Preserve would restore big wilderness to the Maine Woods. This vast new park would be more like the great Alaskan parks than those in the lower 48 states. Much, perhaps most, of the area would be designated as a national park with a large core of wilderness. The backcountry recreational possibilities would be endless. The rest of the area would be a national preserve, which could accommodate snowmobiling and hunting. These uses would be carefully managed to avoid conflicts and ecological degradation.

The Maine Woods National Park would be one of our least crowded national parks. Contrary to the popular myth that national parks are "loved to death," this would be a place for solitude and wilderness recreation. Unlike often-crowded Acadia, which is one of our smallest national parks (only 40,000 acres in size), Maine Woods would be one of our largest, encompassing an area the size of Connecticut. The new park would need *200 million* annual visitors to be as crowded as Acadia. A more likely estimate is three million visitors per year,[4] a density similar to wild and uncrowded parks such as Canyonlands, Great Basin, and Voyageurs.

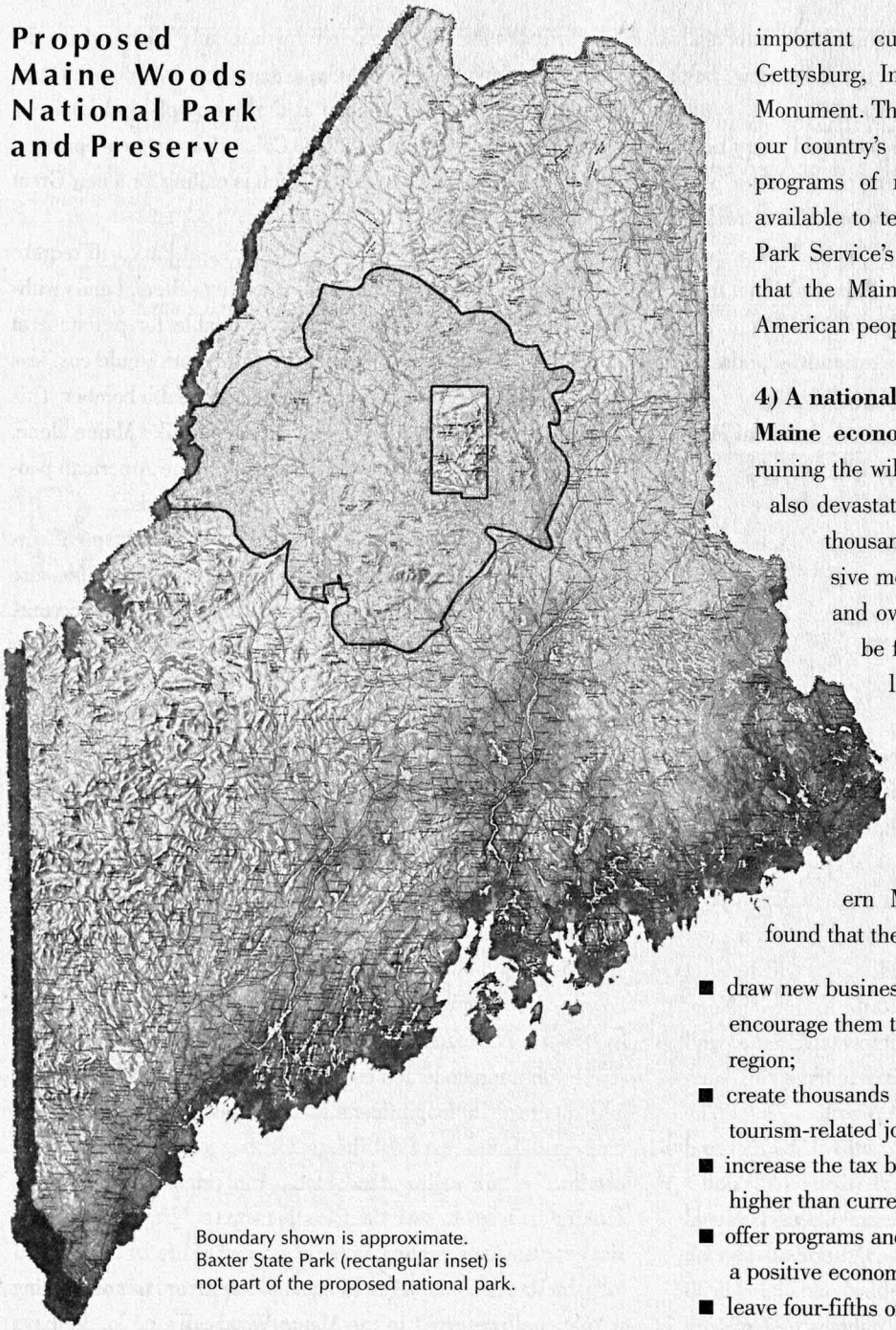
3) A national park can interpret Maine's cultural heritage. The Maine Woods has one of the most compelling stories to tell of any wild place in the country—but few people have heard this tale.

Native Americans lived in the Maine Woods for millennia, leaving behind ancient flint quarries, trails, and evocative place names such as Allagash, Munsungan, and Umsaskis. Europeans came to cut the great forest, establish the timber and paper industries, and build the railroads. Adventurous people have come as well, including Benedict Arnold, Henry David Thoreau, Frederic Church, Theodore Roosevelt, Percival Baxter, Myron Avery, and Justice William O. Douglas.

The proposed Maine Woods National Park is the only existing initiative that would safeguard and tell the story of the cultural heritage of the Maine Woods. The new national park would restore and protect the wild, open landscape that has drawn people to the region and the sites, artifacts, and tra-

4. Kellett, Michael J. and James A. St. Pierre, *Gateway to a Healthy Economy: The Proposed Maine Woods National Park and Preserve and the Future of the Moosehead Region of Maine*, RESTORE: The North Woods, April 1996.
5. Ibid.

Proposed Maine Woods National Park and Preserve



Boundary shown is approximate.
Baxter State Park (rectangular inset) is not part of the proposed national park.

ditions that they left behind. The proposed park would invite people to learn about the Maine Woods through visitor centers, guidebooks and maps, displays, self-guided trails, and ranger talks. Finally, the park would encourage people to experience the Maine Woods story by exploring the vast wilderness on their own.

The National Park Service is well prepared for the challenge. The Park Service cares for some of the world's most important cultural sites, such as Mesa Verde, Gettysburg, Independence Hall, and the Washington Monument. The National Park System comprises one of our country's major educational institutions, making programs of research, interpretation, and education available to tens of millions of people each year. The Park Service's vast skill and experience would ensure that the Maine Woods story is finally heard by the American people.

4) A national park can anchor a healthy northern Maine economy. Economic globalization is not only ruining the wilderness values of the Maine Woods, it is also devastating the regional economy by eliminating thousands of woods and mill jobs through excessive mechanization, foreign labor, mill closures, and overcutting of the forest. Unless a way can be found to replace these jobs, the region is likely to face continuing economic decline.

The proposed Maine Woods National Park & Preserve is the only present plan that could lay the foundation for a healthier, more diverse northern Maine economy. A preliminary study[5] found that the new park has the potential to:

- draw new businesses and permanent residents, and encourage them to make a long-term investment in the region;
- create thousands of new professional, service, and tourism-related jobs;
- increase the tax base, since federal payments are typically higher than current property tax payments;
- offer programs and financial resources needed to promote a positive economic transition in local towns; and
- leave four-fifths of Maine's commercial forest land available for the creation of a sustainable timber industry.

A Maine Woods National Park would not solve all the economic problems facing northern Maine. It could, however, mark the beginning of a transition to a healthy, diverse economy for the region.

5) A national park can rally Americans to save the Maine Woods. Some people say creating the proposed Maine Woods National Park & Preserve is politically impossible. They say that it is too radical a change. They say that it is too controver-

sial, opposed by anti-park zealots and powerful special interests. They say that it would cost too much to buy and manage. They say that it will never be supported by local people.

These are the same things that have been said every time a new national park is proposed. Conservationists who proposed Big Bend, Everglades, Grand Canyon, Great Smoky Mountains, North Cascades, Olympic, Redwood, Wrangell-St. Elias, and almost every other national park were told that they had an impossible dream. Yet the bold vision of each new national park caught fire and continued to grow until the dream became a reality.

The "impossible" dream of a Maine Woods National Park can also become a reality. Paradoxically, the fact that the proposed park is so big and bold can actually make it *easier* to create. Less ambitious state and private protection initiatives are certainly important, but they are unlikely to inspire broad public support outside a given region. The creation of America's next great national park in the Maine Woods can generate nationwide excitement and support that would benefit this and other land protection efforts.

RESTORE: The North Woods has been leading a growing national movement for a Maine Woods National Park. Thus far, 75,000 citizens, representing every state, have signed a petition calling for a park feasibility study. Over 300 businesses and 100 nonprofit organizations across the nation have lent their support. More than 75 prominent Americans have signed onto a park advisory committee, including Harry Belafonte, David Brower, Paul Hawken, Roger Kennedy, Mardy Murie, Reed Noss, Robert Redford, Michael Soulé, Terry Tempest Williams, and Edward O. Wilson. The park proposal has received national media attention, including coverage by the *New York Times, The Washington Post, USA Today, The Atlantic Monthly,* and National Public Radio.

This broad public interest in the Maine Woods National Park proposal should come as no surprise. Americans cherish our national parks and readily support new parks. In 1998 alone, the National Park Service recorded almost 287 million visits to 347 park areas, up from 273 million in 1993.[6] People are voting with their feet, and their vote is overwhelmingly in favor of national parks.

The establishment of a Maine Woods National Park requires the passage of federal legislation. Fortunately, after a long dry spell the Congress is taking its cue from the public and once again creating new parks. Our newest national park, Black Canyon of the Gunnison in Colorado, was established in 1999. The bill was introduced and enthusiastically endorsed by the state's conservative Republican senators and conservative Republican local congressman at the urging of local business leaders, newspapers, and citizens. Coloradoans were so pleased with the results that a similar coalition is calling for a new Great Sand Dunes National Park.

The creation of a Maine Woods National Park will require the acquisition of private lands from willing sellers. Lands within the proposed park are regularly available for purchase at about $300 per acre. At this rate, the entire park would cost less than $1 billion—cheaper than a single B-2 stealth bomber. This price is beyond the resources of a small state like Maine alone. However, with the support and generosity of the American people, it is quite feasible to raise the necessary funds.

The creation of a new national park is one of the great acts of American democracy. By their very nature, our parks are places of national importance, places that welcome everyone, places that are our legacy to future generations. Proposals for new public parks must have strong public support to pass through the hurdles of entrenched special interest opposition, congressional legislation, and signature by the President. In cases where national park land must be acquired from private owners, the funds are usually raised through a partnership between government, conservation-minded philanthropists, and countless people across the country. National parks are gifts we give to ourselves; each time the ribbon is cut on a new park, there is reason to celebrate.

Now is the Time for Action

Today, an unprecedented convergence of events makes it possible to create a magnificent Maine Woods National Park & Preserve. The forest is still intact enough to be restored. The landowners are selling land at bargain prices. The public is looking for ways to save the forest, ensure public access, revive the economy, and protect a cherished way of life.

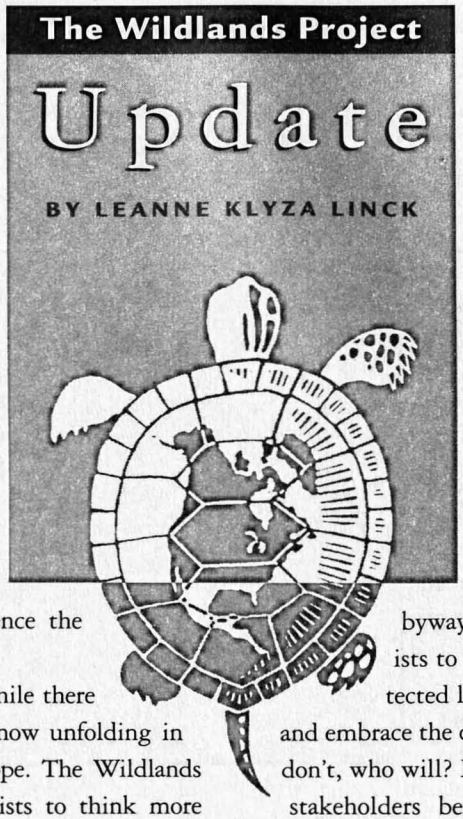
In Thoreau's day, Americans had the luxury of not creating a "national preserve" in the Maine Woods. We no longer have that luxury. We need a Maine Woods National Park and we need it now, before the opportunity is lost forever. ☾

Michael Kellett *is the cofounder and executive director of RESTORE: The North Woods (PO Box 1099, Concord, MA 01742; 978-287-0320; restore@restore.org), a regional nonprofit organization working to restore and preserve big wilderness and native wildlife to the North Woods.*

6. *National Park Service Statistical Abstract,* National Park Service, Department of the Interior, 1993 and 1998.

THE WILDLANDS PROJECT IS PLEASED TO ANNOUNCE *the hiring of Leanne Klyza Linck as its new executive director. Leanne is passionate about protecting wildlife and wild places across North America. A native of the Northeast, she especially loves the Adirondacks and the wilderness of northern New England. Leanne's passion is backed by an impressive array of skills developed in previous positions with the Sierra Club and Northern Forest Alliance. She and her husband Bob Linck and their two children relocated to Tucson this March so she could head TWP's office there. Leanne knows the conservation community and knows how to get things done. She will work closely with Chairman Dave Foreman and Science Director Michael Soulé as part of the senior management group of The Wildlands Project.*

—Harvey Locke, President, The Wildlands Project



Before reading the following article describing the proposed Maine Wildlands Network, I urge the conservation community to dream. Dream of what Maine used to be and could be again. For a moment forget about current land ownership patterns and entrenched political power. Forget about corporate control and property rights zealots. Consider the possibilities for Maine's wild future. Think about a landscape where wolves, lynx, and northern goshawks roam a vast wild forest, where eagles soar above rivers running thick with Atlantic salmon, where our children can experience the splendor of true wilderness.

Such a dream is not out of reach. While there are a number of conservation initiatives now unfolding in Maine, most are relatively modest in scope. The Wildlands Project encourages regional conservationists to think more boldly, and to use our scientific research to help prioritize land purchases and other protection strategies in Maine as others are doing across the continent.

A long-time conservation priority, Maine has been a focus of national attention since the sale of roughly one million acres of Diamond International lands drew attention to the Northern Forest region in 1987. In the years since, the scale of industrial forest land sales has accelerated; nearly five million acres of Maine forests have changed hands in the last two years.

Maine has the smallest proportion of public land of any forested state—only 6%, with only a fraction of that protected as wilderness. The timber and paper barons have mined an enormous quantity of wood fiber since the nineteenth century, leaving the landscape fragmented and wounded. The good news is that public support for land conservation and recovery of large carnivores is gaining momentum in Maine. The Wildlands Project, building on this trend, has developed a visionary proposal to begin restoring the region to ecological health.

Dozens of people have contributed to the Maine Wildlands Network proposal, which will help guide conservationists, policy makers, and the public toward implementing strategies that will fully protect biological diversity, not simply beauty strips and scenic byways. It is our responsibility as conservationists to communicate the suite of values that protected lands provide, and help society understand and embrace the concept of wilderness. We must lead. If we don't, who will? It is inherent in public policy debates that stakeholders become polarized and advocate different strategies. While this may be inevitable, wildlands advocates should offer a bold vision—articulating first the needs of Nature—not constraining our agenda to what seems politically possible in the short term.

Intensive human activity over the last 200 years has taken its toll on the great North Woods and we will not reverse this trend or heal the wounds in a ten-year campaign. It will take decades to rewild Maine—and courage to confront the obstacles of the hour. Public policy debates are about differences of opinion. Into this debate The Wildlands Project offers a comprehensive, scientifically defensible conservation plan that can steer the conversation towards legitimate ecological needs for a healthy and wild future.

Maine Wildlands Network

A SCIENCE-INFORMED CONSERVATION VISION FOR MAINE

"Maine Woods," by Jean Cannon

by Robert Long and Paula MacKay

What is most striking in the Maine wilderness is the continuousness of the forest, with fewer open intervals or glades than you had imagined. Except the few burnt lands, the narrow intervals on the rivers, the bare tops of the high mountains, and the lakes and streams, the forest is uninterrupted.

—Henry David Thoreau, THE MAINE WOODS (1864)

MAINE IS RENOWNED for its rich natural diversity. As large as the other five New England states combined, Maine's more than 22 million acres comprise a broad range of physical features, including the dramatic Atlantic coastline, the legendary Maine Woods, extensive peatlands, an estimated 32,000 miles of flowing waters, and nearly 6,000 lakes. Remarkably, with more than 90% of its landscape covered by forest, Maine is the most heavily forested state in the nation. Furthermore, many of Maine's diverse ecosystems, while not untouched, remain largely intact (McMahon 1998). Despite its spectacular beauty and predominantly wooded condition, however, Maine has been severely fragmented by industrial logging and the far-reaching effects of human development (Gawler et al. 1996). The mission of the Maine Wildlands Network (MWN) is to establish a system of core areas and linkages that will protect and restore the long-term ecological integrity of Maine (see Table 1).

Background: The Making and Breaking of a Landscape

The late-Wisconsin-age glacier is believed to have first entered Maine after advancing southeastward across the St. Lawrence lowland about 25,000 years ago (Bennett 1988). For many centuries, glacial ice gouged its way across the state, terminating on the continental shelf region currently occupied by the Gulf of Maine. By 9,000 years ago, the Wisconsin glacier had completely melted in Maine, leaving a newly sculpted landscape in its wake. Emerging vegetation progressed through a continuum from tundra to woodland to forests (Davis and Jacobson 1985), eventually leading to the complex plant assemblages and associated fauna we see today.

Prior to European contact and settlement, aboriginal peoples lived throughout much of the land we know as Maine. Heretofore, disturbance was relatively localized and infrequent (Krohn et al. 1998). Indeed, European explorers such as British physician and botanist John Josselyn encountered what they perceived as endless wilderness when they first entered the North Woods: "[The land beyond the White Mountains is] full of rocky Hills, as thick as Mole-hills in a Meadow, and cloathed with infinite thick Woods" (Josselyn 1672, cited in Bennett 1996). The forests of these early days were largely mature; in north-central Maine, an estimated 59% of the forest featured trees at least 150 years old, and 27% consisted of an all-aged old-growth mosaic, with some trees older than 300 years (Lorimer 1977). But by the late 1700s, extensive harvesting of Maine's forests had begun in earnest (Bennett 1996). Upon reaching the Mattaseunk stream and mill in 1846, during his excursion to Mount Ktaadn (as he spelled it), Thoreau was moved to write: "Here were thousands of cords ...which only cumbered the ground and were in the settler's way. And the whole of that solid and interminable forest is doomed to be gradually devoured thus by fire, like shavings, and no man be warmed by it" (Thoreau 1988).

Maine produced an enormous quantity of lumber in the last decades of the nineteenth and the first decades of the twentieth century. The timber barons who accumulated extensive private holdings in the nineteenth century were largely succeeded by corporate industrial landowners in the twentieth century. Many forest products companies achieved vertical integration, owning the forests and mills, as well as employing the workers who cut the wood, moved it to the mills, and turned the trees into pulp and paper or lumber. This scenario provided (and continues to provide) industrial landowners great leverage over costs and prices (Falk 1973, Osborn 1974, St. Pierre 1976, Lansky 1992), and enormous political and economic influence in fending off recurring calls for more land to be protected in public reserves (Hakola 1981, St. Pierre in prep).

From 1952–1992, industrial pulp, paper, and lumber companies added 1.4 million acres to their holdings in Maine (Irland 1999). Today, industrial and other large private landowners with timber interests hold approximately 57%, or nearly ten million acres, of Maine's commercial forest (St. Pierre pers. comm.). This is the greatest such concentration of land ownership of any state in the US. With the sale of nearly five million acres of Maine's forestland in the last two years, the ownership mix is shifting, but the total large timberland holdings have not declined dramatically (St. Pierre 1999a,b). The historical pattern of large land ownership in Maine has been a double-edged sword for conservation goals: it has minimized development in vast areas of the landscape, but intensive forest management practices including clearcutting and road building have resulted in extensive habitat fragmentation (Maine Forest Service 1999a).

Today, with a human population of less than 1.25 million, Maine is the least densely populated state east of the Mississippi (Brandes 1998) (see Fig. 2). Approximately half of the population lives in the eight coastal counties, mostly in the southwest portion of the state (Maine Environmental Priorities Council 1999). In contrast, the northern part of the state, a ten-million-acre remnant of Thoreau's Maine Woods, represents the largest block of undeveloped, largely unpopulated land in the eastern US. This area hosts fewer than 12,000 year-round human residents—less than one-tenth the population of New York's six-million-acre Adirondack Park. Many townships in the heart of the Maine Woods have no permanent residents (Land Use Regulation Commission 1997).

Although Maine has outstanding conservation potential, only 0.09% of the land is federally designated Wilderness. Indeed, Maine has the smallest proportion of public land of any forested state (Irland 1996), with approximately 94% in private and corporate ownership (Krohn et al. 1998). Taken

together, public and private conservation lands comprise less than 6% of Maine, with only 1.2% strictly protected (i.e., GAP Code 1 in Krohn et al. 1998). The vast majority of Maine's conservation lands are geographically isolated parcels less than 200 hectares in size. Furthermore, most state lands are developed for intensive recreation, used for logging, and/or open to other consumptive uses. Although nonprofit conservation organizations have protected some valuable habitat in Maine, these lands currently amount to only 45,000 acres.* In sum, more than 98% of Maine's landscape is managed for forestry or agriculture, or is used for residential, commercial, or industrial development (McMahon 1998).

Maine's Biodiversity Today

The Maine Natural Areas Program has cataloged 121 different ecosystem types, including 25 types of forests, forested wetlands, and woodlands; 30 types of non-forested wetlands; 25 types of open lands (shorelands, cliffs, and high altitude areas); and 41 types of lakes, rivers, marine, and estuarine systems. (MEPC 1999). This immensely diverse region provides habitat for an estimated 50,000 species of wildlife (Maine Forest Service 1999b), including 54 extant land mammals, 218 breeding birds, and 17 each of native amphibians and reptiles. Because of Maine's location in the temperate-to-boreal transition zone, it has steep environmental gradients and many species at the edge of their range. These peripheral populations may serve as important reservoirs of genetic diversity (Gawler et al. 1996).

The forest ecosystems of northern Maine are characterized by a cold temperate climate, abundant moisture, poorly drained soils, and a short growing season. Conifers are well suited to this harsh environment and dominate the northern two-thirds of the state (Bennett 1988). Predominant species include balsam fir and red, black, and white spruce, which together comprise an estimated 70% of the evergreens. Northern hardwoods, especially sugar maple, beech, and yellow birch, are scattered throughout. In the more mild conditions of southern Maine, dominant oaks are accompanied by other hardwoods such as shagbark hickory, red maple, and gray birch (Bennett 1988).

Threats

Maine's natural legacy is at risk from unsustainable forest management (Lansky 1996, Maine Forest Service 1998), sprawling development (O'Hara 1997, Maine State Planning Office 1998), and climate change (Simmons and Bates 1995, Cronan et al. 1998). Currently, most of Maine's forests are comprised of immature, shade-intolerant tree species (Griffith and Alerich 1996), with older forests of all types becoming uncommon across the state (Gawler et al. 1996). According to a recent study by the Maine Natural Areas Program (MNAP), 8 of the 25 forest community types in Maine are rare, with the remainder lacking good natural examples (Gawler et al. 1996). The MNAP report also states that Maine's native plant diversity has declined over the past century; at least 32 species have been extirpated. Losses in plant biodiversity are attributed to several human-induced factors, including permanent land conversion, introduced species, timber harvesting, recreational use (e.g., off-trail use of all-terrain vehicles), damming, and native plant collection.

Unfortunately, Maine's aquatic ecosystems have fared no better. As stated in the MNAP report: "Aquatic ecosystems in Maine have been profoundly and adversely affected by exotic introductions [exotic species have been found in almost all Maine lakes], dam building, pollution, pesticide use, and excessive nutrient input..." (Gawler et al. 1996). Furthermore, the Maine Environmental Priorities Council has determined that many waters are threatened by (1) the filling of wetlands and non-point-source pollution associated with sprawling patterns of development, (2) contamination from septic systems, storm water runoff, sewer overflows, and atmospheric deposition of mercury, and (3) the discharge of toxic substances and dioxin (MEPC 1999). More than 50% of the region's original marshes have been lost through human activities, with losses of all Maine wetlands as high as 20% (MEPC 1999).

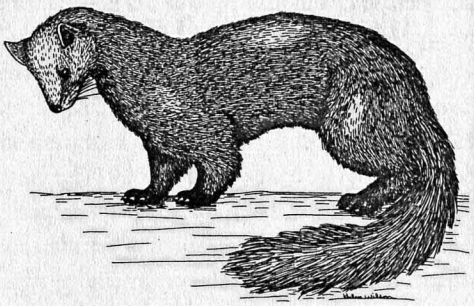
The alteration of terrestrial and aquatic ecosystems and processes, coupled with direct exploitation of wildlife, has significantly diminished Maine's biodiversity. Four mammal species (cougar, eastern timber wolf, sea mink, and caribou) were extirpated from Maine by 1900 (Gawler et al. 1996), and the status of several others, including the Canada lynx and New England cottontail, is tenuous (Bennett 1988). Evidence from species trends indicates that, while certain habitat generalists may be prospering, other more restricted species are in decline (Gawler et al. 1996). As stated in the MNAP report: "Native species inhabiting early successional forests are generally widespread and abundant; from the limited extent of undisturbed forest statewide we can infer that species requiring undisturbed (or less disturbed) forest habitats have become less abundant." Alas, anthropocentric modification of the landscape is so pervasive that there are no sites in the region for which there is a complete understanding of the natural disturbance regime (Publicover 1994).

Designing a Future for Maine's Wild Species

The Maine Wildlands Network is built around the concept of rewilding. Rewilding is "the scientific argument for restoring big wilderness based on the regulatory roles of large predators" and is characterized by three independent features: large, strictly protected core areas; functional connectivity; and keystone species (Soulé and Noss 1998). Much of the support for the rewilding approach is based on recent studies suggesting that ecosystem integrity is often dependent upon the presence of large carnivores (Estes et al. 1978, Terborgh et al. 1999). For example, evidence suggests that the disappearance of large car-

* The Nature Conservancy recently purchased approximately 185,000 acres in the St. John River watershed, but the future conservation status of this land has yet to be determined.

Table 1.
Goals and Objectives of the Maine Wildlands Network



Goal 1 To recover and protect populations of all focal species (see Methods) and other native species via the:

- ➤ restoration and protection of large core areas;
- ➤ recovery of extirpated species or native species with severely reduced populations through reintroduction or the facilitation of natural recolonization;
- ➤ implementation of public education and outreach campaigns that will result in widespread support for the recovery of persecuted species such as the wolf, Canada lynx, and cougar; and
- ➤ implementation of specific management and conservation actions for each focal species, and for rare, threatened, and endangered species.

Goal 2 To restore and protect functional landscape connectivity for focal species via the:

- ➤ identification and protection of areas important for wildlife movement between identified cores such as feeding areas, stop-over points, and movement zones (including areas with minimal human population and road density);
- ➤ identification and protection of riparian linkages between identified cores and between terrestrial and coastal ecosystems; and
- ➤ implementation of ecological forestry practices in compatible use zones to ensure that these zones help provide effective landscape connectivity for the identified focal species.

Goal 3 To restore and protect large roadless areas and remaining native forest via the:

- ➤ identification and protection of all remaining old-growth forest stands;
- ➤ incorporation of existing large roadless areas into core areas;
- ➤ identification of roads that, if removed, would restore areas to roadless status; and
- ➤ implementation of initiatives and campaigns designed to increase the amount of public or private conservation land in the state (e.g., the proposed Maine Woods National Park and Preserve, outreach to regional land trusts).

Goal 4 To restore and maintain ecological and evolutionary processes, including wildfire, insect outbreaks, predator/prey dynamics, natural succession, and flood regimes, via the:

- ➤ protection of significant portions of all major rivers and watersheds, especially headwaters, such that they provide for the viability of native aquatic species (e.g., Atlantic salmon populations);
- ➤ identification and removal of any dams whose (ecological and other) costs outweigh benefits;
- ➤ protection of large core areas and landscape linkages such that natural processes are unimpeded; and
- ➤ careful and conservative management of smaller cores to maintain disturbance regimes that mimic natural conditions (e.g., restoration of fire and flood regimes in some areas).

Goal 5 To eliminate or control exotic species via the implementation of a comprehensive management program to control and prevent the spread of exotic plant and animal species.

Table 2.
Elements of MWN's *3-track Approach*

Track 1 SPECIAL ELEMENTS

- ➤ Large roadless and lightly-roaded areas
- ➤ Public and conservation lands
- ➤ Old-growth forest stands
- ➤ Wetlands
- ➤ Areas of potentially high species richness
- ➤ Areas of low human population

Track 2 REPRESENTATION

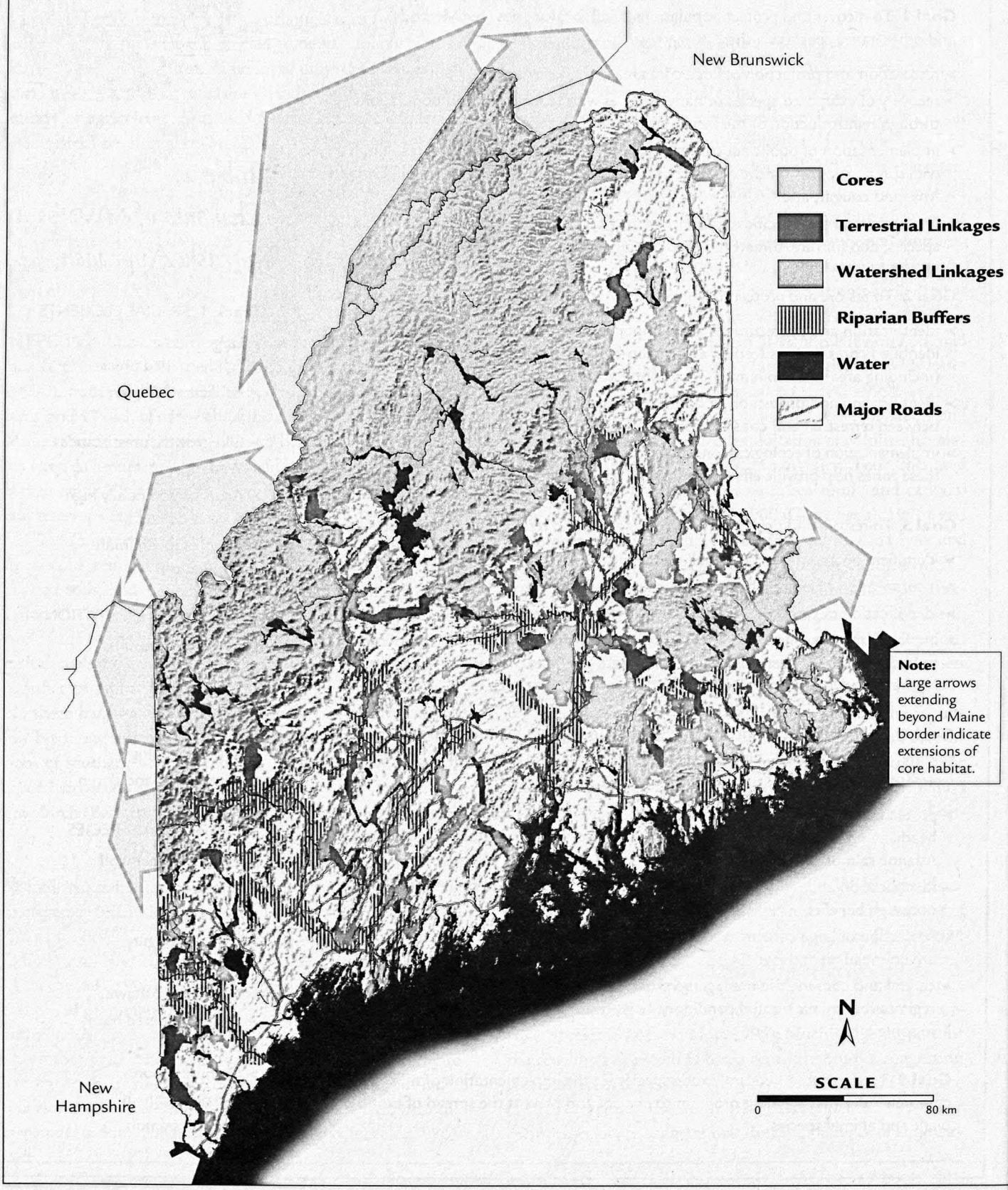
- ➤ Biophysical regions
- ➤ Watersheds
- ➤ Elevations
- ➤ Soils
- ➤ Bedrock geology
- ➤ Vegetation/land cover

Track 3 FOCAL SPECIES

- ➤ Eastern timber wolf
- ➤ American marten
- ➤ Canada lynx
- ➤ Eastern cougar
- ➤ River otter
- ➤ Northern goshawk
- ➤ Red-shouldered hawk
- ➤ Black tern
- ➤ Common loon
- ➤ Bicknell's thrush
- ➤ Atlantic salmon

American marten by Helen Wilson

Fig. 1. Maine Wildlands Network A DRAFT PROPOSAL



maps prepared by Greater Laurentian Wildlands Project

Fig. 2

Human population density

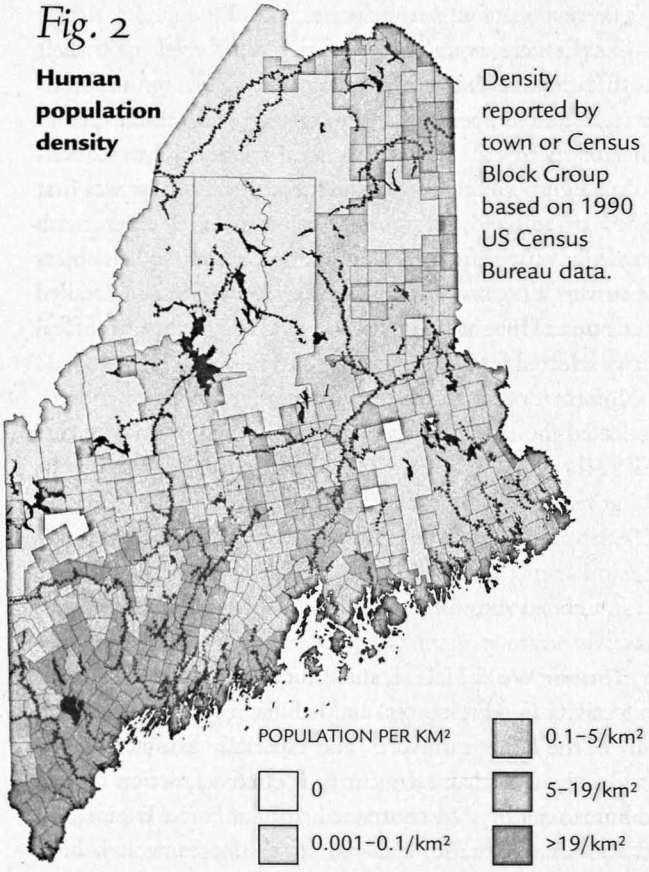
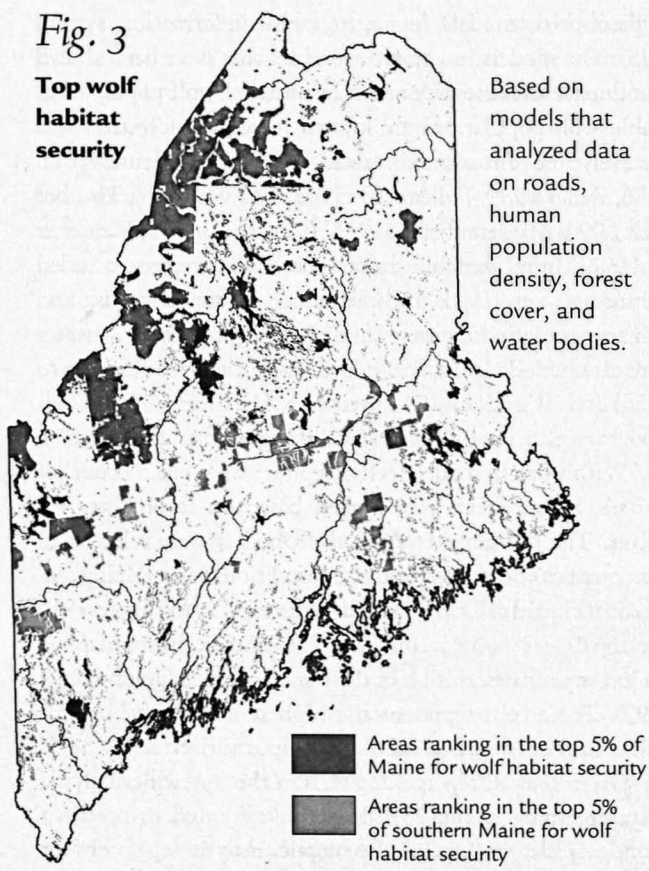


Fig. 3

Top wolf habitat security



nivores often causes ecosystems to undergo dramatic changes, many of which lead to biotic simplification and species loss (Mills et al. 1993). The recovery of Maine's wide-ranging predators is a central component of MWN.

The principles of conservation biology are increasingly being used in the design of protected areas (Scott et al. 1993, Strittholt and Boerner 1995, Noss et al. 1997, Noss et al. 1999). These fundamental principles call for the protection of large blocks of habitat, and the maintenance of *functional* connectivity between them, to allow natural disturbance regimes to operate, to sustain wide-ranging species that require ample habitat for foraging, seasonal movement, and other needs, and to ensure genetic exchange between populations (Noss 1983, Harris 1984, Noss and Harris 1986, Soulé 1987). The Maine Wildlands Network uses the widely accepted core/corridor/buffer model (Noss 1992) of protected areas design, with slightly revised component names (core/linkage/compatible use area). These components can be briefly described as follows:

Cores are extensive, intact wildlands where ecological processes function as naturally as possible. Some management of cores may be necessary to compensate for historical alteration of natural processes (e.g., disruption of natural fire and flood regimes, introduction of exotic species) until a time when processes again function naturally. Core areas are *not* "human exclusion" zones, but, selectively allow for human uses that are compatible with the protection and function of the core. Examples may include hiking, non-invasive research, hunting, and fishing.

Linkages are designed to ensure that large-scale and long-term ecological processes continue operating within fragmented ecosystems, and to facilitate movement of animals (migration, breeding, foraging), plant propagules (seeds, pollen, pollinators), and essential abiotic resources such as water and nutrients. Some linkages have been included specifically to allow for the movement of large carnivores and wide-ranging species.

Compatible use areas are designed to buffer core areas and critical linkages from the ecological impacts of human activities. These lands may be owned and managed through a wide variety of public and/or private programs. While warranting special conservation management, compatible use areas allow for more intensive human uses compatible with the protection of the cores, such as ecological farming and forestry, and light tourism.

Methods

The above components for MWN were selected using the three-track approach outlined by Noss et al. (1997). This approach incorporates:

- **Special elements**—mappable elements of high conservation interest.
- **Representation**—protection of samples of vegetation, community, or physiographic types.

- **Focal species**—organisms used in planning or monitoring core areas or networks because their requirements for survival represent factors important to maintaining ecologically healthy conditions (see Miller et al. 1998 for a complete review).

Incorporating all three tracks into the design process should help to address multiple conservation priorities (Noss et al. 1999). Collectively, these tracks provided a basis for the Maine Wildlands Network design by identifying opportunities and priorities for conservation. A list of the elements within each of the tracks used in MWN can be found in Table 2.

Special Elements

We used special elements in a "building block" approach (Trombulak 1996) to define preliminary cores and linkages. First, the largest roadless areas containing existing conservation lands, and those in townships with no human population, were identified and included as cores. Next, remaining conservation areas in the state were evaluated relative to the location of adjacent roadless areas, wetlands, areas of low human population density, and industrial timberlands. Many of these areas were then added to the previously delineated cores, or included as separate cores, avoiding roads where possible. Finally, known stands of remaining old-growth forest were added to core areas.

Large roadless areas not included in cores were used to help identify linkages between disjunct cores. Watercourses and ridgelines, which often retain intact native vegetation and plant communities, were also used as linkages to maintain some connectivity through areas of significant human development (e.g., much of southern Maine). Linkages based on watercourses were created by extending a buffer from the watercourse to the nearest road on each side in regions with low or no human population, a 500-meter buffer in rural regions, and a 50-meter buffer in urban areas.

Representation

To help ensure inclusion of the complete spectrum of vegetation, natural communities, and physical structure, we overlaid wetlands, major watersheds, elevation, soils, bedrock geology, and focal species' distributions on the draft design throughout the mapping process. As a preliminary evaluation, the completed draft wildlands network will be evaluated with respect to its representation of vegetation/land cover, biophysical regions, major watersheds, and soils.

Focal Species

Ideally, the wildlands network would be evaluated on its ability to protect and restore habitat for viable populations of all native species. As planning for all native species is infeasible, a limited number of focal species were chosen as surrogates. Assuming these species were well selected and effectively represent a broad range of habitat needs, a wildlands network suitable for their long-term persistence should also protect a high percentage of all native species.

Focal species were selected for MWN based upon their identification as one or more of the following: umbrella species, keystone species, flagship species, and habitat quality indicator species. A preliminary focal species list was developed using information from the literature. This list was first refined by selected biologists, naturalists, and others with knowledge of specific species in Maine, and later by an objective survey of regional experts (see Beazley 1998 for a detailed description of the survey methodology). The final suite of focal species selected for MWN is described in Table 2.

Information on the distribution, range, and habitat needs of selected focal species was used to help identify MWN core areas. More detailed methodologies used to incorporate the habitat needs of two focal species, the eastern timber wolf and the Atlantic salmon, are described below. To the extent possible, similar methods will be developed for other focal species and integrated into future iterations of the Maine Wildlands Network.

Timber Wolf. Habitat suitability is a measure of habitat productivity (food resources) and habitat security (safety). For many of the larger carnivores, and especially habitat generalists like the wolf, habitat security is often a function of road and human density. We contracted Ancient Forest Exploration and Research (Ontario, Canada) to conduct a wolf habitat security analysis for Maine (Quinby et al. 1999). For our purposes, suitable habitat was identified by developing a number of descriptive models in a geographic information system (GIS). The models integrated variables that have been shown to influence the integrity and movement of wolf populations. Viable wolf populations are known to require forested areas relatively free of roads and humans (Thiel 1985, Jensen et al. 1986, Fuller 1989, Fuller et al. 1992, USFWS 1992, Thurber et al. 1994, Mladenoff et al. 1995, Corsi et al. 1999, Paquet et al. 1997). Input variables in our models, therefore, included distance to improved roads, distance to major roads, and human population density. Land use and proximity to water were also included as variables because of their relationship to wolf survival and canid movement (Harrison 1992). Each model weighted one of the variables higher than the others.

Within each model, cells (representing one hectare of Maine's surface area) were ranked based on favorability for wolves. The top-ranked cells for all models were selected to form mosaics of the most favorable conditions (e.g., the top 1% mosaic included cells that ranked in the top 1% for any model). The top 1%, 2%, 5%, 10%, and 25% mosaics were mapped (for a complete description of these methods, see Quinby et al. 1999). These cells represent the highest security habitat for wolves in the state based on the five input variables.

Given that all top-ranking cells in the statewide analysis, including those at the 25% level, were located in northern Maine, we also performed the mosaic analysis separately for the southern part of the state. The result was a second set of

mosaics that represent the highest security habitat for wolves in this subregion. In both the statewide and southern regional analyses, the 5% level appeared to maximize area while maintaining selectivity. Thus, we used the 5% mosaics (Fig. 3) to refine the existing cores, identify where new cores might be located, and contribute to terrestrial linkages.

It is important to note that the analysis described above evaluated only habitat security for wolves, and did not address prey density—the other component of habitat suitability. At least one study, however, has estimated current ungulate (deer and moose) availability for wolves in Maine (Mladenoff and Sickley 1998). Viable wolf populations are thought to require deer densities of at least 1 per km^2 (Paquet et al. 1999 as derived from Messier 1994). Based on data from Mladenoff and Sickley (1998), 80% of the area included in the MWN cores had "deer equivalent prey units" (DEPU; deer + moose density where moose = 6 deer) of at least 4 per km^2, and 100% had DEPUs of at least 2 per km^2.

Atlantic Salmon. Because salmon biology and conservation are significantly affected by the integrity of the surrounding watersheds, we used subwatersheds of salmon rivers as the unit of proposed protection and mapping for watershed linkages and riparian buffers.

Rivers supporting runs of Atlantic salmon, and their immediate subwatersheds, were used to help delineate linkages between cores. Subwatersheds of these rivers that did not contain urban, industrial, or dense residential development based on Maine gap analysis land-cover/land-use maps (Krohn et al. 1999) were designated as watershed linkages. Subwatersheds containing these features, and therefore containing more intensive human development, were included as riparian buffers.

When planning for biodiversity conservation, certain focal species should be considered ends as well as means. That is, in addition to their use in planning protected areas, their actual presence in the Maine landscape should contribute to its ecological integrity and wildness. Soulé and Noss (1998) suggest that, "Once large predators are restored, many if not most of the other keystone and 'habitat-creating' species (e.g., beavers), 'keystone ecosystems' (deMaynadier and Hunter 1997), and natural regimes of disturbance and other processes will recover on their own."

Limitations

There are currently a number of limitations to the proposed Maine Wildlands Network, only two of which will be discussed here. First, there is little information relating to the actual quality of habitat within identified components of the wildlands system. Some of the core areas were included due to their wilderness attributes (e.g., remoteness), others because they lack development or roads. Although these areas may not necessarily exemplify "high quality" habitat at present, they will likely revert to high quality status if they are simply protected from over-cutting of timber, road-building, and other habitat-degrading practices. Surveys and ground-truthing of proposed network components should be short-term priorities for this project.

Second, our current design does not represent or integrate all available information relevant to conservation planning in Maine. Data produced by the Maine Gap Analysis Project, Maine Natural Areas Program, The Nature Conservancy, Maine Audubon Society, and Maine Department of Inland Fisheries and Wildlife will allow us to fine-tune our design and, in some cases, provide a measure of how well we can expect the design to meet our objectives. Future iterations of this design should also incorporate Maine Natural Areas Program data identifying clusters of rare, threatened, or endangered species.

Results and Conclusions

Using the approach and methods described above, we designed the draft wildlands network shown in Fig. 1. This design includes approximately 35,596 km^2 of cores, 10,383 km^2 of linkages, and 10,016 km^2 of riparian buffers (compatible use areas have not yet been identified). These areas correspond to roughly 39.2%, 11.4%, and 11.0% of the state, respectively. By comparison, the Maine Forest Biodiversity Project (MFBP) recently published a report identifying potential benchmark reserve sites encompassing 498,700 acres (approximately 2019 km^2) or about 2% of the state's total land area (McMahon 1998). The MFBP report cautions that, even if all of their qualifying ecoreserves were protected, they alone would not achieve maintenance, much less restoration, of biological diversity.

While the detrimental effects of fragmentation on Maine's natural communities and species are well recognized, few state, federal, or private organizations are willing to propose conservation measures at a scale large enough to address the problem. Numerous studies, including the MWN, point to the fact that the quantity and quality of public lands in Maine are inadequate to fully protect biodiversity (Gawler et al. 1996, Krohn et al. 1998, McMahon 1998). Unfortunately, current trends suggest that the situation for biodiversity in Maine will only become more urgent. According to Gawler et al. (1996), "Land-use trends point to increasing fragmentation from development in the southern part of the state and increasing fragmentation and forest simplification from harvest activities, such as shortened rotations, in the northern part of the state." The authors conclude: "Prudence dictates that we begin to develop biodiversity conservation measures now, given the data at hand."

The Maine Wildlands Network is a long-term, science-informed vision to guide and inspire Maine conservationists. The map is meant to be the first step in what must be an iterative process. Detailed planning will need to occur at all scales, from the landscape level to individual parcels of land. Planning and implementation will be incremental, proceeding over decades, and will need to incorporate grassroots participation and a pronounced shift towards sustainable, local economies.

We concur with Noss et al. (1999) that a conservative approach, based upon biological and ecological data, should set the "sideboards" within which socioeconomic options are evaluated, and that "...this approach is in line with the historical observation that human cultures are much more adaptable to rapid environmental change than many non-human species." Maine provides both the opportunity and the mandate for immediate action on behalf of biodiversity. We hope and anticipate that the Maine Wildlands Network will help to set the stage for such action.

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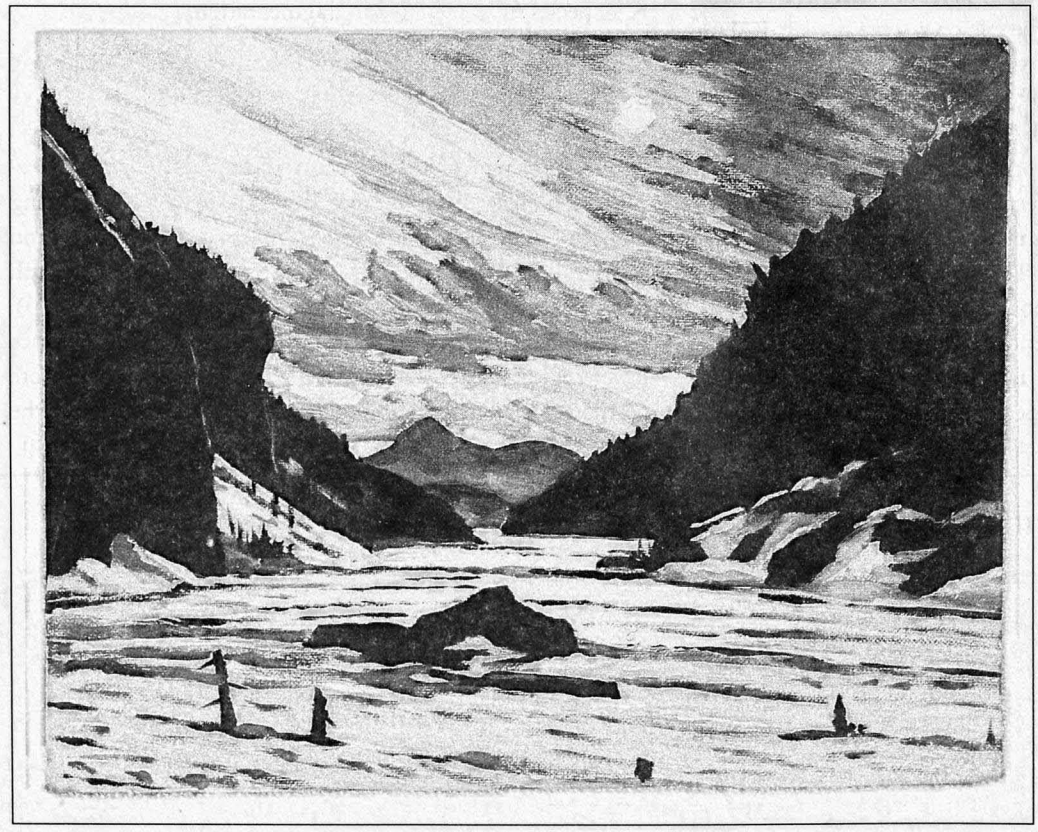
Opportunities for Wildlife Habitat Connectivity between Algonquin Provincial Park and the Adirondack Park



by Peter Quinby, Steve Trombulak, Thomas Lee, Robert Long, Paula MacKay, Jeff Lane, and Michael Henry

EXECUTIVE SUMMARY

The Frontenac Link, an area characterized by its distinctive band of Precambrian bedrock, offers a unique opportunity for restoring a binational, ecological linkage between two of northeastern North America's oldest and largest parks: Algonquin Provincial Park in Ontario and the Adirondack Park in New York. This study is the product of two analyses that, collectively, identify the best path for a priority conservation zone between the two parks (a distance of approximately 270 kilometers), with the overriding goal of reestablishing natural connectivity of wildlife habitats. Using the eastern timber wolf (*Canis lupus lycaon)* as a focal species, the first analysis identified and characterized a corridor between the Adirondack Park and the Thousand Islands region (Trombulak and Lane 1996); the second, between the latter and Algonquin Provincial Park (Quinby et al. 1998). The area of the proposed Priority Conservation Corridor is approximately 8,600 square kilometers, with its width varying according to the quality of selected habitat at any given point. Protected and restored, this corridor would not only provide connectivity between these parks for wolves and other large, wide-ranging species, but would also provide secure habitat for the myriad other species inhabiting this region.

Adirondack landscape by Bill Amadon

No Park Is an Island

That existing parks and Wilderness Areas alone are too small and isolated to protect biodiversity is dramatically illustrated by current trends in species loss. Even our largest parks may not sustain viable populations of large carnivores (Newmark 1985, Soulé 1987, Grumbine 1990) and are part of an ecological mosaic that incorporates the land surrounding and between them (Merriam 1995). When connections between suitable habitat are severed, the resulting fragmentation may have dire consequences for small, isolated animal populations subjected to genetic and demographic effects (Brown and Kodric-Brown 1997). Furthermore, fragmentation invites a host of other problems for wildlife, including increased human disturbance of species and habitats (Noss et al. 1997). For example, a recent study found that conflict with people on reserve borders is the major cause of mortality for large carnivores inhabiting parks and protected areas (Woodroffe and Ginsberg 1998). At Algonquin Park, Théberge et al. (1996) found that 50% of resident wolf packs have territories extending beyond park boundaries. Anthropogenic effects are a significant threat to these wolves, with 75% of human-induced deaths occurring outside of the park (Forbes and Théberge 1995).

The restoration of functional connectivity between protected areas is essential to prevent or mitigate deleterious population effects associated with fragmentation, and to ensure the viability of wide-ranging species that require ample habitat for foraging, seasonal movement, and other needs (Noss 1983, Harris 1984, Noss and Harris 1986, Soulé 1987). Noss et al. (1997) suggest four specific guidelines arising from the connectivity principle:

- All else being equal, wide swaths of suitable habitat are better than narrow corridors.
- Corridors longer than normal dispersal distances for a target species should be sufficiently wide or have enough "stepping stone" habitat patches to provide for resident individual home ranges.
- Animals usually follow a path of least resistance when moving through a landscape.
- Planners should base connectivity designs on the needs of species most sensitive to fragmentation.

These guidelines are fundamental to the methodology used in the current study.

The Frontenac Link

The Frontenac Link is a broad swath of land connecting Ontario's Algonquin Park to the Adirondacks (Fig. 1), and includes the Frontenac Axis, the least degraded north-south corridor across the St. Lawrence River (Keddy 1995). Approximately 12,000 years ago, the present St. Lawrence River region was covered by a glacial lake, while the more northern portion was tundra (Anderson 1989). Today, the

Fig. 1. Greater Laurentian region showing the Frontenac Link

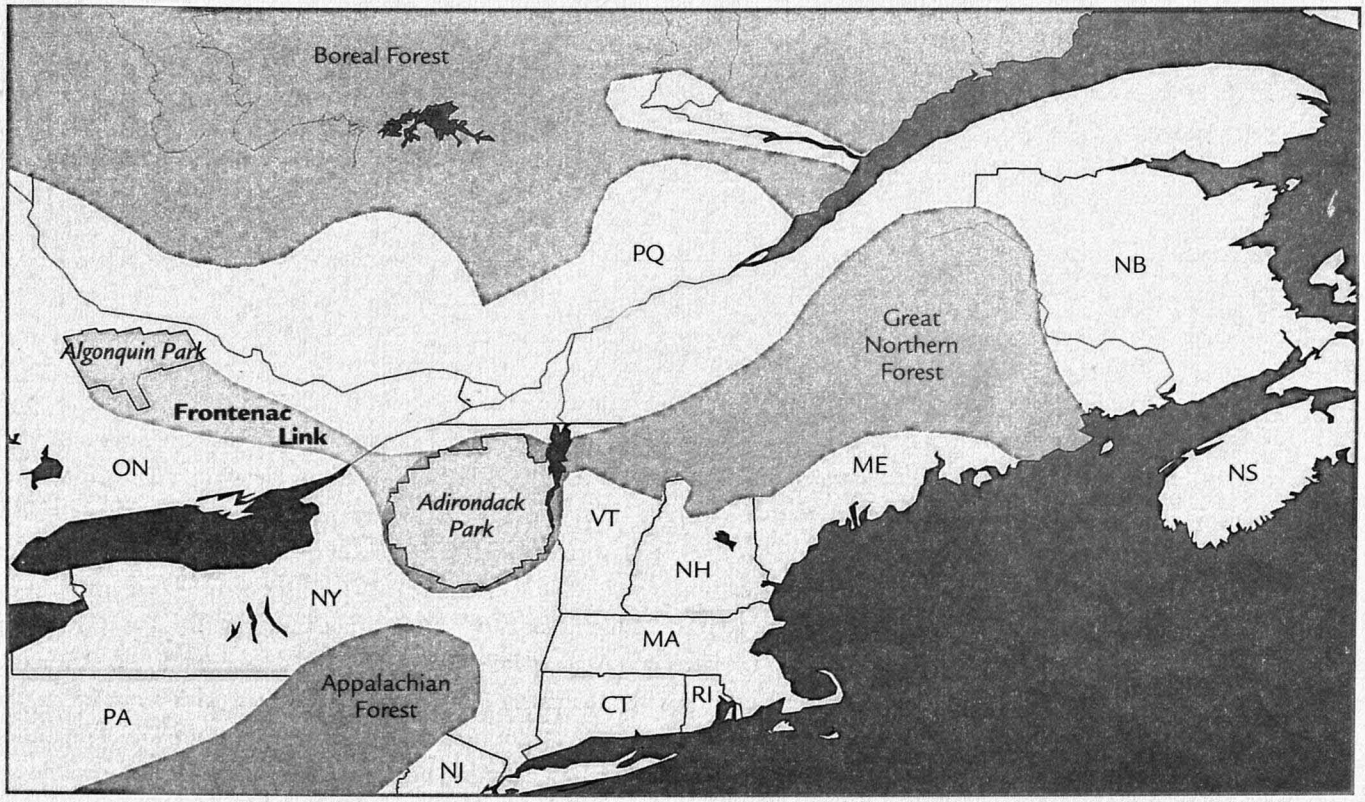
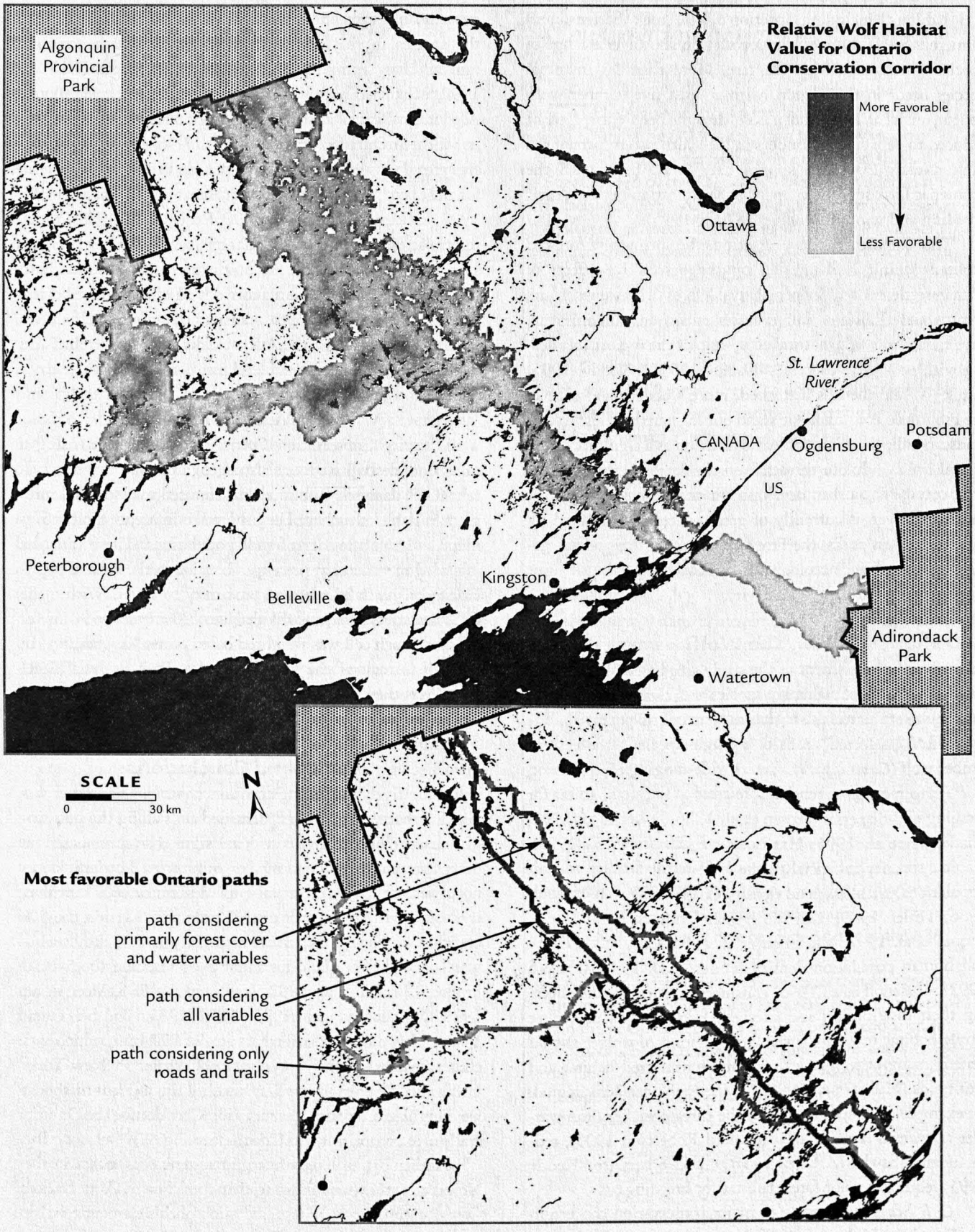


Fig. 2. Priority conservation corridors

based on the top 5% of wolf habitat along most favorable corridor paths



Frontenac Link lies near the continent's northeastern limit of deciduous forest, thus providing a critical biogeographical connection between Canada's boreal forest and the northern forest of the US. The wide array of environmental conditions and habitats, including interior forest, rock barrens, and numerous wetland types, supports a rich and diverse range of species—many of which are rare. More than 50 mammal species occur in this region, with at least five (timber wolf, cougar, marten, lynx, and moose) having been extirpated or reduced to very small numbers in the southeastern part of the Link. Nearly 200 bird species may breed here, with the Frontenac Link serving for many as a connection between their breeding and wintering ranges (Keddy 1995).

The importance of protecting the primarily forested Frontenac Link is magnified by the destructive effects of human settlement on its periphery. Deforestation, agriculture, commercial fishing, mining, water mills, and urbanization have transformed the natural ecosystem of the region, interfering with ecological processes (Osborne 1995). Keddy (1995) states: "While the less disturbed, more wooded landscape of the Frontenac Axis makes it stand out in sharp contrast to this landscape, the deterioration of its function as a significant ecological linkage due to threats from the major highway corridors, cottage and urban development and pollution of the St. Lawrence River, is currently of great concern." Anchored by two world-class parks, the Frontenac Link presents a strategically situated and ecologically valuable opportunity for reestablishing wildlife connectivity.

Why the Wolf?

To perform an assessment of the study area based on the habitat requirements of all native species was clearly impractical. Rather, we evaluated the region in terms of its potential ability to fulfill selected needs of a single species—the eastern timber wolf (*Canis lupus lycaon*). A wide-ranging top predator, *C. l. lycaon* requires extensive core areas of forested habitat for foraging and dispersal (Jensen et al. 1986, Fuller et al. 1992, Mladenoff et al. 1995, Harrison and Chapin 1997, 1998). Habitat security is crucial to the long-term viability of wolf populations, with low road density (Thiel 1985, Jensen et al. 1986, Fuller 1989, USFWS 1992, Thurber et al. 1994, Paquet et al. 1997, Mladenoff et al. 1995, Corsi et al. 1999) and human population density (Fuller et al. 1992, USFWS 1992, Mladenoff et al. 1995) considered critical factors affecting their distribution and survival. Furthermore, providing ample habitat to assure a viable population of wolves should benefit many other species with more restricted habitat and area needs (Miller et al. 1998). In the Frontenac Link region, for example, bird species such as the threatened cerulean warbler *(Dendroica cerulea)* (Oliarnyk and Robertson 1995), red-shouldered hawks *(Asturina lineata),* and others (see Keddy 1995) require interior forest habitat for breeding.

C. l. lycaon is currently of major conservation concern in the Frontenac Link region. Wolves were historically present throughout the study area, but were extirpated from the southern portion by 1900 (Harrison and Chapin 1997). Wolf recovery in the northeastern US has been the focus of increasing interest, especially since the US Fish & Wildlife Service recently announced its intention to design a recovery plan for the species in this region. Although potential habitat for recovery has been identified in the Adirondacks (USFWS 1992, Mladenoff and Sickley 1998, Paquet et al. 1999) and Algonquin Park is the most significant stronghold for wolves in southern Ontario (Théberge et al. 1996), there are expansive areas between the two parks that do not meet the criteria for either core or dispersal habitat (Harrison and Chapin 1997, 1998, Mladenoff and Sickley 1998, Paquet et al. 1999). Thus, recent attempts to model connectivity for wolves between southeastern Canada and the northeastern US have failed to identify a contiguous biotic corridor in the Frontenac Link region. Our study attempts to answer the question: If wolves were to move between the Adirondacks and Algonquin Park, what would be their path of least resistance?

Methods

The Priority Conservation Corridor was identified using a number of descriptive models and geographic information system (GIS) analyses. The models were used to assess and integrate variables that have been shown to influence wolf movement and the integrity of wolf populations. These variables included road density, presence of major roads, human population density, land use, and proximity to water. Within the GIS, the study area was divided into 90 meter by 90 meter cells, and each cell was weighted based on its "favorability" in relation to each of the above variables. Path analysis (ESRI 1996) was then used to identify the most favorable paths (cell by cell) between the parks (Fig. 2).

Results and Conclusions

By qualitatively evaluating corridors of various widths, it was decided that the top 5% of identified cells along the best single path provided better corridor designs than those based on other percentages. This model minimizes bottlenecks in northwestern New York and provides continuous corridors throughout the remainder of the study area. Within the 5% corridor for New York, the road density is 0.31 km/km^2—well below the threshold for suitable wolf habitat (0.45–0.70 km/km^2) (Fuller et al. 1992, Jensen et al. 1986, Mech et al. 1988, Mladenoff et al. 1995, Thiel 1985, Thurber et al. 1994). This model described an area of 977 km^2, which was chosen as the Priority Conservation Corridor in New York. Using the 5% level and similar but slightly different methods, we identified a Priority Conservation Corridor for the Ontario study area comprising 7,622 km^2. (See Fig. 2.)

Additional analyses of natural aquatic ecosystems in the New York study area indicate that the Priority Conservation Corridor provides good representation of this element relative to the entire study region. This suggests that the wolf may be

an effective umbrella species for aquatic ecosystems. The corridor does not, however, adequately represent some of the less common plant community types (e.g., oak-hickory, white-red-jack pine) found in the region. Further analyses using other techniques would be necessary to address the protection of these community types.

Habitat suitability is a measure of habitat productivity (food resources) and habitat security (safety). It is important to note that the current study is not a rigorous habitat suitability analysis, but primarily addresses habitat security. Other research suggests that the main factor limiting wolves *where they are tolerated by humans* is prey density (Fuller et al. 1992). In our study, prey availability was considered only insofar as it is related to forest cover and distance to water bodies. Further examination of prey density is necessary to analyze habitat suitability for wolves in the Frontenac Link.

Based on current conditions, the likelihood of individual wolves dispersing from extant populations in Ontario into the northeastern US is uncertain because of potentially significant physical barriers (e.g., the St. Lawrence River) and isolation of suitable habitat (Harrison and Chapin 1998, Wydeven et al. 1998). Furthermore, a recent study examining the feasibility of wolf reintroduction in the Adirondack Park found that, although prey density and habitat within the park are likely sufficient to support a small population of wolves, linkages between the park and other subpopulations of wolves are inadequate to ensure the long-term persistence of the population (Paquet et al. 1999). This study concluded that "emphasis needs to be placed on identifying landscape connections with other nearby reserves."

While our analyses point to the best potential linkage between the Adirondacks and Algonquin Park, the challenges to establishing on-the-ground wildlife connectivity are formidable. Habitat fragmentation due to human development is severe in some areas, especially along the St. Lawrence River, and icebreaking activities on the river further hinder the potential for wildlife movement. Any efforts toward carnivore restoration must also overcome pervasive negative human attitudes within the recovery region. Nonetheless, this region presents a unique opportunity for restoring a vital linkage between the northeastern US and southern Ontario. Such a corridor would allow for movement and genetic exchange within populations of *many* species, including black bear, lynx, moose, and a variety of smaller mammals, birds, and invertebrates (Wydeven et al. 1998). Opportunities for such large-scale connectivity should not be overlooked.

The restoration of this linkage will require binational, visionary, and pragmatic conservation efforts involving both public and private lands. For example, the Algonquin to Adirondacks (A2A) Conservation Initiative seeks to involve private landowners in restoring and maintaining connectivity through private land stewardship (see sidebar). The protection of core areas will also be essential: A2A supporters recently helped secure over 259,000 acres of new protected areas in the

About the Algonquin to Adirondacks Conservation Initiative

The Algonquin to Adirondacks Conservation Initiative (A2A) presents a bold new vision of cooperative conservation on a grand scale. Spearheaded by the Canadian Parks and Wilderness Society (CPAWS), A2A is a binational effort to preserve ecological connectivity between Algonquin Provincial Park in Ontario and Adirondack Park in New York. At a regional scale, the landscape between the two parks affords a rare opportunity in eastern North America to maintain and protect habitat and movement potential for native plants and animals along a north-south axis.

Centered on the rugged terrain of the Frontenac Axis, the A2A vision is one of an ecologically sustainable home place that provides for the well being of both its wild and human inhabitants. A place where...

- natural areas, whether privately or publicly maintained, provide functional connectivity across the landscape.
- ecological linkages, anchored by the two great parks, extend across highlands, valleys, rivers, and political boundaries.
- the essential natural movement of organisms, water, and nutrients occurs seamlessly at local, regional, and international scales.
- the traditions, scenic beauty, and biological diversity of the region are maintained for their inherent value and for the life-support and enrichment of future generations.

As the majority of land between the two parks is owned privately, individual landowners have a key role to play in preserving the habitat that supports people, plants, and animals. Of course, public land also plays a vital role. Two years of advocacy work by CPAWS and others culminated in last year's designation of more than 259,000 acres of new protected areas in the A2A region of Ontario.

A2A is a vision shared by a society that recognizes the importance of natural areas and is resolved to maintain them. Our success will depend on the cooperative efforts of a broad diversity of organizations and individual landowners. The current focus of A2A in Ontario is to support private land stewardship. For more information, please contact

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region via Ontario's "Lands for Life" land-use planning process. Movement barriers resulting from roads will need to be creatively addressed using tools such as overpasses and underpasses, reduced speed limits, road closures where possible, and by reducing the number of new roads. A strategy must also be developed to restore the ice "bridge" historically afforded by the frozen St. Lawrence, but severed by today's ice-breakers. Most importantly, extensive public outreach will be necessary to foster more positive attitudes toward predators and biodiversity conservation as a whole.

Given the current pattern of human settlement and the dearth of truly large, protected wildlands, connectivity zones are integral to the maintenance of ecological integrity across the landscape. Our results identify a Priority Conservation Corridor that, if restored and protected, could provide functional connectivity for wolves and many other species, as well as a starting point for protecting selected special elements and natural communities. Future studies should be undertaken to fully examine potential values provided by the corridor, and to adapt it as appropriate. Meanwhile, these preliminary findings may help to guide managers, landowners, educators, municipalities, and land trusts in focusing land protection strategies where they are most likely to benefit biodiversity in the long term.

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A Thousand Suns

On an afternoon without a breeze
A bumblebee,
With a coin's weight,
Flies into a poppy.
The poppy nods approval:
Food for seed.

The particles of light
That are the poppy's pollen
Circle on bee-leg baskets,
One heavy flower to the next,
And finally to the dark hole
Of the hive.

In the hills
And on the coast of California
Poppies open,
Track the sun,
And fold at dusk.

This folding and unfolding
Of the golden flags of summer
Is a statement of survival
Translated into beauty—
A reminder that survival
Is as beautiful as these—
The thousand suns of summer.

—Matthew Orr

Drought

Leaves like curled hands, like hollow bones
breaking under my feet

Still the crickets
those dark sisters
sit
all day in the bitter grass

They ring and ring their tiny prayer bells

—Cheryl Hellner

Abundance

1.
Doesn't the sun show favor to my field—
potatoes large as melons, sultry kale,
the generosity of purple plums.
I dip my hands into the hive. At night the sky
out of its great confectionery basin
shakes a dust of stars. Grayling and bream
leap onto the bank to kiss my feet.

2.
I'm afraid of leaves and listening
to the gentle rain. I shudder
at its emotion, the oblivion
of the river that coils around my house.
The great triple-trunked oak struck
By lightning rots into mushrooms beneath
A thatch of cornflowers. The mice increase.
Woodpeckers are tearing the world apart.

—Rad Smith

Conservationists Retire Cows from Great Basin National Park

by Brad Meiklejohn

Imagine millions of square miles in Utah, Nevada, Idaho, and Oregon devoid of cattle. Picture clear streams, chock-full of native fish, meandering through lush meadows of native grasses, with nary a cow flop in sight. No buzzing flies, no stinking campsites, no chewed-up trails. Stop dreaming: we have the tools to make this vision a reality.

As of December 16, 1999, cattle grazing no longer occurs within Great Basin National Park. Under an agreement brokered by The Conservation Fund, three ranchers permanently relinquished their grazing permits to 101,000 acres for the price of less than $2.50 an acre. While admittedly the park is just a small piece of the broader Great Basin region, this effort is a great conceptual advance for conservation and an outstanding application of wildlands philanthropy.

Great Basin National Park lies astride the Snake Range of eastern Nevada, just across the Utah state line. The park is in the heart of the "basin and range" physiographic province described by John McPhee in a book of the same name. Seen from the air, repeating patterns of alkali deserts and high mountain ridges march hundreds of miles from the Sierra Nevada to the Wasatch Range. The mountain ranges form natural sky islands in a sea of dry basins, and as a consequence many of the islands support uncommon flora and fauna. With 13 peaks over 11,000 feet, the Snake Range contains remnant populations of species which survived on these mountaintops when Pleistocene glaciers filled the surrounding valleys.

bristlecone, Great Basin National Park by Valerie Cohen

Best known of the Great Basin's ancient residents are the bristlecone pines. These gnarled trees live at high elevation on rocky slopes in marginal conditions. At age 4,950 years, the most senior specimen, dubbed "Prometheus," is believed to be the oldest living tree in the world, and is in good company with numerous youngsters in excess of 4,000 years.

Originally established in 1922 as Lehman Caves National Monument, Great Basin was expanded and given park status in 1986 following a contentious 30-year effort. Unlike other national park units with sunset provisions for grazing permits, the 1986 law establishing Great Basin mandated that livestock grazing continue in perpetuity. The park enabling legislation made it impossible for the National Park Service itself to acquire the grazing permits. However, a rider to the 1996 Interior Appropriations bill allowed the Park Service to retire the grazing permits if they were donated to the United States.

Cattle grazing in Great Basin National Park was never popular. The ranchers liked to summer their cows in high alpine meadows and along mountain streams lined with aspens and willows. But these are the same places favored by park visitors, and complaints about cows in campgrounds and creek beds began to paper the desk of Senator Harry Reid (D-Nevada). In an attempt to eliminate grazing, Reid played matchmaker with ranchers and The Nature Conservancy in the mid-1990s, but that effort fell apart for lack of money.

Enter The Conservation Fund. By 1998 the Fund, a national nonprofit organization, had already purchased and retired 340,000 acres of grazing rights at the Sheldon National Wildlife Refuge in northern Nevada and 53,000 acres in southern Utah's Escalante canyon country. At the request of the National Park Service, The Conservation Fund negotiated with the three permit holders for permanent retirement of cattle grazing from 101,000 acres in Great Basin National Park and in surrounding national forest Wilderness Areas. Under their existing permits, ranchers could run nearly 5,000 cows and calves in Great Basin National Park during summer months. For the price negotiated with The Conservation Fund, the ranchers would relinquish their grazing privileges and these privileges would be permanently retired by the National Park Service. The ranchers, tired of fighting with the public, readily embraced the deal, which allowed them to retain their base properties (in this case, private ranches outside the park) to which grazing permits are typically tied. The deal covered 2,432 AUMs (Animal Unit Months: forage for one cow and calf for one month) for the appraised value of $100 per AUM, for a total of $240,000. Basically, buying an AUM from a permittee buys out a cow/calf pair on public lands for one month each year, forever.

The Conservation Fund had hoped to move quickly with funding from a reliable philanthropic source, but was forced to scramble when that funder withdrew. Reluctant to see this great opportunity wither for lack of a rather small amount of money, we began tapping into the loose-knit "wildlands philanthropy" community. With support cobbled together from the Sperling Foundation, the Weeden Foundation, the Foundation for Deep Ecology, the National Fish and Wildlife Foundation, the National Park Foundation, the Richard and Rhoda Goldman Fund, the Turner Foundation, and some anonymous donors, the deal closed December 16, 1999.

Along the way we met critics who took issue with our approach to grazing retirement. Some argued that our deals validated grazing as a right rather than a privilege. Some contended that because grazing is a privilege, not a right, there is no property interest which can be bought and sold. Others felt it wrong to pay ranchers a "ransom" when cows should not be on public lands in the first place. All fair points, but at the end of the day, the cows were still wallowing in the creeks and pooping in the campgrounds of Great Basin National Park. We chose to pursue a pragmatic, effective strategy that was fair to grazing permittees, cost taxpayers nothing, and could immediately eliminate an ecological threat to the park.

For less than a quarter of a million dollars, cows will never again graze in Great Basin National Park. There are few tools which have the certainty, immediacy, and cost-effectiveness of a grazing buy-out. This victory, while funded privately, is another example of why conservationists should work hard for a federal buy-back program. With approximately 21 million AUMs on 254 million acres of public lands across the West, the total cost to remove grazing from public land through buy-outs is estimated at $1.6 billion, or about $6 per acre. With an annual appropriation of $50 million from the Land and Water Conservation Fund we could see public lands grazing eliminated in our lifetimes.

However, a federally funded grazing buy-out program may prove as elusive as grazing reform. In our work at Great Basin National Park and elsewhere in the West, we have shown that the fastest way to remove cows from public lands is with private funds. At very low cost, it is a perfect application of wildlands philanthropy with great ecological benefits for the land, recreational benefits for the public, and economic benefits for ranchers beset by global market forces and low beef prices. We, along with our financial backers, feel that the peace of mind is well worth the investment. ☾

Brad Meiklejohn *is the Alaska Representative for The Conservation Fund. During his tenure, the Fund has protected 300,000 forever wild acres in America's largest and wildest state.*

bobcat in birch by James Opalenik

Protected and Connected

Weaving the Wildlands Web in Southwest New Hampshire

by Bob King and Annie Faulkner

One especially frigid night last winter, between bouts of global warming, we ventured out into the still, blue darkness. We walked awkwardly, bundled as we were, to the high point of our land, a place we fondly call "Rainforest Lookout." Looking out from this granite outcrop over the canopy of the dormant forest, we saw not one light of house or settlement. The dearth of foliage allowed us views in all directions—to Chandler Meadow low in the east, Mt. Monadnock to the south, Hodgeman Hill in the north, and Joslin Hill to the west. Nowhere did the sights or sounds of humans disturb the winter night. And though we did not need to speak it, we shared a warm satisfaction bordering on hope, knowing that much of this landscape has been permanently conserved.[1]

History

Long before lands needed "conserving," the Monadnock bioregion contained forests of giant chestnut, oak, and hickory (often fire-managed by indigenous peoples) and white pine stands where trees over six feet in diameter were the norm. European settlers wasted no time in converting much of the forest land to pasture, bordered by miles of stone walls. Sheep dominated the landscape until the middle of the 19th century when the more fertile Midwest caught favor. With the exodus of sheep farming, the forest began to recover. Now, after a century of reforestation, forest cover in New Hampshire is again in retreat, this time as a result of commercial and residential development.

The story of how our corner of this bioregion gained conserved status began in 1937 when Jim and Mary Faulkner began acquiring the many contiguous parcels that now make up the 11,500-acre Andorra Forest, located mostly in Stoddard, New Hampshire. Protecting land from development was not their primary motivation. Jim—having grown up in nearby Keene—wanted a place where his children could enjoy the woods. Their initial purchase of 5,000 acres was more than enough for a family playground, however, and so they set out to practice "good forestry" as well. (Good forestry quickly met natural disturbance when the hurricane of 1938 and the great Marlow fire of 1941 leveled much of the forest.)

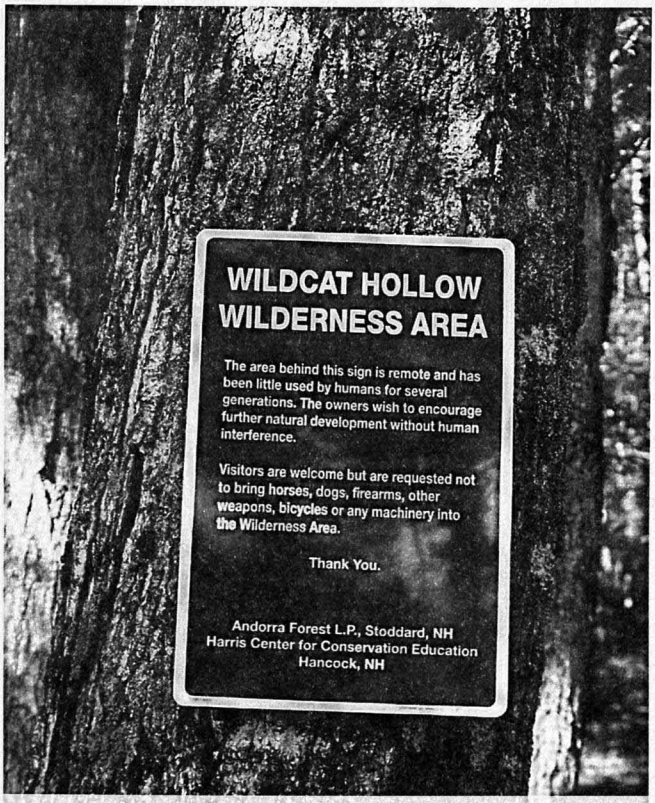
The Easement Process

As the family added parcels to Andorra Forest in the 1940s and 1950s, development concerns were still several decades off. If land needed protection at all, it was from poor forestry or farming practices. Wilderness and ecological restoration were not considerations. But as the second century of industrialism wore on, large blocks of undeveloped land this close to the major population centers of the Northeast became more scarce. When the next generation of Faulkners inherited the land in the 1980s, they began considering long-term conservation options for Andorra Forest. Their goals were to keep the land intact and undivided, to keep it in family ownership for as long as possible, and to ensure a healthy forest ecosystem into the future.

Intending to put a conservation easement on Andorra Forest, the Faulkners contacted The Nature Conservancy (TNC), the Land Conservation Investment Program, and other groups. At the time, TNC was focused solely on protecting lands containing rare or endangered species or ecosystems, and Andorra (at least at first glance) did not meet the test. It is also

1. Throughout this article, we apply the term "conserved" to lands which are under conservation easements or are owned in fee by a conservation organization. This includes managed timberlands as well as "forever wild" lands.

possible TNC steered clear of Andorra because of the family's desire to continue practicing forestry on well over half the land, while TNC then worked only with wild lands (TNC, Audubon, and others now engage in forestry easements as well as unmanaged, forever wild easements). The family turned to the Society for the Protection of New Hampshire Forests (also known as the Forest Society) and in 1990 finalized a conservation easement with them. The Andorra Forest easement, like most Forest Society easements in New Hampshire, allows forestry to continue on the majority of the property, while strictly limiting subdivision and residential, industrial, and commercial activity. Though not required by the Forest Society, the family also included in the easement as one measure of sustainability a limit on the amount of wood that could be harvested in any given year.[2]



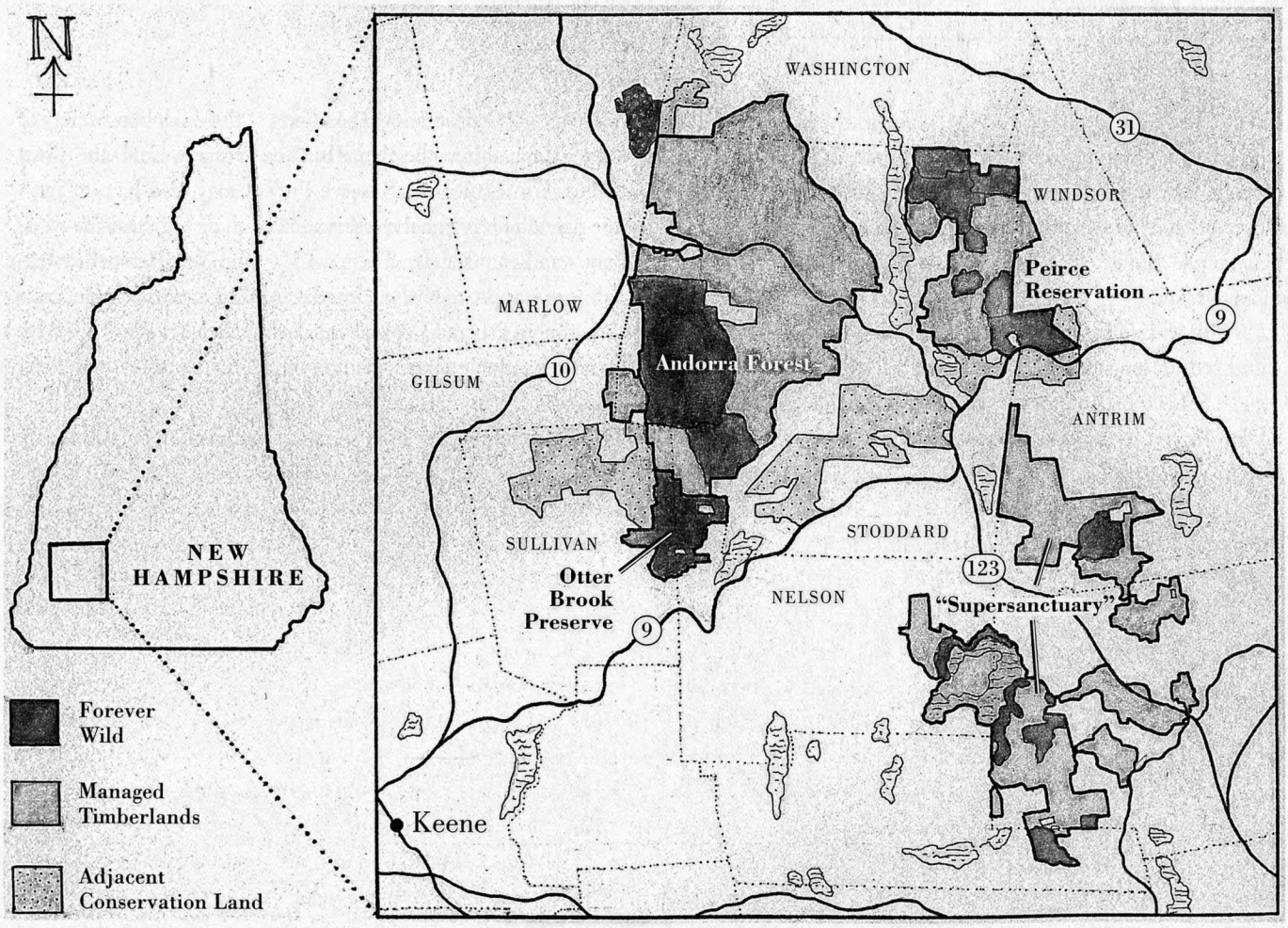
A distinctive aspect of the Andorra Forest easement is the designation of a 2,600-acre wilderness area known as Wildcat Hollow. This area was set aside as forever wild, to be left undisturbed and allowed to return to a natural state. While the family believes that responsible forestry has an important place in the regional economy, they also understand and support the ecological and spiritual values associated with entirely unmanaged wild land. Accordingly, the easement prohibits logging, farming, and most other human uses in Wildcat Hollow. Except for a few footpaths maintained with bow saws and axes, the area is being left to return to wilderness. In a state that prides itself on its managed timberlands—often described hereabouts as "working forests"—Wildcat Hollow Wilderness Area remains an anomaly.

The Forest Society, which now holds easements on some 65,000 acres, was unfamiliar with the idea of a large, privately owned, no-cut area resplendent with big trees. Consequently, another regional land trust, the Harris Center for Conservation Education, was invited to advise the family on appropriate boundaries and to assist in monitoring Wildcat Hollow Wilderness Area.

Another aspect of the Andorra Forest easement is that it was donated rather than sold. Thankfully this is the norm for non-industrial landowners. Although tax benefits accrued to the family, as they do with any charitable contribution, this was not a primary motivation for donating the easement. Contrast this with recent large-scale easements on industrial forest land in northern New England, which are often sold rather than donated. All too often, these easements fetch top dollar for the industrial landowners while sapping the limited coffers of the conservation community. Although development is precluded, logging often continues on an industrial level with its concomitant clearcuts, herbicides, and short rotations. The challenge in these cases is to leverage the industrial owner to donate the easement, sell it below market, commit to low-impact forestry, or set aside (via easement or deed restriction) substantial wilderness areas.

Andorra is regularly cited as the core of a growing and interconnected mosaic of conserved lands. All told, these lands represent over 33,000 protected acres of which approximately 11,000 acres are forever wild.

2. As part of Andorra's ongoing management, the family is now considering new models for sustainable forestry, including green certification and "ecoforestry."



Andorra Highlands

Andorra Forest is only a part of a larger conservation story unfolding in southwest New Hampshire. Indeed, one of the greatest benefits of Andorra's conservation may be the inspiration it has given other efforts in the region. While much of the recent land protection in this area would have happened regardless, Andorra is regularly cited as the core of a growing and interconnected mosaic of conserved lands. To its east lies the Peirce Reservation, a 5,513-acre complex of managed and wild lands owned by the Forest Society and Sweet Water Trust. This area was recently connected to Andorra via several smaller conserved parcels totaling another 2,117 acres. Abutting Peirce to the southeast is a newly protected area surrounding the Lovern's Mill Atlantic white-cedar swamp. Key players for this 1,238-acre area include The Nature Conservancy, the Forest Society, Sweet Water Trust and, perhaps surprisingly, the New Hampshire Department of Transportation. To the southeast of this lies the 9,500-acre patchwork of interconnected protected lands catalyzed by the Harris Center and known affectionately as the "Supersanctuary." Immediately south of Andorra (and including our own land) is the 1,663-acre Otter Brook Preserve, a recent project of TNC, Sweet Water Trust, and ourselves. Abutting both Otter Brook and Andorra to the west are 1,674 acres owned by or under easement with the Forest Society. All told, these lands represent over 33,000 protected acres of which approximately 11,000 acres are forever wild. With the addition of three more parcels, these protected lands will be contiguous, and easements are pending on two of the three. Of the managed lands, none is absentee-owned industrial forest and most are logged selectively on rotations favoring an increase in biomass over short-term profits.

Recovering Wildlands

Some of the players in our bioregion's conservation efforts are inspired by the lessons of conservation biology and the vision of The Wildlands Project. Certainly in terms of cores, corridors, and carnivores, we have all of these, at least on a small scale. Parts of Andorra Forest, the Supersanctuary, and TNC lands are unmanaged and unfragmented core areas, far from roads and the buzz of chainsaws. Parts of the Peirce Reservation receive scant human visitation and enjoy an extremely high level of protection, thanks to the wilderness values and scientific clarity of

map by Libby Davidson

Sweet Water Trust. The Forest Society, which historically steered clear of formal forever wild designations, is preparing to place a forever wild easement on at least 70% of the Peirce Reservation. And the region's extensive managed holdings provide ample buffering and connectivity giving wild creatures room to roam.

With its reforestation over the past century, this region has witnessed an amazing recovery of wildlife. Red and grey fox, coyote, bobcat, fisher, and various other mustelids call this area home. Turkey, bear, and moose populations are returning to healthy numbers. There have even been unconfirmed reports of mountain lions passing through. Despite the New Hampshire legislature's efforts to outlaw wolf reintroduction, some of us remain committed to the recovery of wolves and other top predators throughout their native ranges. It has been 197 years since a posse of Stoddard men drove some of the area's last wolves to the top of Hodgeman Hill, where they proceeded to shoot the canines full of lead. When yipping coyotes wrest us from sleep, it is hard not to wonder about (and welcome) the wolf's return to New England.

Despite the successes in southwest New Hampshire to protect land from development and to link conserved lands, the work is only beginning. New Hampshire is the fastest growing state in New England, absorbing 15,000 new people each year and losing at least 20,000 acres to development annually. These trends pose a challenge to our vision of New England, one where our villages and cities appear as islands in a sea of conserved lands, rather than the other way around. Fortunately, numerous individuals and groups are working to forge the links between the existing Andorra Highlands region and other large protected areas, including Sunapee, Pillsbury, Pisgah, and Monadnock State Parks. Simultaneously, we hope to extend the web of protected and conserved lands to the Quabbin Reservation in Massachusetts, the Green Mountain National Forest in Vermont, and eventually the White Mountain National Forest in northern New Hampshire.

Whether and how we make these links depends on the vision and commitment of private landowners, citizens, and nonprofit organizations who have been instrumental in creating the existing network of conserved land in southwest New Hampshire. With the basic tenets of conservation biology permeating the conservation community, expansion of the wildlands web may now happen as much by design as by opportunity. Private organizations such as The Nature Conservancy and the Forest Society have recently adopted a "landscape scale" approach to conservation. Another active proponent of landscape-scale linkages is the relatively small and local Monadnock Conservancy. The efforts of the Audubon Society of New Hampshire, the US Humane Society, and the New Hampshire Ecological Reserve Project may also help to push the agenda for regional conservation, with an emphasis on wildlands and connectivity. This past May, the New Hampshire legislature approved the Land and Community Heritage Investment Program, making public funds, matched with private money, available for acquisition of priority conservation lands. This was a coup in frugal New Hampshire.

An emerging question for conservation efforts in this region is whether we have enough wilderness within the mix of protected lands. For some of us, the answer is clearly no—a view reinforced each time we stumble onto skidder ruts in a stand that had been returning to old growth. In our region we sense a cultural ignorance regarding the concept of forever wild forests and a tendency to embrace the "working forest" as the standard conservation tool. Forestry easements that preclude development and fragmentation of managed forests are useful to complement, but not supplant, wilderness protection. Low-impact, ecologically based forestry should have a significant role in New Hampshire's economy and conservation planning, but more truly wild land is needed. Most northeasterners today know little of local old-growth forests, of the awe and humility such places inspire, in part because there are no old forests in this region to experience, save for a few small patches. As a culture, we have ecological amnesia; we simply have not been around enough giant trees in a diverse, ancient forest to know what is missing—and to recognize the ecological, social, and spiritual values that wild forests provide.

It is possible that some lands now protected under a forestry easement will be further protected under a forever wild easement at a later date. Those lands currently protected as forever wild can begin their belated march toward old age. Perhaps on the eve of the next century, or the one after that, future generations exploring Andorra Forest's Wildcat Hollow will experience a towering ancient forest. For our lifetimes, we are comforted by the knowledge that another piece of Nature is being left to run its course without human interference. And we work each day with the hope that the wildlands web will beat population growth in the race across New England. ☾

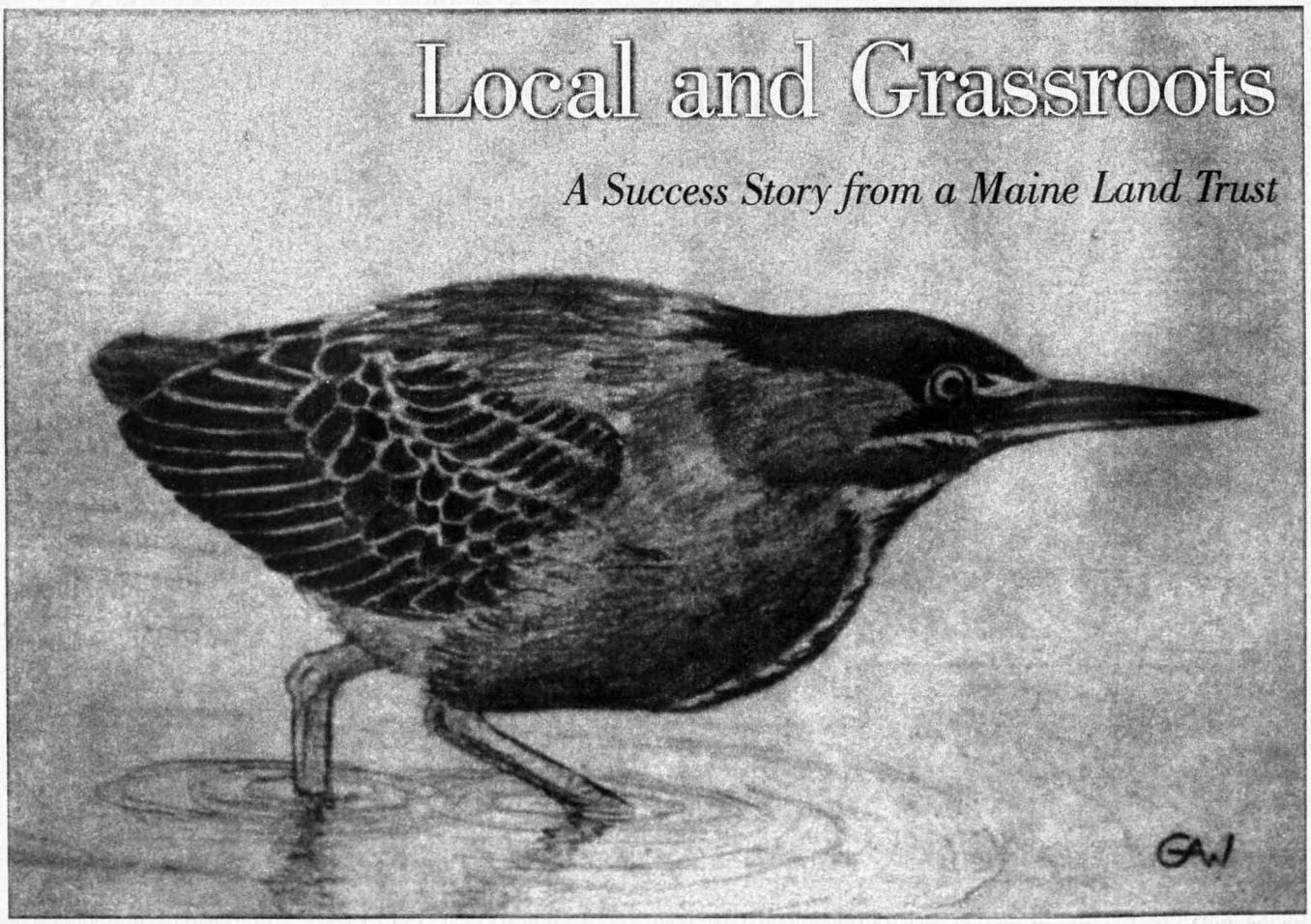
Bob King, *who serves on the board of RESTORE: The North Woods, and* **Annie Faulkner,** *who coordinates the New England Coalition for Sustainable Population, promote land conservation and population stabilization from their homestead at the old Perley Swett place in southwest Stoddard (PO Box 174, Sullivan, NH 03445; d9cat@cheshire.net).*

In countless localities, like green shoots pushing up through the rubble, new social and economic arrangements are sprouting. They may be hard to see at first, because they are seldom featured in the media, but if you keep your eyes open and fiddle with the focal length, they come into view—like a faint green haze over things, intensifying here and there in pockets of grass, cress, clover. Not waiting for our national or state politicos to catch up with us, we are banding together, taking action in our own communities. The actions that burgeon from our hands and minds may look marginal, but they hold the seeds for the future.

—Joanna Macy[1]

Local and Grassroots

A Success Story from a Maine Land Trust



by Kirstin George

Five hundred years ago the Sheepscot River watershed was teeming with life. A wild, diverse forest ranging from boreal coniferous to mixed soft- and hardwoods covered the entire 320-square-mile basin. Towering white pines with diameters up to eight feet dominated the edges of waterways. In this shaded clear water, Atlantic salmon swam the 58 miles from ocean to headwaters to spawn in shallow cobble-lined pools. Black bear, fisher, and the Abenaki people were among the many fish-eating inhabitants of the area. Mountain lions, wolves, deer, and moose maintained a mutually beneficial predator-prey relationship, while industrious beaver created wetlands for waterfowl, amphibians, and marsh plants. Each spring, islands at the river's mouth were covered with great auks and other coastal nesting birds.

green heron by Gabriel Willow

Europeans began to explore the Sheepscot River in the mid-1500s, and a century later some of the earliest English settlements in the New World were established along its banks.[2] Thus began a landslide of human activities that would dramatically and permanently change the web of life in the watershed: plagues ravaged the Native population, the largest conifers were floated downstream for shipment to Europe, the land was cleared for farms, dozens of dams were built to power sawmills and gristmills, and most of the large predators were eradicated by hunting and habitat loss. The populations of wolves and mountain lions were completely decimated and the last black bear living in the lower Sheepscot watershed was shot in the 1940s.[3] (Occasional bears are seen today in the headwaters region.) When the New England wool industry reached its peak in the 1830s and 1840s, an estimated 80% of the watershed was cleared of trees and cultivated or heavily grazed by sheep.

The tide of human population turned in the 1840s. With marketable natural resources diminished and new transportation routes opened, the people of the Sheepscot joined America's westward migration. Houses, fields, roads, and mills were abandoned and by 1900, most of the cleared land had begun to revert back to forests. The beaver, exterminated by over-trapping a century earlier, returned to the region, while deer, bobcats, otter, and hundreds of other forest dwellers expanded into their reclaimed habitats.[4] In most rural towns in the watershed, the human population continued to decline until the 1960s, when an influx of "back-to-the-landers" moved to the region. Montville, the town at the top of the watershed, had a typical population pattern: peaking at 2100 residents in 1845, dropping to 300 by 1960, and nearing 900 today.[5] By the 1970s and 80s, an increasing number of people, both newcomers and long-term residents, began to recognize the need to preserve and restore the watershed's ecological integrity.[6] But it is not easy to protect land that is privately owned by thousands of individuals and businesses—especially when the economic system encourages timber harvest, resource extraction, and development. Given this daunting social and historical context, the successful conservation work of one grassroots organization is impressive.

The Birth of a Land Trust

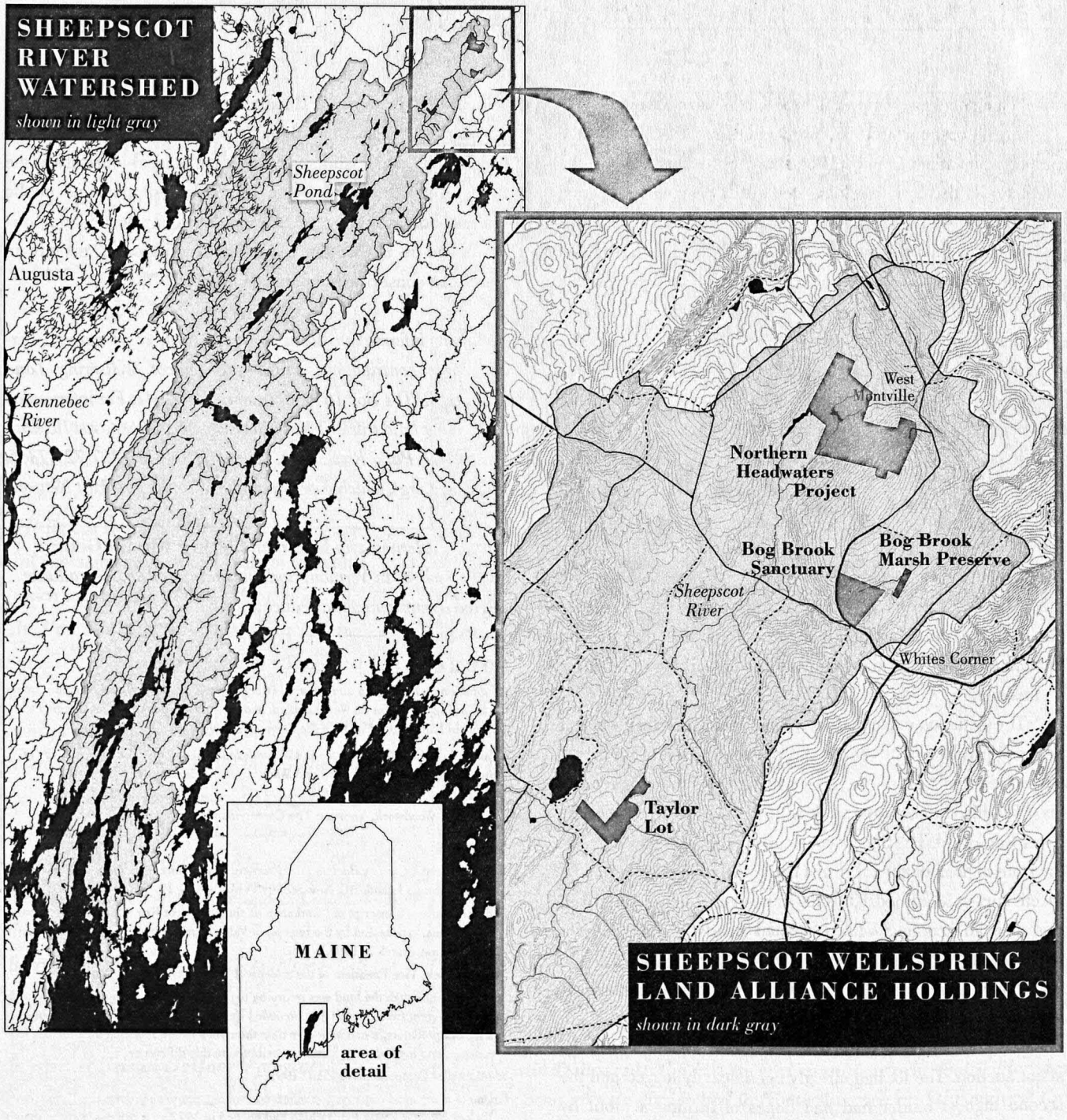
I grew up beside a cascading stream a mile above the Sheepscot River. A forest of birches, maples, ash, and white pines surrounded our hand-built house, and I could follow mossy stone walls in any direction to find hidden apple trees and cellar holes. My parents were among the disillusioned urbanites who had arrived in Montville in the early 1970s looking for a peaceful place to raise their children and "live off the land." They purchased 60 forested acres for $10,000 and with their neighbors began to learn the secrets of splitting wood, boiling sap, and growing vegetables. Through the years, some of the faces changed and most of the homesteaders shifted their lifestyles to accommodate professional jobs, but a reverence for Nature remained the common thread binding our "neighborhood." Almost everyone had experienced life in a paved and polluted environment and had deliberately chosen to make this place their home.

A shock wave reverberated through our community in the late 1980s when a forest in the heart of our neighborhood was reduced to a hillside of stumps. The land encircled a "deep freshwater marsh"—a classification which the Department of Inland Fisheries and Wildlife gives to only 3% of Maine's wetlands—that provided rich habitat for beaver, moose, great blue herons, and over a hundred other bird species. When we learned that the non-local lumberman had intentions of creating a four-lot subdivision called "East Whitten Hill Heights," we mobilized into action. Several residents circulated a petition opposing the subdivision and submitted it, bearing the signatures of 42% of the town's voters, to the town planning board. Meanwhile, the Department of Environmental Protection was investigating the logging site for possible violations of wetlands protection laws—an estimated 60 cubic yards of gravel had been dumped into the marsh to create a skidder access road. Discouraged by this opposition, the developer divided the 47-acre parcel into just two lots and put them on the market without houses in January 1991. The threat of development was diminished but not gone.

I was an idealistic eighteen-year-old by that time, eager to do everything I could to "save the earth." As a student on the Audubon Expedition Institute I had recently visited a thriving Maine land trust and decided to organize an informational meeting about starting one in Montville. Sixteen enthusiastic neighbors attended. Soon after, I left home for college, not knowing what would become of this seed. Within a year, the Sheepscot Wellspring Land Alliance (SWLA) was incorporated as a 501(c)(3) nonprofit organization and an active board of directors was raising money to buy the entire property and create a wildlife sanctuary.

Effective Preservation Efforts

Victory came in February 1993—the Bog Brook Marsh was purchased with a $10,000 loan and an additional $20,000 in donations. The original goal had been reached, but during the years of dialogue, this group of teachers, nurses, artists, and woodcutters had become committed to a larger purpose for the organiza-



tion. Their vision included conservation easements on properties around the sanctuary, environmental education programs, biological surveys, and a trail system open to the public for hiking and cross-country skiing.

In the years that followed, all of those dreams began to be realized. Moonlit owl walks, public slide shows on environmental issues, trail building days, and land surveys with foresters and biologists were a few of the Land Alliance's activities. One member donated an additional 11.5 acres near the sanctuary, and an art sale featuring 87 donated works of art boosted the ongoing fundraising campaign. Having a "commons" in the center of our neighborhood began to enrich our relationship to the land and to each other. In the land trust's newsletter, members would share thrilling wildlife encounters and philosophical musings. "A chorus of peepers and bullfrogs create a riotous din as swallows and redwings cross the marsh in a final feeding frenzy before nightfall....The mother black duck still has seven babies, which is good news since the population is in serious decline....Lynne reports a mother and baby moose and a family of foxes with four kits. Buck watched a muskrat feeding in the marsh for over ten minutes, Frank watched a snapper lay eggs in the gravel near the ash tree in front of the marsh, and Anne

watched a Blackburnian warbler feeding a baby cowbird."

In the autumn of 1997, word circulated that a 266-acre property, upstream from the Bog Brook Sanctuary, was on the market, and that a timber harvester with a poor environmental record had made an offer to buy it from the out-of-state landowners. With swift action, the SWLA board of directors forestalled the sale, raised $148,000 in emergency loans from seven private lenders, completed legal transactions, and took title to the land. In order to repay this substantial debt, the board developed a land use plan, and began applying for grants. The response was well beyond their dreams: nine foundations supported the Northern Headwaters Project with a total of $58,000 and private donors contributed almost as much. While the low-lying forest and wetland will remain "forever wild," there is discussion about establishing a small environmental education center at the existing house on the highland. Setting aside an area for sustainable forest management and a demonstration woodlot also has appeal. It is even conceivable that the land trust will graduate from an entirely volunteer work force meeting around kitchen tables, to a paid executive director working in an office on this site.

The Alliance expanded its vision again this year when it became involved with efforts to protect the entire river. A statewide project to restore salmon habitat was the primary catalyst for this collaborative work with the two land trusts in the lower watershed. The Sheepscot is among the last eight rivers in the state to host an annual run of native Atlantic salmon,[7] and a recent survey identified 109 sites in need of restoration.[8] Given this shift in scope, SWLA protected nearly a mile of river frontage at "McLaughlin's Crossing" three miles downstream from the Northern Headwaters property. When the 82-acre parcel went on the auction block for back taxes, SWLA's president raised $29,000 in two weeks and placed the highest bid in the silent auction. The lot had already been heavily logged and the second highest bidder had had hopes of turning a profit by extracting gravel.

The Sheepscot Wellspring Land Alliance now stewards 407 acres in the headwaters region and continues to offer educational events and hiking trails to the wider community. Motivation to carry on this work comes in part from awareness that we are not alone. There are 80 other land trusts in Maine, and most are local grassroots organizations created by citizens who love their homeland. In the last ten years, New England land trusts have more than doubled the number of acres they protect, now totaling 620,000.[9] Nationally, 1200 local land trusts protect an estimated 4.7 million acres.[10] At least one leader in the national conservation movement believes that these groups are making a critical contribution. M. Rupert Cutler writes, "After devoting 45 years to the goal of wildlands protection, I've come to the conclusion that all wildlands protection is local—that it's at the local level where we must build political support and public understanding to succeed....The burgeoning local land trust movement is as hopeful a trend as we've seen recently in American conservation efforts."[11] ☾

For more information about the land trust, or to make a tax-deductible contribution, write to Sheepscot Wellspring Land Alliance, RFD 1 Box 1640, Freedom, ME 04941. For information about other land trusts in Maine, contact the Maine Coast Heritage Trust (169 Park Row, Brunswick, ME 04011; 207-729-7366; www.mcht.org), which coordinates the Maine Land Trust Network.

Writer, wilderness trip leader, and activist **Kirstin George** *currently lives in Vermont and is working toward a graduate degree in environmental education.*

SOURCES

Information on the human and natural history of the Sheepscot watershed comes from the following two books on New England, and an interview about the local region with W. Donald Hudson Jr., Ph.D., of the Chewonki Foundation, March 2000.

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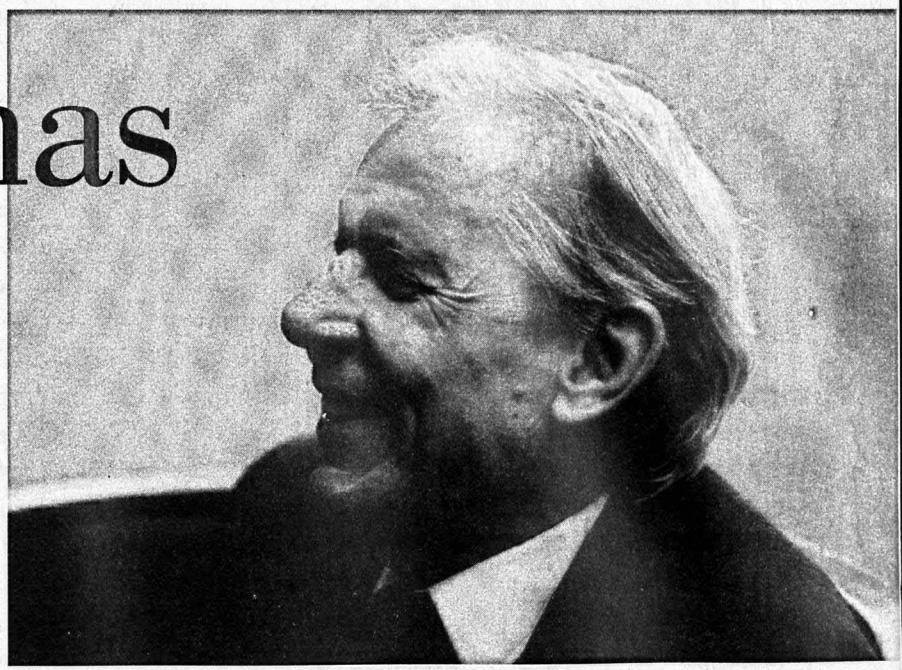
Wessels, Tom. 1997. *Reading the Forested Landscape: A Natural History of New England.* Woodstock, Vermont: The Countryman Press.

NOTES

1. Macy, Joanna, *Coming Back to Life: Practices to Reconnect Our Lives, Our World,* 1998, Gabriola Island, BC: New Society Publishers, p. 19.
2. Reiss, Warren, transcript of "Workshop on the Sheepscot River, Its Resources and Ecosystems," sponsored by the Sheepscot Valley Conservation Association, Inc., Alna, Maine, March 3, 1995.
3. Barth, Nick, Vice President of the Sheepscot Valley Conservation Association.
4. Note that although the land was returning to a wild state, the ecosystem was dramatically different from the one that preceded European settlement. New tree diseases, a lack of predators, a concrete dam near the river's mouth blocking anadromous fish passage, and myriad other factors contributed to this difference.
5. "Montville Comprehensive Plan" 1991.
6. One of many local conservation efforts was an attempt to shut down the Maine Yankee Nuclear Power Plant which had opened in 1972 on a peninsula at the mouth of the Sheepscot River.
7. The populations of Atlantic salmon in eight Maine rivers, including the Sheepscot, have been proposed for listing and protection under the Endangered Species Act. There are several other Maine rivers which host runs of salmon, but escaped domestic salmon (bred for aquaculture) have impacted the genetic make-up of wild salmon populations. Jeff Reardon, Northeast Conservation Director for Trout Unlimited, interviewed March 2000.
8. Examples of these sites include dams with no fish ladders, road-related erosion, deforested banks where solar heat makes the water temperature lethal to salmon, and areas where grazing livestock have access to the river.
9. Nudell, Martha, Communications Director, Land Trust Alliance, interviewed March 2000.
10. The Washington Post, October 2, 1998.
11. Cutler, M. Rupert, "Land Trusts and Wildlands Protection," *Wild Earth* 8(2), summer 1998. Cutler has served as the assistant director of The Wilderness Society, the senior vice president of the National Audubon Society, and the president of Defenders of Wildlife.

Thomas Berry



CULTURAL HISTORIAN THOMAS BERRY *founded the History of Religions Program at Fordham University and the Riverdale Center of Religious Research. He is the author of several books, including* The Dream of the Earth *(which won a Lannan Award for nonfiction),* The Universe Story *(co-authored with Brian Swimme), and the newly published* The Great Work: Our Way into the Future. *His distinguished and distinctive career began when he entered a monastery in 1934. In 1948 he received his Ph.D. in cultural studies from Catholic University and has studied Chinese and Sanskrit as part of his explorations of Buddhism and other Asian religions. Called the "bard of the new cosmology" by some, Berry is one of the seminal voices in the ecological spirituality movement.*

Interviewer ***Kristin DeBoer*** *is program coordinator at the regional conservation group RESTORE: The North Woods, which is working to protect wilderness and restore wolves to the Northeast. She spoke with Thomas Berry about wilderness, religion, and humanity's estrangement from Nature on April 18, 2000.*

I believe that the true, fundamental relationship between humans and the natural world is one of wonder, beauty, and intimacy.

Kristin DeBoer: In the last several centuries, primeval wilderness has been greatly diminished in North America and throughout the world due to rampant population growth and consumption. How has the loss of wilderness affected our society?

Thomas Berry: Whereas humans through most of our species' existence lived surrounded by wilderness, now wilderness is surrounded by human civilization. Remaining wilderness persists on a planet subject to much more human control. Humanity wields an extensive power of exploitation. We have a certain power of evocation, but more often we use our capacity to exploit natural phenomena.

That is the root of the problem. The relationship has become one of *use*, rather than awe. But I believe that the true, fundamental relationship between humans and the natural world is one of wonder, beauty, and intimacy. The human awakens to a Universe—the mind to a world of won-

photo courtesy Thomas Berry

der, the imagination to a world of beauty, the emotions to a world of intimacy. We need to experience wild Nature for our psychic development. We have made a tragedy of human-Earth relations because we have fashioned a relationship of exploitation. That is catastrophic.

The Universe and the wonderful natural world feed us psychically and physically. To isolate this relationship in terms of economic use for human comfort, at the expense of devastating the natural world, is a very deep perversion because it eliminates the possibility of psychic fulfillment. The outer world and inner worlds are integral—if we don't have certain outer experiences, our inner world is destitute.

Wilderness is the way in which the natural world achieves its full magnificence. In human-dominated landscapes, the delicate balance of life is so distorted that life forces dissolve, vegetation withers, species become extinct. Ecological and spiritual impoverishment result. The loss of wilderness is a loss of dynamism and creativity. Without it, natural selection can no longer operate fully—and natural selection is the essence of wilderness. It is the evolutionary process that shapes the ever-changing life of the planet.

Natural selection as a creative force is now limited because the planet is so extensively under human control. Humans have blindly assumed dominance as a controlling force. That is the supreme danger in new ventures like genetic engineering. We are tampering with life forces that are simply beyond our comprehension. We may be able to achieve some short-term goals, but we have no idea what the larger consequences of our actions will be. We absolutely need to protect wilderness, to leave vast areas alone to maintain that greater creative dynamism.

In a world so controlled by humans, we lose the intimate relationship described by Thoreau in his essay "Walking," where he says, "In wildness is the preservation of the World." He doesn't say in *wilderness*, but in *wildness*.

What is the difference in your mind between the words "wildness" and "wilderness"?

Well, *wildness* is a quality. The word *wild* implies a dynamic action, a vital process. *Wilderness* is an identifiable place where wildness is achieved. Wilderness is the ultimate expression of wild. The wild is the inner heart; it is the soul of wilderness.

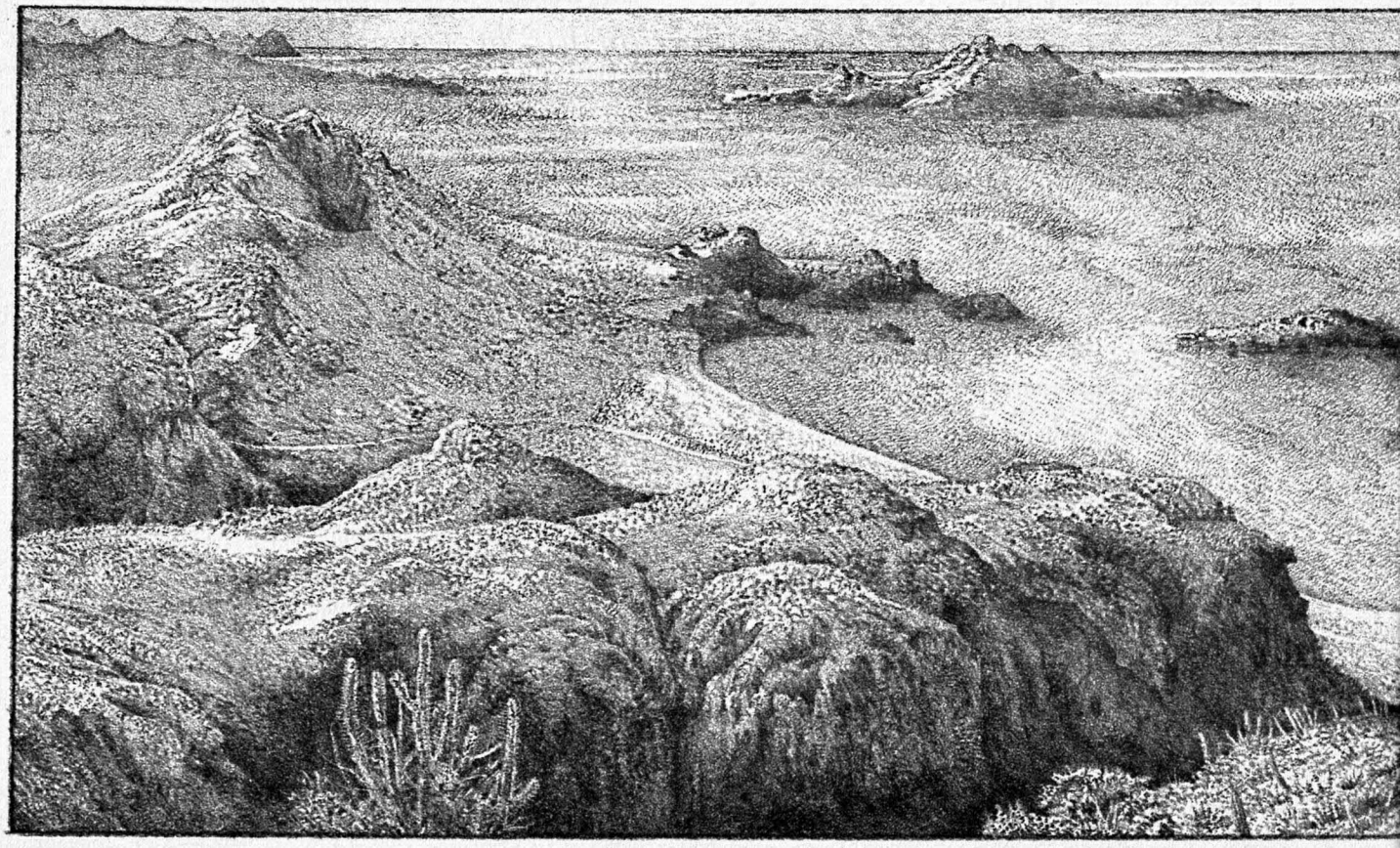


illustration by Davis Te Selle

One of the primary reasons for wilderness restoration and preservation is to maintain natural evolutionary processes. You point out that the story of the Earth and humans are one and the same, that there is only one evolutionary process. What is the value of preserving wilderness today in terms of maintaining the integrity of the entire evolutionary story?

Of course, the evolutionary story continues. Some of the ultimate dynamism is still determined by the natural world itself; the wind and the seasons are still largely beyond human control. Nature constantly adapts to the changes in the world. The problem now is that diversity is being diminished due to human action, unlike most of the Earth's history when evolution has been creating differentiation and complexity. Nature will adjust to whatever we do, but right now we are a force for destructive simplification, causing planet Earth to lose its biological diversity.

To allow evolution to maintain diversity we need large tracts of wilderness. You cannot preserve tigers in a five-acre plot. Wolves cannot survive in a limited area. They need vast areas. Nature requires this. Migratory birds, too, need extensive habitat through their migratory routes across the continents. So the larger pattern of Nature requires a vast territory to continue and flourish.

What humans do not yet seem to realize is that *we also* have a need for these vast wild areas. We need the wilderness for our inner life, not simply for itself. If we destroy our outer world, we destroy our inner world. If you take children outside to see the trees and play in the streams, you see how much we need this. It takes a Universe to educate a child, both intellectually and spiritually. We need to be outdoors, to see the clouds, to feel the rain, to run across the meadows. The wild expands the human soul. We need these experiences of wonder, beauty, and intimacy that exist between the small individual self and the great universal self. It is why are we delighted when we see a sunset, gaze at the stars, watch the butterflies. No being is nourished by itself. Everything is nourished by something outside of itself. The development of souls is just not possible without a gorgeous planet. That is why the Earth had to have a certain, special type of beauty develop before humans evolved. The beauty of the primeval Earth fed our human consciousness, our human imagination, our emotional needs.

It would be impossible for humans to live on the moon because of the loss of diversity for the mind, even if we could meet our physical needs. Likewise, we cannot live on Mars because that is a barren place. We would die as humans. Perhaps we could develop into some other mode of human—but we could not be humans as we are now. Our children would be so stunted in their psychic development. It's absurd. Our human consciousness has flourished because of the natural beauty of this planet.

The loss of wilderness is a loss of dynamism and creativity. Without it, natural selection can no longer operate fully—and natural selection is the essence of wilderness.

Since we have distorted so much of the natural beauty of the Earth, do you think we have already stunted our human psychic development?

Yes, the loss of wilderness has affected us profoundly. Let me say it this way: No people ever knew the Earth as well as we do in terms of its mechanistic processes, but no people have ever had less intimacy with the planet. We are shriveled up in our souls. We do not have the sense of the grandeur and wonder that was possible in an earlier phase of human existence when we were surrounded by wilderness. The modern human has endured a great loss of experience.

Historically, some conservationists like John Muir and Henry David Thoreau spoke of wilderness in overtly religious terms, as a place of beauty and spiritual renewal. Only recently has the wilderness movement begun to focus

more on protecting biological diversity and maintaining ecosystem services. In your view, how can religious experience continue to inform and inspire the work of wilderness protection today?

One may view the Universe as the manifestation of the divine. Another way of looking at it is that all our difficulties at the present time can be traced to a single cause—we have put a discontinuity between the natural world and human world. We give all the rights and value to the human world. Nature has no rights. No voice in our education, economic, and judicial systems. We need to reassert that there is a single community of life on Earth, and that community lives or dies together. Every being has three rights: the right to be, the right to habitat, and the right to fulfill its role in the ever-renewing processes of Nature.

Religion above all should recognize that the humanist, anthropocentric view of life is not adequate. We have to get beyond anthropocentrism in our spirituality and religion. The sacred community is the Universe, and more immediately—the Earth. If we distort the Earth community, then we have ruined the very presence of the divine. We will simply never be able to be in communion if we do this. Saving the natural world is saving the divine presence. The whole Universe manifests the divine more than any single being. Above all, religion should attend to protecting the whole community of life.

Sometimes religions focus almost exclusively on the human as the expression of the divine. Would you say that wilderness is a greater manifestation of the divine?

Of course the divine is immanent in the human, as it is present in every living thing. But the world of the human by itself is too constricted; we don't have any mind or consciousness apart from the Earth. We need the whole of it to develop ourselves. We cannot exist without everything else. The diversity of the natural world is needed in order to form the human mind. Why do we go to the ocean and the Grand Canyon? Why do we climb mountains? Why do we find wonder in the falling snow and the sunset? Because we need that sense of *vastness*. We need the infinite complexity of the Universe. Otherwise, the mind is too limited.

The major religious traditions are just beginning to address the ecological crisis. Yet, wilderness has always been a powerful image in the world's religions, such as Christ's forty days in the wilderness. How can the idea of wilderness today help transform our religious institutions?

Since we live in a largely humanized world, we have less sensitivity to transhuman forces. For example, there is a wonderful new exhibit on the story of the Universe at the American Museum of Natural History in New York. It is an unbelievable experience. What they have done is extraordinary; it leaves a person wondering how we could have discovered all these things about the way the Universe has unfolded. The exhibit tells a powerful story, but there is no idea of any creative force or vital principle at work. When we get such fantastic insight into the Universe's marvels, but that understanding is set completely apart from the sacred, we have lost something.

In the future, I believe we should absorb the Universe story into a religious context. In early forms of religion, humans validated their own existence by inserting themselves into the great liturgy, the celebration of the Universe. It is this communion with the Universe that evokes the sense of the divine. You would find this expressed in the religions of China and India, especially, where the ritual celebrations, the architecture, the music, and all the various aspects of human experience are expressed in concert with the Universe.

I propose that we begin to celebrate the emergent Universe as a manifestation of the divine. We can celebrate the sacred moments, which are times of transition. Darkness to light. Night to day. The solstices. Springtime. We can build our liturgies around these events. We can celebrate a Universe that has gone through a sequence, moving from lesser to greater complexity, lesser to greater consciousness. To a certain extent, we already have the experience of these celebrations. Christians, for example, celebrate within the cosmological context by having liturgy at dawn and evening vespers. Then there is the seasonal liturgy of the year. By learning to pray with the dawning of the sun and stars, one begins to sense the sacredness of the cosmos.

We can choose many transition moments to celebrate: when galaxies came into being; when stars collapsed, and gave forth the elements; when our Sun took shape; when the Earth formed. We can celebrate the first life evoked in a cell or the evolutionary moment when flowers first took form on Earth. We can select these important events and begin to incorporate them into our religious and spiritual traditions. The Easter vigil ceremony is supposed to be carried out in the depths of the night, when the story of creation is told. Once that story of creation was based on what little we knew. But now, through science, we know the story of the beginning of the Universe. Religious traditions can tell and celebrate the whole evolutionary story.

You have said that the human-Earth community is at a turning point. We can either move toward a technozoic age, dominated by mechanistic processes and technology, or toward an ecozoic age, where we learn to live in har-

mony with the natural world. What is the value and role of wilderness preservation within the larger context of discovering new ways to use resources more wisely and live more sustainably?

Wilderness is where all of the life-sustaining forces are. Wilderness is where we get our medicine, our food, and too many things to name. What we are doing right now is losing the genetic diversity of our food supply for all species and ourselves. Wilderness produces diversity. To lose the deep life forces associated with wilderness is to ruin the very forces of life.

Humans will need to find a tremendous psychic energy to shift course. What words of inspiration can you give wilderness advocates as we work toward protecting larger parts of the Earth as wild, self-willed land?

Well, working to protect the natural world is the most authentic expression of what a human being should be doing at the present time. There is a great urgency. Yet, people sometimes won't do for themselves what they'll do for their children. One of the deepest inspirations is to do what is good for the children, but not just the human children. We must include the children of the birds, of the trees, of the animals. If we are going to save ourselves, we need to save everything else. We cannot deprive the children of the natural world. The technological order cannot even begin to match the wonder of a flower. I always recall Saint Augustine's saying that "a picture of food will not nourish a person." Our imitations of Nature will not nourish us. Even the superb display of the Universe Story at the Natural History Museum is not comparable to real, living things. We need more than textbooks and computer simulations. We need the wonder of the dawn, the wonder of the forest, the wonder of a river, the wonder of a prairie. ☾

POETRY

To My Brothers

There are other ways I could offer you to see the world, ways to make amends

I could show you ten thousand Caribou trailing restless through gray talus peaks, as timeless as the beginning of things

Or the sure way a Grizzly digs for ground squirrels, effortlessly reaching and scraping, and how his silver tipped back riffles in the wind

I could show you the speckled beauty of Snow Geese lifting and turning toward the sun, flashing black on white, black on white

Or a Wolverine's angry breath fogging a pale winter sky, nose held hard against the breeze, like an impatient old man coming home

These are things that could change you

First, though, you would have to learn another language, one our fathers have forgotten

—R. Glendon Brunk

Book Reviews

Reviewed in this issue

Preserving Yellowstone's Natural Conditions: Science and the Perception of Nature

by James A. Pritchard ■ University of Nebraska Press, 1999 ■ 370 pages, $45 hardcover

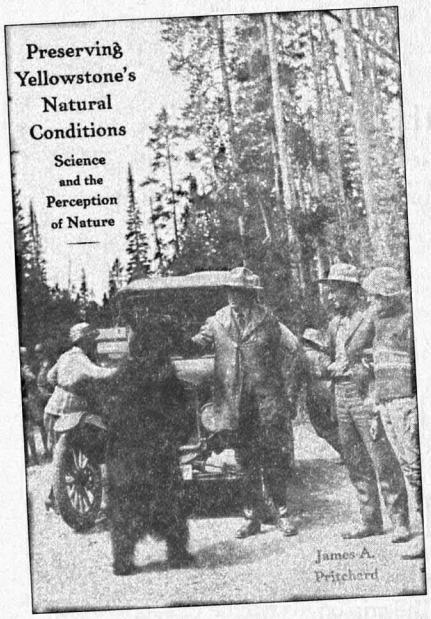
I'm a certified Yellowstone addict. For years I lived just north of the park, and spent countless hours hiking and observing Yellowstone's natural spectacle. Besides reading the landscape, I read scores of scientific reports, historical accounts, and general natural history descriptions of the park and surrounding region. As the author of two books on the park, I've done a fair amount of research into the park's history and ecology. It is with this perspective that I recommend James Pritchard's new book, *Preserving Yellowstone's Natural Conditions*, as the best single natural resource history of Yellowstone National Park to date.

This book is more than a litany of facts and dates about Yellowstone; the text steps beyond the park boundaries. Pritchard casts the Yellowstone story within the contextual framework of the larger philosophical and scientific debate over the human relationship to the land: What does it mean to "protect" an area, and how do we go about doing it?

A scholarly work that was the basis of Pritchard's Ph.D. dissertation, *Preserving Yellowstone's Natural Conditions* is a superbly researched book that has not left any significant sources uncovered. But unlike many well-known environmental historians such as William Cronon, Pritchard knows more than a little about ecology. His book offers a refreshing understanding of conservation science and provides a very credible overview of the significant scientific ideas that have shaped modern conservation biology. And unlike many scientists who appear to be incognizant of the larger swirling controversy about cultural relevance, Pritchard places this scientific context within the broader debate, successfully bridging the sometimes-gaping gulf between various disciplines.

Pritchard weaves the history of Yellowstone wildlife issues into the greater philosophical divide that I call the Agrarian Mind versus the Wild Mind. The Agrarian worldview dominates most natural resource agencies, university natural resource programs, and media. Agrarian minds see nothing particularly wrong with manipulating and attempting to manage the Earth, viewing the natural world as one giant garden that requires benevolent human intervention to maintain—the wise stewardship role. The Wild Mind posits that human attempts to manage Nature are hubris and that we ought to minimize our influence over significant chunks of the landscape to allow self-regulating and self-generating processes to operate.

As Pritchard notes early in the book, one of his major themes is to demonstrate how Yellowstone's wildlife management is a reflection of shifting cultural expectations about the goals of parks and natural areas, changes in scientific understanding, and the constant political influences of regional and national economic interests. To illustrate this concept, he focuses on the contentious decades-old debate over elk management in and around the park. From the creation of the park in 1872 to the 1930s, Yellowstone's managers sought to protect and propagate elk herds—which had suffered near-extinction from hunting and habitat losses—partly to provide a readily available wildlife spectacle for tourists. As the herds rebounded, some observers thought that elk numbers had grown to the point where the animals threatened to destroy their own habitat through overgrazing. Yellowstone officials began to allow trapping, shooting within the park, and hunting along the park borders to cull elk populations. (The Park Service also reduced elk numbers by providing animals for restoration efforts in other areas; elk herds now found in Canada's Banff National Park, Rocky Mountain National Park in Colorado, and other parks are descended from the Yellowstone population.) By the 1970s, park officials changed their policies as part of a larger shift in values that no longer advocated



direct human intervention in natural landscapes. The Park Service came to believe that human control of elk numbers was unwarranted, and that "natural regulation," primarily density-dependent factors like starvation and disease, would serve to limit population growth. At all points during this evolution in philosophy about management, there were vocal critics.

The issue of elk is not merely about whether Yellowstone's northern range is overgrazed; it is part of a much larger debate about how we manage natural areas worldwide. Indeed, the discourse over the relationship of humans to the natural world is at the core of most resource issues—for example, whether cows are a valid replacement for bison, or whether we ought to restore large predators like wolves across the landscape. Thus the stakes are high and the passions volatile.

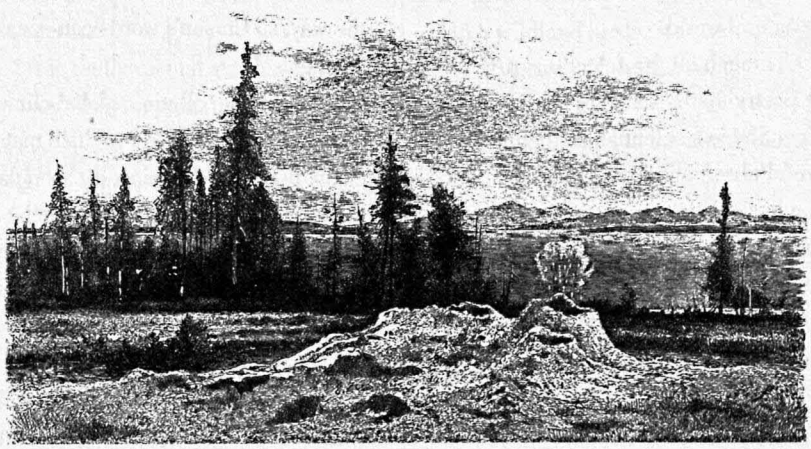
Pritchard does an excellent job of equitably laying out the arguments in this and many other debates, from how to manage grizzly bears to conflicts over bison and brucellosis. Though he accurately portrays all sides of the issues, clearly Pritchard tends toward agreeing with those who espouse minimal intervention in natural ecosystems rather than people like writer Alston Chase, a park critic, who champions direct human manipulation of landscapes.

Pritchard artfully challenges the perspective of Chase, Charles Kay, Fred Wagner, and other park critics who argue that people must manage the landscape because natural systems no longer operate. Much of the discussion hinges upon the influence of American Indians upon the landscape prior to European conquest. Critics like Chase, Kay, and Wagner claim that humans significantly altered natural patterns through fire, hunting, and other modifications of the landscape. Those who argue for minimalist intervention agree that Native Americans had some effects on the land, but question whether human influences were ever as pervasive as some assert. Similar disputes about the role of indigenous people and natural areas occur worldwide; Pritchard suggests that these questions ultimately are not answerable by science, but are part of the larger cultural debate over what we want our parks to be or represent.

There were some surprises in the book for me. For instance, although I was familiar with Adolph Murie and his work on Yellowstone coyotes and wildlife in Alaska, I discovered that Murie was one of the most forward-thinking ecologists of his time. Murie challenged none other than Starker Leopold and the conclusions of the 1963 Leopold Report that advocated for park managers to preserve vignettes of primitive landscapes through more management. Murie suggested that rather than preserve a particular landscape, parks should preserve the ecological processes that shape the land—and allow the landscape to evolve in whatever ways it might. When others wanted to manage for a particular point in time, Murie believed that parks already suffered from "too much management and not enough protection." This subtle difference in goals still divides many people involved in natural resource management issues in the Greater Yellowstone region and beyond.

Anyone interested in Yellowstone will find Pritchard's book an extraordinary resource, but this work is more than a history of the park. It is a case study of the evolution in thinking that has taken the conservation movement from preserving scenic landscapes to the goal of preserving ecologically functioning ecosystems and viable wildlife populations.

Reviewed by writer, photographer, and conservationist **GEORGE WUERTHNER**



Mud-Springs, Yellowstone, ca. 1870, by Thomas Moran

Lost Woods: The Discovered Writing of Rachel Carson

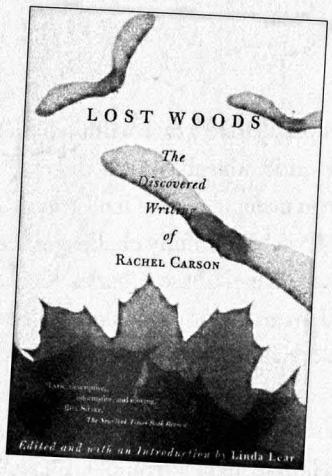
edited and with an introduction by Linda Lear ■ Beacon Press, 1998
267 pages, $16 paper

If you fear the written word has no power to change the world, remember Rachel Carson. A few thousand words in *Silent Spring*, and we stepped back from a deadly path of indiscriminate pesticide use.

Thirty-six years after her death, Carson's words continue to inspire a great range of people: conservationists, wilderness advocates, women in science, nature writers, ecologists, and all of us who are transfixed—as she was—by the Earth's wonder and mystery. Now, Linda Lear has assembled in *Lost Woods* a new collection which showcases the breadth of Carson's concern for the land and the powerful lyricism that made her one of America's most beloved authors. Produced between 1922 and 1963, these unpublished or little-known works include newspaper essays for *The Baltimore Sun*, field notes, nature writings penned during 15 years with the US Fish and Wildlife Service, speeches, articles, and letters. Arranged chronologically, they chart Carson's evolution from a young writer to a mature and influential advocate for the natural world.

Through all the selections runs the poetry that is Carson's trademark voice. She is a scientist, trained in careful observation, yet she also writes from her emotions, understanding that "the most memorable writings—though they be addressed to the intellect—are rooted in man's emotional reactions to that life stream of which he is a part."

Carson promotes natural history as a way to understand the world. She



shows us spiders floating in strong winds three miles above the Earth, plum-sized comb jellies emitting ghostly blue-white phosphorescence in the waters of Buzzards Bay, and the world undersea where "dogfish hunt in packs, and the ravenous bluefish, like roving buccaneers, take their booty where they find it." Her world is ancient, driven by mighty forces of geology and evolution. As an early practitioner of the new science of ecology, she traces links between organisms and their environment, and places humans firmly in that tangled web.

This is not a book to plow through with urgency. The selections stand alone, and there's no suspense. Treat them as morsels, some charming, some sobering, all fresh-faced but not naive to the complexities of Nature or the dark human threats that attend it. Lear edits the collection with a light hand, providing historical details and tracing thematic threads but also staying out of the way, so Carson's words can speak for themselves.

Chemical pollution, global climate change, biodiversity loss, selfish materialism, deep-sea dumping, overpopulation: the environmental ills Rachel Carson so eloquently decried have not been cured. She still has words for us.

Reviewed by **ANA RUESINK**, *director of science for the Vermont Chapter of The Nature Conservancy*

The Left Hand of Eden: Meditations on Nature and Human Nature

by William Ashworth
Oregon State University Press, 1999
256 pages, $19.95 paper

Of bureaucracies it is often said that the left hand doesn't know what the right is doing. In *The Left Hand of Eden*, author William Ashworth tries to get a handle on both. The grip on his handle categorizes our collective visions of a perfect world into two extremes: either "an untouched pristine planet" or an "endless cornucopia of consumer delights." Both visions have an attractive right hand that "beckons sensuously." And both have left hands that "rend and destroy."

Echoing the arguments of other wilderness critics, Ashworth contends that wilderness boundaries create static, dead space within, while offering carte-blanche to—and even encouraging—the powers of destruction without. He suggests that we need to jettison the theoretical human-vs.-Nature dichotomy and enter into a new partnership with Nature that represents the true unity of all things earthly. Wilderness is an easy target since these kinds of arguments often contain grains of truth. But they are also specious and misleading, no matter how "sensuously" they may beckon.

Ashworth weaves his philosophy into the framework of traditional nature writing, offering a memoir of experiences. He shares peerless credentials, obviously loves the natural world, helped create a Wilderness Area in Oregon, and admires such stalwart conservation heroes Aldo Leopold and Edward Abbey, offering pertinent insights into their work and legacies.

This forces him into a difficult position. He must both constantly apologize for what he calls his "Rattlesnake Epiphany" as well as defend it by proving his love for the Earth.

With one hand he writes "Oh, how I love wilderness, wildlands, roadless regions!" and with the other, "There will always be some places where ...we shall continue to want logging and roads to stay out altogether. But these places should be small—rarely more than a few hundred acres—and widely scattered." Ashworth's prose sparkles with immediacy and intimacy. Veiling controversy and contradiction with the voice of assured authority, *The Left Hand of Eden* is an embarrassment of riches leading its author to all the wrong conclusions.

Deconstructing the idea of separation from Nature, Ashworth reminds us that human beings are natural agents, subject to natural law, operating in a natural environment. Our homes are no less natural than the beaver's lodge, our cities no less so than the beehive. Maybe so, but this is slippery semantic territory. This kind of logic renders the word "natural" meaningless, equating the sling-shot with the nuclear warhead. By no means does it justify his flippant dismissal of vegetarianism as "unnatural." This kind of contradiction in terms bedevils Ashworth's arguments from beginning to end.

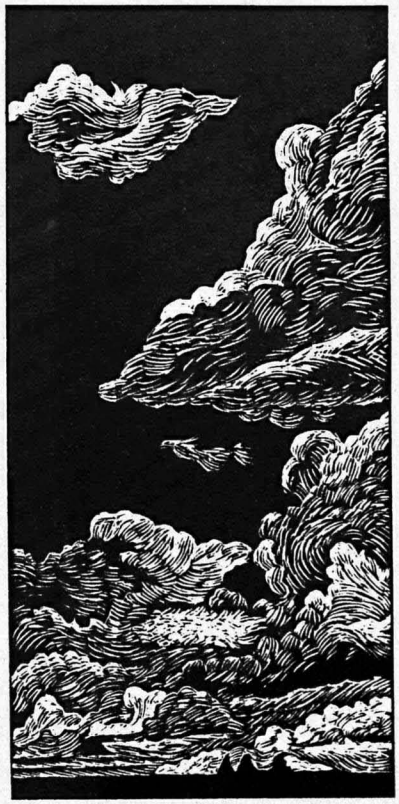


illustration by Evan Cantor

Ashworth rightly emphasizes the changeability of the natural world and our vain attempts to preserve it as we have found it. Nature knows no boundaries, ecological edges are fuzzy and disregard politically designated lines on maps. Fair enough. Yet he fails to recognize that this is a powerful reason to expand wilderness, not to shrink it.

Despite such suspect conclusions, many of his arguments are compelling. "It is not the wild that needs boundaries drawn about it, it is us." Yes, there is a monster loose upon the Earth and it is us. "Do not wonder where the journey leads. It leads you home." Yes, a thousand times yes. This is why we designated Wilderness in the first place and why we continue to love and defend those special places. The wild is our true home, our evolutionary place. It is where we came from and something deep within us reverberates in its presence.

"It is really us that we want to save—us, and our world as we want it to be, complete with wild places." Saving the Earth, whether pursued by old-fashioned conservation or biocentric science, is as much about the human perspective as it is anything else. We want the grizzly bear and snail darter to have a place in our vision of the world. Ashworth thinks we can have them without wilderness. He also thinks our obsession with preservation is excessive, that reality dictates that we cannot stop extinction, itself a natural process. The idea that we can stop all extinction is certainly hubris, but is that any reason to encourage it?

The essence of Ashworth's argument is that we should live in such harmony with the Earth that we would have no need for wilderness. This is wishful thinking, a pure and simple pipe-dream which displays ecological and political naivete.

Ashworth hearkens back to that still pertinent debate: Pinchot the resource conservationist vs. Muir the preservationist. Muir's fears were clearly justified and reasonable in light of his own times as well as our own. Ashworth notes that contemporary legislation has failed to protect Nature and throws the ball into Pinchot's court. "Careful use of resources is the key to preserving them. It not only works; it is the only thing that ever has." Baloney. Environmental law in the 20th century has made tremendous progress towards preserving natural systems and their inhabitants. With so much documented success, why quit now?

Ashworth's dream of integration, inclusion, and flexibility is a laudable goal, but it cannot now nor ever replace the ecosystemic integrity of large wildland areas. It is naive, relying no less on faith than religion. As often as he returns to the nature of Nature, his vision is the most "unnatural" of solutions. That Ashworth denies the value of wilderness in the process makes his not only a severely diminished, but a crippled, vision of the perfect world.

Reviewed by **EVAN CANTOR,**
a Colorado-based writer and artist

The Western Range Revisited:
Removing Livestock from Public Lands to Conserve Native Diversity

by Debra L. Donahue
University of Oklahoma Press, 1999
388 pages, $15 paper

With the publication of *The Western Range Revisited: Removing Livestock from Public Lands to Conserve Native Diversity*, Debra Donahue has authored the first book ever to focus exclusively on the history, law, politics, economics, and ecological impacts of domestic livestock grazing on Bureau of Land Management lands. Donahue is a law professor at the University of Wyoming, with a Masters degree in wildlife biology and nearly three decades of experience with the federal government and the National Wildlife Federation studying, monitoring, and advocating for arid western ecosystems. Her book reflects the scope and depth of her career as she weaves law, biology, and economics together to present a compelling case to remove livestock from the public domain.

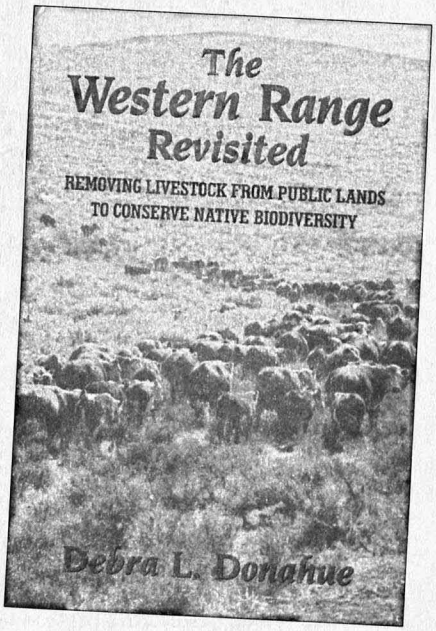
May Professor Donahue be tenured (!), as her treatise challenging the economic and social contributions (and delineating the ecological effects) of public land ranching strikes at the heart of her own state's love affair with the western wrangler, whose image is branded on every automobile license plate, public building, and University of Wyoming football helmet. In response, the president of the Wyoming state senate—who admitted he hasn't read her book—even drafted a bill to abolish the university's law school.

Donahue's ecological analysis draws heavily on conservation biology, including the writings of Reed Noss and others. She details the impacts of grazing on native biodiversity, vegetation, water, cryptobiotic crusts, invasive species, fire regimes, carbon cycles, fish and wildlife. She also sets up—and then debunks—the major arguments in favor of livestock grazing advanced by grazing apologists masquerading as scientists.

As part of an economic analysis, Donahue lists the myriad of government subsidies and other entitlements enjoyed by public land ranchers. After documenting the amount of subsidies these ranchers receive, Donahue describes how few the beneficiaries are, and how their political power far exceeds their economic "contribution" to local and national economies; citing Montana economist Thomas Power, she notes that public land grazing is actually a sink, rather than a source of economic growth.

Our democratic sensibilities are quickly offended by Donahue's chapters on the social and cultural advantages ranchers receive over other users of public land. Many more people (taxpayers) use and enjoy the public lands for hiking, hunting, fishing, and other activities, and do so with little or no discernible impact, than those few that run livestock at the expense of flora, fauna, water, and wilderness. And, while they make no profit, public land ranchers are being paid to play cowboy and degrade the land and experience of other public land users.

Legally, Donahue makes a convincing case that Congress need not



act to allow the end of livestock grazing on public land. Despite the pervasive nature of public land livestock grazing, it is not required by law (feral horses and burros are another matter). Federal law does mandate, however, that public land be conserved and used sustainably. Under the present grazing regime it is impossible to argue that conservation standards are being met.

Donahue provides perspective for her book by relating the sordid history of public land livestock grazing in the first two chapters, which is vital to understanding how we arrived at the present situation. Only by knowing the history of an issue can we see the way to the future we want. Donahue tells us that ending public land grazing is ecologically imperative, economically rational, and socially fair. Unfortunately, not being a political scientist, she offers no political solutions to end grazing. That is a task for others. And for those trying, *The Western Range Revisited* is both enlightening and emboldening.

Reviewed by freelance environmental agitator **ANDY KERR** *(andykerr@andykerr.net) and* **MARK SALVO** *(mark@sagegrouse.org), grasslands advocate for American Lands*

ANNOUNCEMENTS

Southern Rockies Report The Southern Rockies Ecosystem Project announces the publication of *The State of the Southern Rockies Ecoregion* report. This major assessment—of territory stretching from southern Wyoming to northern New Mexico—explores land use history, measures of biodiversity, and terrestrial and aquatic ecosystems. Sections on protected areas and conservation recommendations provide valuable tools for wilderness activists and scientists. 137 pages, full color. To purchase a copy contact SREP, PO Box 1182, Nederland, CO, 80466, 303-258-0433, http://colorado.edu/srep.

Fire Publications A new report from American Lands' Western Fire Ecology Center, "Money to Burn: The Economics of Fire and Fuels Management," examines how fire suppression on the national forests has become a pork-barrel program that is degrading forest and aquatic ecosystems. See www.americanlands.org/forestweb/fire.htm for a copy of the paper; for more information contact Timothy Ingalsbee at: fire@efn.org. Another report, "Fire Weather," concludes that logging and logging roads increase the chance of wildland fire. This 229-page Forest Service document is available from the Government Printing Office, Stock No. 001-000-0193-0/Catalogue No. A 1.76:360.

Carnivores 2000 Defenders of Wildlife's third national conference will be held in Denver, Colorado from November 12–15, 2000 at the Omni Interlocken Resort Hotel. Carnivores 2000 will focus on predator biology and conservation in the 21st century. Contact Heather Pellet, Defenders of Wildlife, 1101 14th St., NW, Suite 1400, Washington, DC 20005, 202-789-2844 ext. 315, carnivores2000@defenders.org.

Northeastern Wilderness Conference
"Something Wild, Something Managed: Wilderness in the Northeast Landscape" is Middlebury College's Bicentennial Conference, October 5–6, 2000. Sessions include, "Northeastern Wilderness in Context," "The Values of Wilderness," and "Surrounding Wilderness with Sustainably Managed Lands." Bill McKibben will give the keynote on Friday. Contact Janet Wiseman, 802-443-5710, jwiseman@middlebury.edu.

Broadwalk and Wilderness Conference
Great Old Broads for Wilderness host "The Broadwalk and Wilderness Conference," September 11–17, in Reno, NV. Learn the basics of wilderness inventory work, then head out into the wildlands of Nevada to hike and conduct wilderness inventory from Monday until Friday. The conference follows on Saturday and Sunday. Email broads@greatoldbroads.org or visit www.greatoldbroads.org for more information.

National Mountain Conference The National Mountain Conference, September 14–16 in Golden, CO, is cosponsored by the Appalachian Mountain Club, American Alpine Club, American Hiking Society, Colorado Mountain Club, The Mountaineers, and the World Commission on Protected Areas. The effects of recreation on mountain ecosystems and controlling sprawl on mountain slopes are among the issues to be addressed under this year's theme, "Stewardship and Human Powered Recreation for the New Century." Contact the conference coordinator, 603-466-2721 ext. 184, melhov@landmarknet.net, or visit www.nationalmtnconference.org.

Forest Reform Rally The 14th annual National Forest Reform Rally is set for September 15–17 near Houston, TX. The Texas Committee on Natural Resources joins the Forest Reform Network and American Lands Alliance in offering field trips into the Sam Houston National Forest and speakers on current forest topics. Contact Janice Bezanson, 512-327-4119, bezanson@eden.com.

Natural Areas Conference The Natural Areas Association's 27th annual conference will be held October 16–20 in St. Louis, MO. Under the theme, "Managing the Mosaic: Connecting People and Natural Diversityin the 21st Century," the conference explores biodiversity conservation, including sessions on exotic species control, ecoregional planning, and public/private partnerships. Call Kate Leary at 573-751-4115 ext. 183 or visit www.conservation.state.mo.us/nac.

ARTISTS THIS ISSUE

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CALL FOR POSTER ABSTRACTS!

Managing River Flows for Biodiversity: A Conference on Science, Policy and Conservation Action

July 30-August 2, 2001
Colorado State University, Fort Collins (CO)

Abstracts of posters are invited for this conference. Posters may cover themes related to managing river flows for biodiversity, including case studies on particular flow restoration efforts. Deadline for abstracts is December 31, 2000. Notification for accepted posters will follow by the end of January, 2001. Please send all abstracts to Nicole Silk by e-mail (nsilk@tnc.org) by or before the deadline listed above.

This conference will expose attendees to real and perceived conflicts between meeting ecosystem needs and human demands for water, discuss the state of science with respect to flow requirements for biodiversity conservation, and present case studies from across the United States and other countries where practitioners are working to meet human demands for water while also providing for ecosystem health. These case studies include: Upper Colorado River, Missouri River, ACF/ACT River Basins, Sacramento/San Joaquin Bay Delta System, Zion National Park, Trinity River, Pantanal, Okavanga Delta, San Pedro River, and the Truckee River. This conference is designed for water managers, fish and wildlife biologists, non-governmental organizations, attorneys, river scientists and other individuals and consultants influencing water management decisions. For more information about this conference, please visit www.freshwaters.org.

We list here only each issue's major articles, by partial title or subject. For a more complete listing, request a comprehensive Back Issues List (see form, next page). Note: (✖) = issue is sold out, but photocopies of articles available.

BACK ISSUES

1/Spring 1991 • Ecological Foundations for Big Wilderness, Howie Wolke on The Impoverished Landscape, Reed Noss on Florida Ecosystem Restoration, Biodiversity & Corridors in Klamath Mtns., Earth First! Wilderness Preserve System, GYE Marshall Plan, Dolores LaChapelle on Wild Humans, Dave Foreman "Around the Campfire," and Bill McCormick's Is Population Control Genocide?

2/Summer 1991 • Dave Foreman on the New Conservation Movement, Ancient Forests: The Perpetual Crisis, Wolke on The Wild Rockies, Grizzly Hunting in Montana, Noss on What Wilderness Can Do for Biodiversity, Mendocino NF Reserve Proposal, Christopher Manes on the Cenozoic Era, and Part 2 of McCormick's Is Population Control Genocide?

3/Fall 1991 • (✖) The New Conservation Movement continued. Farley Mowat on James Bay, George Washington National Forest, the Red Wolf, George Wuerthner on the Yellowstone Elk Controversy, The Problems of Post Modern Wilderness by Michael P. Cohen and Part 3 of McCormick's Is Population Control Genocide?

4/Winter 1991/92 • Devastation in the North, Rod Nash on Island Civilization, North American Wilderness Recovery Strategy, Wilderness in Canada, Canadian National Parks, Hidden Costs of Natural Gas Development, A View of James Bay from Quebec, Noss on Biologists and Biophiles, BLM Wilderness in AZ, Wilderness Around the Finger Lakes: A Vision, National ORV Task Force

5/Spring 1992 • Foreman on ranching, Ecological Costs of Livestock, Wuerthner on Gunning Down Bison, Mollie Matteson on Devotion to Trout and Habitat, Walden, The Northeast Kingdom, Southern Rockies Ecosystem Protection, Conservation is Good Work by Wendell Berry, Representing the Lives of Plants and Animals by Gary Paul Nabhan, and The Reinvention of the American Frontier by Frank and Deborah Popper

6/Summer 1992 • The Need for Politically Active Biologists, US Endangered Species Crisis Primer, Wuerthner on Forest Health, Ancient Forest Legislation Dialogue, Toward Realistic Appeals and Lawsuits, Naomi Rachel on Civil Disobedience, Victor Rozek on The Cost of Compromise, The Practical Relevance of Deep Ecology, and An Ecofeminist's Quandary

7/Fall 1992 • How to Save the Nationals, The Backlash Against the ESA, Saving Grandfather Mountain, Conserving Diversity in the 20th Century, Southern California Biodiversity, Old Growth in the Adirondacks, Practicing Bioregionalism, Biodiversity Conservation Areas in AZ and NM, Big Bend Ecosystem Proposal, George Sessions on Radical Environmentalism in the 90s, Max Oelschlaeger on Mountains that Walk, and Mollie Matteson on The Dignity of Wild Things

8/Winter 1992/93 • Critique of Patriarchal Management, Mary O'Brien's Risk Assessment in the Northern Rockies, Is it Un-Biocentric to Manage?, Reef Ecosystems and Resources, Grassroots Resistance in Developing Nations, Wuerthner's Greater Desert Wildlands Proposal, Wolke on Bad Science, Homo Carcinomicus, Natural Law and Human Population Growth, Excerpts from *Tracking & the Art of Seeing* and *Ghost Bears*

Wildlands Project Special Issue #1 • TWP (North American Wilderness Recovery Strategy) Mission Statement, Noss's Wildlands Conservation Strategy, Foreman on Developing a Regional Wilderness Recovery Plan, Primeval Adirondacks, Southern Appalachians Proposal, National Roadless Area Map, NREPA, Gary Snyder's Coming into the Watershed, Regenerating Scotland's Caledonian Forest, Geographic Information Systems

9/Spring 1993 • The Unpredictable as a Source of Hope, Why Glenn Parton is a Primitivist, Hydro-Quebec Construction Continues, RESTORE: The North Woods, Temperate Forest Networks, The Mitigation Scam, Bill McKibben's Proposal for a Park Without Fences, Arne Naess on the Breadth and Limits of the Deep Ecology Movement, Mary de La Valette says Malthus Was Right, Noss's Preliminary Biodiversity Plan for the Oregon Coast, Eco-Porn and the Manipulation of Desire

10/Summer 1993 • Greg McNamee questions Arizona's Floating Desert, Foreman on Eastern Forest Recovery, Is Ozone Affecting our Forests?, Wolke on the Greater Salmon/Selway Project, Deep Ecology in the Former Soviet Union, Topophilia, Ray Vaughan and Nedd Mudd advocate Alabama Wildlands, Incorporating Bear, The Presence of the Absence of Nature, Facing the Immigration Issue

11/Fall 1993 • Crawling by Gary Snyder, Dave Willis challenges handicapped access developments, Biodiversity in the Selkirk Mtns., Monocultures Worth Preserving, Partial Solutions to Road Impacts, Kittatinny Raptor Corridor, Changing State Forestry Laws, Wild & Scenic Rivers Act, Wuerthner Envisions Wildland Restoration, Toward [Population] Policy That Does Least Harm, Dolores LaChappelle's Rhizome Connection

12/Winter 1993/94 • A Plea for Biological Honesty, A Plea for Political Honesty, Endangered Invertebrates and How to Worry About Them, Faith Thompson Campbell on Exotic Pests of American Forests, Mitch Lansky on The Northern Forest, Human Fear Diminishes Diversity in Rocky Mtn. Forests, Gonzo Law #2: The Freedom of Information Act, Foreman on NREPA and the Evolving Wilderness Area Model, Rocky Mtn. Nat. Park Reserve Proposal, Harvey Locke on Yellowstone to Yukon campaign

13/Spring 1994 • Ed Abbey posthumously decries The Enemy, David Clarke Burks's Place of the Wild, Ecosystem Mismanagement in Southern Appalachia, Mohawk Park Proposal, RESTORE vs. Whole-Tree Logging, Noss & Cooperrider on Saving Aquatic Biodiversity, Atlantic Canada Regional Report, Paul Watson on Neptune's Navy, The Restoration Alternative, Intercontinental Forest Defense, Failures of Babbitt and Clinton, Chris McGrory-Klyza outlines Lessons from Vermont Wilderness

14/Summer 1994 • Bil Alverson's Habitat Island of Dr. Moreau, Bob Leverett's Eastern Old Growth Definitional Dilemma, Wolke against Butchering the Big Wild, FWS Experiments on Endangered Species, Serpentine Biodiversity, Andy Kerr promotes Hemp to Save the Forests, Mapping the Terrain of Hope, A Walk Down Camp Branch by Wendell Berry, Carrying Capacity and the Death of a Culture by William Catton Jr., Industrial Culture vs. Trout

15/Fall 1994 • BC Raincoast Wilderness, Algoma Highlands, Helping Protect Canada's Forests, Central Appalachian Forests Activist Guide, Reconsidering Fish Stocking of High Wilderness Lakes, Using General Land Office Survey Notes in Ecosystem Mapping, Gonzo Law #4: Finding Your Own Lawyer, The Role of Radio in Spreading the Biodiversity Message, Jamie Sayen and Rudy Engholm's Thoreau Wilderness Proposal

16/Winter 1994/95 • Ecosystem Management Cannot Work, Great Lakes Biodiversity, Peregrine Falcons in Urban Environments, State Complicity in Wildlife Losses, How to Burn Your Favorite Forest, ROAD-RIPort #2, Recovery of the Common Lands, A Critique and Defenses of the Wilderness Idea by J. Baird Callicott, Dave Foreman, and Reed Noss

17/Spring 1995 • Christopher Manes pits Free Marketeers vs. Traditional Environmentalists, Last Chance for the Prairie Dog, interview with tracker Susan Morse, Befriending a Central Hardwood Forest part 1, Economics for the Community of Life: Part 1, Minnesota Biosphere Recovery, Michael Frome insists Wilderness Does Work, Dave Foreman looks at electoral politics, Wilderness or Biosphere Reserve: Is That a Question?, Deep Grammar by J. Baird Callicott

18/Summer 1995 • (✖) Wolke on Loss of Place, Dick Carter on Utah Wilderness: The First Decade, *WE* Reader Survey Results, Ecological Differences Between Logging and Wildfire, Bernd Heinrich on Bumblebee Ecology, Michael Soulé on the Health Implications of Global Warming, Peter Brussard on Nevada Biodiversity Initiative, Preliminary Columbia Mtns. Conservation Plan, Foreman on advocacy politics, Environmental Consequences of Having a Baby in the US

19/Fall 1995 • (✖) Wendell Berry on Private Property and the Common Wealth, Eastside Forest Restoration, Global Warming and The Wildlands Project, Paul J. Kalisz on Sustainable Silviculture in Eastern Hardwood Forests, Old Growth in the Catskills and Adirondacks, Threatened Eastern Old Growth, Andy Kerr on Cow Cops, Dave Foreman on libertarianism, Fending of SLAPPS, Using Conservation Easements to save wildlands, David Orton on Wilderness and First Nations

20/Winter 1995/96 • ***TWP Special Issue #2.*** Testimony from Terry Tempest Williams, Foreman's Wilderness: From Scenery to Strategy, Noss on Science Grounding Strategy and The Role of Endangered Ecosystems in TWP, Roz McClellan explains how Mapping Reserves Wins Commitments, Second Chance for the Northern Forest: Headwaters Proposal, Klamath/Siskiyou Biodiversity Conservation Plan, Wilderness Areas and National Parks in Wildland Proposal, ROAD-RIP and TWP, Steve Trombulak, Jim Strittholt, and Reed Noss confront Obstacles to Implementing TWP Vision

21/Spring 1996 • Bill McKibben on Finding Common Ground with Conservatives, Public Naturalization Projects, the Complexities of Zero-cut, Curt Steger on Ecological Condition of Adirondack Lakes, Acid Rain in the Adirondacks, Bob Mueller on Central Appalachian Plant Distribution, Brian Tokar on Biotechnology vs. Biodiversity, Stephanie Mills on Leopold's Shack, Soulé asks Are Ecosystem Processes Enough?, Poems for the Wild Earth, Limitations of Conservation Easements, Kerr on Environmental Groups and Political Organization

22/Summer 1996 • McKibben on Text, Civility, Conservation and Community, Eastside Forest Restoration Forum, Grazing and Forest Health, debut of Landscape Stories department, Friends of the Boundary Waters Wilderness, Foreman on Public Lands Conservation, Private Lands in Ecological Reserves, Public Institutions Twisting the Ear of Congress, Laura Westra's Ecosystem Integrity and the Fish Wars, Caribou Commons Wilderness Proposal for Manitoba

23/Fall 1996 Religion and Biodiversity, Eastern Old Growth: Big Tree Update, Gary Nabhan on Pollinators and Predators, South African Biodiversity, Dave Foreman praises Paul Shepard, NPS Prescribed Fires in the Post-Yellowstone Era, Alaska: the Wildlands Model, Mad Cows and Montanans, Humans as Cancer, Wildlands Recovery in Pennsylvania

24/Winter 1996/97 • (✖) Opposing Wilderness Deconstruction: Gary Snyder, Dave Foreman, George Sessions, Don Waller, Michael McCloskey respond to attacks on wilderness. The Aldo Leopold Foundation, Grand Fir Mosaic, eastern old-growth report, environmental leadership. Andy Robinson on grassroots

fundraising, Edward Grumbine on Using Biodiversity as a Justification for Nature Protection, Rick Bass on the Yaak Valley, Bill McCormick on Reproductive Sanity, and portrait of a Blunt-nosed Leopard Lizard

25/Spring 1997 • (✖) Perceiving the Diversity of Life: David Abram's Returning to Our Animal Senses, Stephanie Kaza on Shedding Stereotypes, Jerry Mander on Technologies of Globalization, Christopher Manes's Contact and the Solid Earth, Connie Barlow Re-Stories Biodiversity by Way of Science, Imperiled Freshwater Clams, WildWaters Project, eastern old-growth report, American Sycamore, Kathleen Dean Moore's Traveling the Logging Road, Mollie Matteson's Wolf Re-storyation, Maxine McCloskey on Protected Areas on the High Seas

26/Summer 1997 • (✖) Doug Peacock on the Yellowstone Bison Slaughter, Reed Noss on Endangered Major Ecosystems of the United States, Dave Foreman challenges abiologists, Hugh Iltis challenges abiologists, Virginia Abernethy explains How Population Growth Discourages Environmentally Sound Behavior. Gaian Ecology and Environmentalism, The Bottom Line on Option Nine, Eastern Old Growth Report, How Government Tax Subsidies Destroy Habitat, Geology in Reserve Design, part 2 of NPS Prescribed Fires in the Post-Yellowstone Era

27/Fall 1997 • (✖) Bill McKibben discusses Job and Wilderness, Anne LaBastille values Silence, Allen Cooperrider and David Johnston discuss Changes in the Desert, Donald Worster on The Wilderness of History, Nancy Smith on Forever Wild Easements in New England, Foreman explores fear and loathing of wilderness, George Wuerthner on Subdivisions and Extractive Industries, More Threatened Eastern Old Growth, part 2, the Precautionary Principle, North and South Carolina's Jocasse Gorges, Effects of Climate Change on Butterflies, the Northern Right Whale, Integrating Conservation and Community in the San Juan Mtns., Las Vegas Leopard Frog

28/Winter 1997/98 • ***Overpopulation Issue*** explores the factors of the I=PAT model: Gretchen Daily & Paul Ehrlich on Population Extinction and the Biodiversity Crisis, Stephanie Mills revisits nulliparity, Alexandra Morton on the impacts of salmon farming, Sandy Irvine punctures pro-natalist myths, William Catton Jr. on carrying capacity, Virginia Abernethy considers premodern population planning, Stephanie Kaza on affluence and the costs of consumption, Kirkpatrick Sale criticizes the Technological Imperative, McKibben addresses overpopulation One (Child) Family at a Time, Foreman on left-wing cornucopianism Interview with Stuart Pimm, Resources for Population Publications & Overpopulation Action, Spotlight on Ebola Virus

29/Spring 1998 • (✖) Interview with David Brower, Anthony Ricciardi on the Exotic Species Problem and Freshwater Conservation, George Wuerthner explores the Myths We Live By, Dave Foreman critique of "environment," forum on ballot initiatives, John Clark & Alexis Lathem consider Electric Restructuring, Paul Faulstich on Geophilia, critiques of motorized wreckreation, Mitch Friedman's Earth in the Balance Sheet, Anne Woiwode on Pittman Robinson, Peter Friederici's Tracks, Eastern Old Growth, Connie Barlow's Abstainers

30/Summer 1998 • ***Wildlands Philanthropy*** tradition discussed by Robin Winks, John Davis on Private Wealth Protecting Public Values, Doug Tompkins on Philanthropy, Cultural Decadence, & Wild Nature, Sweet Water Trust saves wildlands in New England, A Time Line of Land Protection in the US, Rupert Cutler on Land Trusts and Wildlands Protection, profiles of conservation heroes Howard Zahniser, Ernie Dickerman, & Mardy Murie, Michael Frome recollects the wilderness wars, David Carle explores early conservation activism and National Parks, and Barry Lopez on The Language of Animals

31/Fall 1998 • ***Agriculture & Biodiversity*** examined by Paul Shepard, Catherine Badgley, Wes Jackson, and Frieda Knobloch, Scott Russell Sanders on Landscape and Imagination, Amy Seidl addresses exotics, Steve Trombulak on the Language of Despoilment, George Wuerthner & Andy Kerr on livestock grazing, **Rewilding** paper by Michael Soulé & Reed Noss, Gary Nabhan critiques the Terminals of Seduction, Noss asks whether conservation biology needs natural history, Y2Y part 2, profile of Dan Luten

32/Winter 1998/99 • ***A Wilderness Revival*** perspectives from Bill Meadows on the American Heart, Juri Peepre on Canada, Jamie Sayen on the Northern Appalachians, and John Elder on the edge of wilderness, Louisa Willcox on grizzlies, politics from Carl Pope, Ken Rait's Heritage Forests, Jim Jontz's Big Wilderness Legislative Strategy, Debbie Sease & Melanie Griffin's stormy political forecast, Dave Foreman on the River Wild as metaphor, Mike Matz's Domino Theory, Wilderness campaign updates from Oregon, California, Nevada, Grand Canyon, New Mexico, Colorado, and Utah, NREPA, focal species paper by Brian Miller et al.

33/Spring 1999 • ***Coming Home to the Wild*** Flo Shepard, Paul Rezendes, Glendon Brunk, and Kelpie Wilson imagine rewilding ourselves, Paul Martin and David Burney suggest we Bring Back the Elephants! and Connie Barlow discusses Rewilding for Evolution, Freeman House on restoring salmon, John Davis on Anchoring the Millennial Ark, Chris Genovali exposes risks to Canada's Great Bear Rainforest, Madsen and Peepre on saving Yukon's rivers, Bryan Bird on roads and snags, George Wuerthner on population growth, Brock Evans uses wild language, Dave Foreman studies the word wilderness, and John Terborgh and Michael Soulé's "Why We Need Megareserves: Large-scale Networks and How to Design Them"

34/Summer 1999 • ***Carnivore Ecology and Recovery*** "The Role of Top Carnivores in Regulating Terrestrial Ecosystems" by Terborgh et al., Todd Wilkinson on the Yellowstone Grizzlies Delisting Dilemma, Wolves for Oregon, Carnivores Rewilding Texas, fire ecologist Tim Ingalsbee suggests we Learn from the Burn, David Orr continues the Not-So-Great Wilderness Debate, Tom Fleischner on Revitalizing Natural History, Jim Northup remembers Wildlands Philanthropist Joseph Battell, the Continuing Story of the American Chestnut

35/Fall 1999 • Nina Leopold Bradley, David Ehrenfeld, Terry Tempest Williams, and Curt Meine celebrate Leopold's legacy, wildlands philanthropy saves forests in Washington & California, Thomas Vale dispels the Myth of the Humanized Landscape, articles on Indigenous Knowledge and Conservation Policy in Papua New Guinea and threats to northwest Siberia's cultural & biological diversity, Janisse Ray takes us to the Land of the Longleaf, Robert Hunter Jones critiques NPS fire policy at Crater Lake, State of the Southern Rockies and the Grand Canyon Ecoregions, Sizing Up Sprawl

36/Winter 1999/2000 • ***Vision*** Jamie Sayen compares abolitionism and preservationism, Winona LaDuke rethinks the Constitution, Donella Meadows on shaping our future, Deborah & Frank Popper explore the Buffalo Commons, and Michael Soulé on networks of people and wildlands; Dave Foreman puts our extinction crisis in a 40,000-year context, Gary Paul Nabhan update on monarch butterflies and transgenic corn, David Maehr on South Florida carnivores, Michael Robinson discusses politics of jaguars and wolves in the Southwest, Reed Noss reserve design for the Klamath-Siskiyou, Andy Kerr's Big Wild legislative strategy, George Wuerthner on local control, Roger Kaye explores the Arctic National Wildlife Refuge

37/ Spring 2000 • ***The Wildlands Project Special Issue*** E.O. Wilson offers a personal brief for TWP, Harvey Locke suggests a balanced approach to sharing North America. Sky Islands (AZ, NM) section: 4 articles on the Sky Islands Wildlands Network by Dave Foreman et al. address the elements of a conservation plan, healing the wounds, and implementation, color map of the draft proposal, Wildlands Project efforts in Mexico's Sierra Madre Occidental, David Petersen's "Baboquivari!", Leopold's legacy in New Mexico. Wildlands networks proposals for the Central Coast of British Columbia by M.A. Sanjayan et al. & the Wild San Juans of Colorado by Mark Pearson. Mike Phillips on conserving biodiversity on & beyond the Turner lands, the economy of Y2Y, roadless area protection by Jim Jontz.

Additional *Wild Earth* Publications

Old Growth in the East: A Survey by Mary Byrd Davis

Special Paper #1: *How to Design an Ecological Reserve System* by Stephen C. Trombulak

Special Paper #2: *While Mapping Wildlands, Don't Forget the Aliens* by Faith T. Campbell

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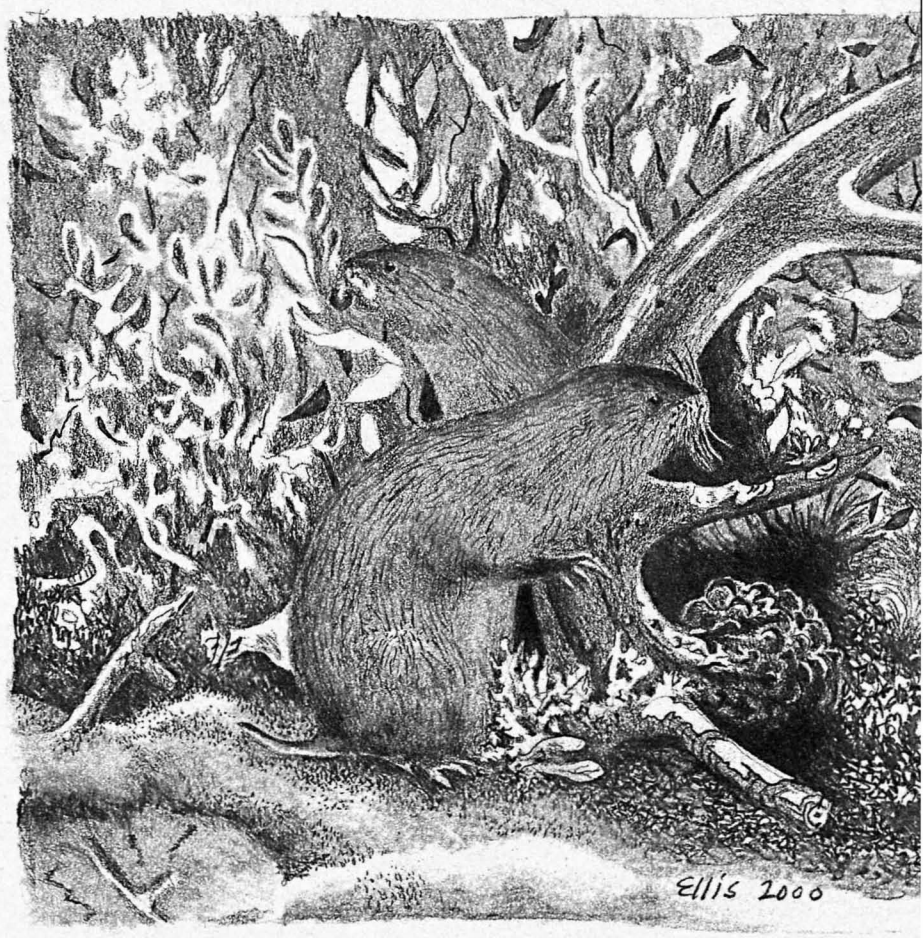

For many of us, our only image of lemmings is a pack of fuzzy creatures hurling themselves off a cliff into the sea. Happily, this is a myth. While it is true that a few species of lemmings, in periods of explosive population growth, do set out for new terrain in migratory swarms—and occasionally drown—no species of lemming commits mass suicide.

The northern bog lemming, *Synaptomys borealis,* defies the myth further: it neither migrates nor is it even a true lemming, being only a distant relative of the genus *Lemmus.* Nevertheless, this thickset, grizzled rodent is mostly true to its name, living in cold bogs, under sphagnum mounds and in old logs, from Labrador to Hudson Bay and across Canada to the Pacific and Alaska. At the southern edge of its range, it occurs in scattered sites in Maine, New Hampshire, Minnesota, Montana, Idaho, and Washington. Genetic isolation is a concern in these subpopulations, and, although it has not been federally protected under the Endangered Species Act, the animal is listed as Threatened by several state wildlife agencies.

Want to find a bog lemming? It may be easier to catch a bird by salting its tail. Field naturalists describe *S. borealis* as "elusive," "isolated and local," and "seldom seen." Scientists studying a population on Mount Katahdin explored whether the lemmings suffered from limited habitat or were edged out by other small mammals. Neither proved to be the case, leaving them to wonder if the northern bog lemming is simply an example of "rarity, an important natural phenomenon."

To help in the search, bog specialists tell us to look for two tell-tale signs: "sedge stems clipped about an inch long and heaped like miniature log piles near their travel lanes" and "bright green droppings, often at special manuring spots, by-products of diets heavy in herbs." (While mostly herbivorous, bog lemmings will eat the occasional snail or slug that crosses their path.)

Like other northern species, *Synaptomys borealis* has several adaptations to the cold. Most noteworthy is the enlargement of its middle claws in the wintertime, thought to aid in digging through snow and frozen ground. Its long and loose pelage provides insulation. Northern bog lemmings also adapt to the onset of winter by giving up their surface runways for large networks of underground burrows. Remarkably, they neither hibernate nor show any signs of winter torpor, and may be found scuttling about day or night year-round.

The myth of the suicidal follower, trailing its neighbor over the edge, misrepresents these secretive creatures. But we may do well to keep alive the expression, "like a swarm of lemmings," in this era of *our own* ecological cliff rushing.

—**JOSHUA BROWN**

QUOTED SOURCES: Johnson, Charles W. 1985. Bogs of the Northeast. Hanover: UP of New England. Clough, Garrett C. and John J. Albright. 1987. Occurrence of the Northern Bog Lemming, *Synaptomys borealis*, in the Northeastern United States. Canadian Field-Naturalist 101(4) 611–613.

Pencil drawing by wildlife artist **Bob Ellis,** *an activist, naturalist, and "unabashed biophiliac" possessing keen observational skills. Bob is a longtime contributor to* Wild Earth *and a champion of preservation efforts in his own Millers River Watershed in western Massachusetts.*

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PHOTOS *Big Hatchets: Dave Foreman • jaguar, Mexican wolf: Oscar Moctezuma • thick-billed parrot: N. Snyder*

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