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WILDEARTH

Summer 1996

Arctic Refuge



4.95 US



Fish Wars
The White Ash
Caribou Commons
Alaska's Honker Divide
Great Old Broads for Wilderness

Around the Campfire



The United States of America is acknowledged as the world's leader in conservation. That leadership comes from our heritage of public lands conservation policy. National Parks, for example, are often considered America's greatest legacy.

During the first hundred years of the Republic, Congress's policy toward public lands was to get rid of them, either through individual homesteads or through giveaways to railroads, timber barons, and politically-connected land speculators. This began to change in 1872. After a heated debate, Congress set aside the headwaters of the Yellowstone and Snake Rivers as a "National Park." In deciding that Yellowstone should remain as the public's land for all time and not be handed over to private interests, Congress and President Ulysses S. Grant set a new course for the Republic. During the next century and a quarter, more than one hundred individual pieces of legislation have cobbled out a bipartisan American consensus on public lands conservation policy (see sidebar).

In today's conservation debate, we often forget three fundamental truths about the legislation that makes up our public lands conservation policy:

- The making of conservation policy has been *bipartisan*, with Republicans from Teddy Roosevelt to Representative Connie Morella (Maryland) working just as hard as Democrats to safeguard our public lands legacy.
- American public lands conservation policy represents a *democratic national consensus*. The legislation making up our conservation policy has come about after open and often lengthy public debate, not through under-the-table riders on bills.
- From the establishment of Yellowstone National Park in 1872 to the California Desert Protection Act in 1994, a heritage overflowing in *tradition and consistency* has been set. (Someone might want to tell freshman Republicans in the House that respect for one's heritage is a bedrock conservative principle.)

Of course, we conservationists have not always won. More land in the lower 48 is under pavement than protected as Wilderness. During the last 25 years, the Forest Service alone has destroyed an average of one million acres of de facto wilderness a year through logging and road-building. More species every year teeter on the edge of extinction. The brass of federal land agencies have too often slipped into bed with the Diamond Jims of extractive industry. But despite the disappointments and the frequent sapping of conservation law, the public lands have remained the public's land. Concerned citizens have kept a strong voice—though too often drowned out by the clatter of silver dollars—in public land management.

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White Ash illustration by Heather K. Lenz

Cover art: Polar Bear and Cubs by Darren Burkey

But due to the 1994 Republican take-over of Congress, our public lands conservation heritage is as endangered as the Mexican Wolf. Show-cased in individual bills or hidden in riders in appropriations legislation, the radical gang in charge of Congress has proposed that conservation laws be suspended to allow "salvage" logging in the National Forests, that private livestock grazing become the dominant use on public lands, that billions of dollars worth of federal minerals continue to be given away to corporations, that the Endangered Species Act be effectively repealed, that the coastal plain of the Arctic National Wildlife Refuge be turned into a private oil field, that Alaska's Tongass National Forest be managed to produce logging jobs, that some National Parks be closed, that the public lands be handed over to the states or to private ownership, that Wilderness Areas be downgraded and the Wilderness Act shredded....

I'll stop here with this litany of horrors—with which readers of *Wild Earth* are all too familiar. Except for the terrible Logging Without Laws rider, which suspends conservation law to *save* our last old-growth stands, none of these bills has become law—thanks only to the valiant work of conservationists. But all these bills remain serious threats—especially if the anti-conservation crowd retains control of Congress and takes the presidency this fall.

Lost in the dust of these various attacks on the public lands is their underlying unity. Don't think for a moment that this clutter of bills and riders is a cacophony. It is a symphony played by an orchestra in tune—a carefully-thought-out, coordinated assault on America's hundred-year-old bipartisan public lands conservation policy.

We are also facing a different band of yahoos than we did in previous battles such as the so-called Sagebrush Rebellion. Not only are the standard bunch of bankers, loggers,

The keystones of Our Public Lands Conservation Policy

Because our public lands are federal land, national conservation policy has been built upon congressional acts or presidential orders:

- 1872. Yellowstone National Park established.
- 1890. Following John Muir's tireless and eloquent promotion, Congress establishes Yosemite National Park, thereby showing that Yellowstone was not a unique event.
- 1891. Congress authorizes the President to withdraw land from the previously to-be-disposed-of public domain to create "forest reserves." President Benjamin Harrison immediately withdraws 13 million acres in the West.
- 1897. Congress passes the Forest Management Act—the basic legislation for the National Forest System—leaving no doubt that the United States has embarked on a new policy of retaining public lands and of setting guidelines for their long-term management and protection.
- 1903. President Theodore Roosevelt designates Pelican Island in Florida as the first National Wildlife Refuge.
- 1911. The Weeks Act authorizes the *re-creation* of public land. The Forest Service can now purchase private land to make National Forests in the eastern United States, where no public land remains.
- 1916. Congress passes the National Parks Act, establishing National Parks as a system and setting policy for their management.
- 1964. After an eight year debate, Congress passes the Wilderness Act, establishing a National Wilderness Preservation System of wildlands in the National Forest, National Park, and National Wildlife Refuge systems.
- 1968. The National Wild & Scenic Rivers Act is passed, establishing a national system of rivers protected from dams and channelization.
- 1969. President Richard Nixon signs the National Environmental Policy Act, requiring federal agencies to study the ecological impacts of proposed actions.
- 1973. Congress passes the Endangered Species Act and sets a national policy that we will not cause the extinction of any species.
- 1976. If there has been any lingering doubt about the national commitment to keep a vast heritage of public lands for all Americans, it is laid to rest with the Federal Lands Policy and Management Act (FLPMA). Hundreds of millions of acres of public land, not yet withdrawn for National Forests, National Parks, or National Wildlife Refuges, now are to be retained in federal ownership under the Bureau of Land Management. The BLM is ordered to study these lands for possible designations as Wilderness Areas. Like the Wilderness Act a decade earlier, FLPMA is the product of long discussion and many public hearings in the western United States.
- 1980. Congress passes the Alaska National Interest Lands Conservation Act. Following years of debate and hearings in which thousands of American citizens spoke out, more than 100 million acres of Alaskan public lands are established as new National Parks, Wildlife Refuges, Wilderness Areas, and Wild & Scenic Rivers.

Beside these landmark laws stand dozens of other acts of Congress establishing National Parks and Wilderness Areas.

ranchers, miners, and dirt bikers better organized and privy to slick PR help now, but they have been joined by the wackos of American politics. Since colonial days, a nativist, anti-intellectual, paranoid, and gullible underground has skidded along the outer edge of public debate. Popping up as the Know-Nothings, riding the night in sheets as the Ku Klux Klan, or as the John Birch Society, fearing Dwight Eisenhower as a Communist agent, these violent, home-grown radicals have today resurfaced as the "militia" and are coiled throughout the "Wise" Use Movement. Given voice by Representative Helen Chenoweth (R-Idaho), Rush Limbaugh, and Pat Buchanan, the disparate factions of the nutty right are united in the modern attack on America's public lands heritage.

Part of the reason that the anti-public lands crowd has become so powerful is that we conservationists have assumed that the national debates about Wilderness Areas, National Parks, public lands, and Endangered species have been won. Yet, bankrolled by corporations, playing on the fears of rural Americans, appealing to anti-government sentiment, and telling lies about the Endangered Species Act and public lands "lockups," our enemies have created a nasty debate about our public lands heritage.

Conservation groups must jump back into the debate with basic public education about the value of public lands, the importance of Wilderness Areas, and the truth about the ESA. We need to hone our message about our public lands heritage and tell it to the nation.

Our enemies have also learned well from our organizing manual and have done a crackerjack job of turning people out. We must make our activist voice better heard.

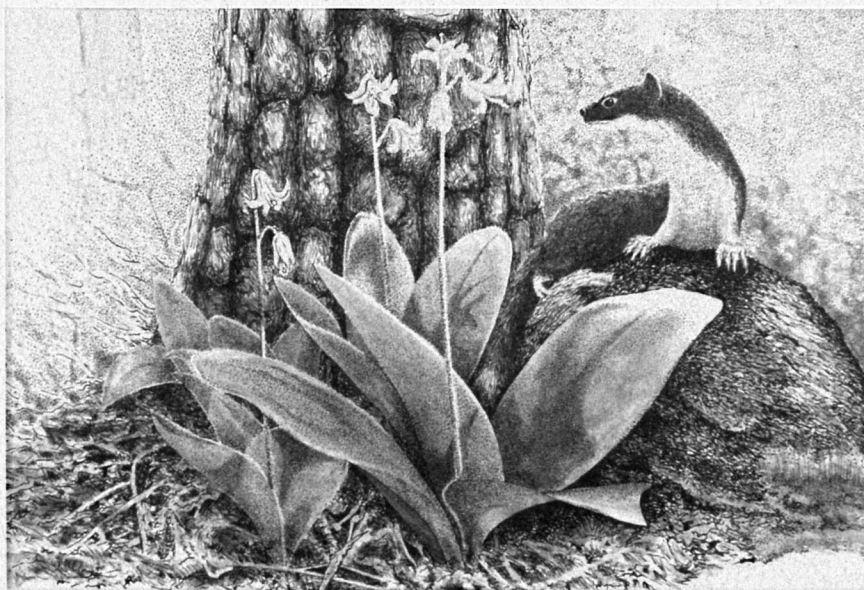
We must recognize, though, that typical conservation groups like the Sierra Club or Northwest Ecosystem Alliance aren't always the most effective advocates for public lands. In these cases we need to reach out to our allies—and some of these allies you might not expect:

- Hunters and fishers. The hook-and-bullet crowd is up in arms. Hunting magazines are loading their editorial thirty-ought-sixes against the raid on public lands. The generally well-to-do and generally Republican members of Trout Unlimited have come out strong against logging and grazing that destroy trout streams.
- Evangelical Christians. The Evangelical Environmental Network may be the ultimate savior of the Endangered Species Act. These Bible-believing Christians see the ESA as "the Noah's Ark of our day" and are taking their message of love and responsibility for Creation to Congress.
- Budget Hawks. Tension is growing between true conservatives and supporters of corporate subsidies. The Sierra Club and other conservation groups have joined with the Cato Institute, Heritage Foundation, Competitive Enterprise Institute, and Taxpayers for Common Sense Foundation to oppose Senator Pete Domenici's (R-New Mexico) bill to

hand the public lands over to ranchers. Other budget hawks are going after the subsidies that allow mining, logging, and energy corporations to trash our public lands. The Green Scissors Report, a joint effort of conservation and budget groups, identifies billions of dollars of Nature and health threatening projects and subsidies that could be cut from the federal budget.

But make no mistake. Even with these allies, we conservationists are in the fight of our life. We're in the fight *for* life. We are seeing what could be the last Great Barbecue where boardroom fat cats and their congressional golf buddies rip off our public land heritage. To let our land—in all its wildness, abundance, beauty, and integrity—be taken away from us would be as radical and un-American as shredding the Bill of Rights. You are the main line of defense.

Happy Trails,
—Dave Foreman
McKenna Park



Ermine and Corn Lily, *watercolor by Bob Ellis*

The Wildlands Project *UPDATE*

by Steve Gatewood

A NEW DAY dawns warm and humid. Heavy dew covers the ground and drips from spider webs hung between stiff, green palmetto fronds. As a covey of Bobwhite Quail rustles through the lush ground cover of wildflowers, Sandhill Cranes move their young chicks with loud, boisterous calls through the dense grass of a wet prairie. I look out past the scorched trunks of an open Longleaf Pine flatwoods to the dense hardwood swamp forest beyond, scanning the ecotone for evidence of Bobcat or Gray Fox on the prowl.

Another morning starts clear and cool. Dry, crisp air carries the sound of Cactus Wrens and Gambel's Quail to my ears. A Gila Woodpecker darts into a cavity in the local "tree," a Saguaro cactus. The wind picks up and dust begins to swirl around rocky hills and peaks. Low rainfall has kept many of the sparse desert plants from producing the profusion of spring flowers that a wet winter would bring, yet the prospect of new life is evidenced by a mother Coyote with her pups moving among greasewood and mesquite.

These scenes, only two weeks apart but in seemingly different worlds separated by thousands of miles, illustrate how things can change and remain the same. I experienced both of them moving from project director of the Disney Wilderness Preserve for The Nature Conservancy in central Florida, to executive director of The Wildlands Project in southern Arizona. I am changing jobs, yet doing essentially the same thing—leading great projects dedicated to protecting biodiversity. The natural environment still has quail, predators, and diverse native plant communities, yet distinctly different species, topography, climate, and structure. And no matter where, life goes on.

And so it is with The Wildlands Project. We are undergoing very significant change, yet things remain the same.

David Johns, Barb Wolman (our business manager), and board members Bill Devall, Rodolfo Dirzo, Reed Noss, Jamie Sayen, and Terry Tempest Williams have moved on.* Hillary Oppmann (our new business manager) and I move into new staff positions, and Yuri Blanco, Al McDonell, Oscar Sanchez and John Terborgh are coming onto the board. Yet the mission remains the same: To help protect and restore the ecological richness and native biodiversity of North America through the establishment of a connected system of reserves. And the project goes on.

David graciously thanked all of you for assistance over the years in his last TWP Update. We must extend our deepest appreciation and thanks to David and Barb for the years of service provided to this organization, to our cause, and to the wild we work to protect. The same appreciation and thanks go to Bill, Rodolfo, Reed, Jamie and Terry for their tenure as board members. All should feel proud and, as David wrote in the last issue, "know what the best reward is for their contributions: the howl of a wolf, the sight of a wild salmon, the thump of a Bison's hoof, the glimpse of a cat disappearing into the bush." We welcome our new board members, Yuri, Al, Oscar, and John, and challenge them to help us change The Wildlands Project into a better and stronger organization that remains true to the same mission.

Since the winter issue of *WE* was devoted to Wildlands work, I'll hold a specific program update until the fall issue. We will continue the good work initiated under David's leadership: May board meeting, hire a staff ecologist, coordinate pilot regions, raise funds, and start new initiatives and programs. But as with the natural world we work to protect, the only certainty is that things will change. And our work will go on. ■



* Editor's note: In new capacities, however, remain most of those leaving formal roles with the Project. —JD

Text, Civility, Conservation, and Community

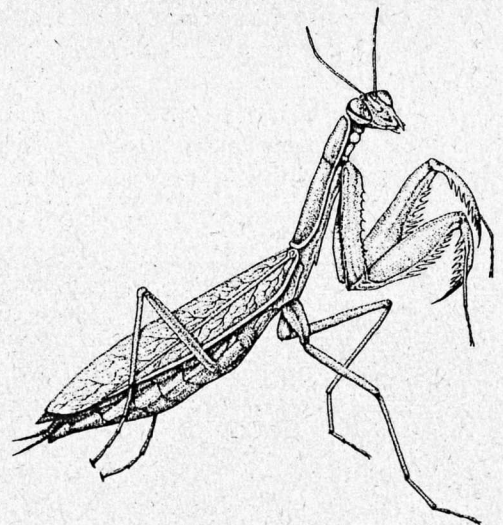
On Nature Writing and Common Ground

by Bill McKibben

One day last fall, as I staggered back to the house under a typical load of mail, I realized something. I wasn't a Columbus-on-a-solo-voyage writer—I was a small part of a larger school. The day's haul included my new issue of *Wild Earth*, with fragments of Rick Bass's essays on Grizzly Bears. There was a fundraising appeal from the Southern Utah Wilderness Alliance with a typically passionate sermon from Terry Tempest Williams. Alan Durning, from Northwest Environment Watch, forwarded a new report on the impact of automobiles on Washington and Oregon. A publisher had sent me galleys of David Abram's stunning new book, *The Spell of the Sensuous*, which uses Heidegger, Hebrew, and Hopi legend to reconnect readers to the natural world. Some of these people are friends; all are in some sense colleagues. Though raised on the notion that writers are supposed to be ego-driven loners, hacking a path through the jungle in search of solitary truth, I found myself remarkably pleased at the thought that I was one voice among a choir.

The mailbox is stuffed like this nearly every morning. The broad school of nature and environmental writing gains more depth and power and coherence with each passing year, even as the natural world it describes and extols comes under a darker cloud. This school stretches the enormous distance from the poetry of Gary Snyder or W.S. Merwin or Mary Oliver to the computer-modeled calculations of people like Lester Brown. In between are hundreds of nature essayists, naturalists, explorers, story writers, and theologians. We're completely unorganized, without a trade association or even a few shared cafés or barrooms to ground our work. Still, the members of this movement seem to me to be coming to common, and deeply countercultural, conclusions—a set of understandings that, though contrary to the spirit of the moment, may well help shape our society as it moves into an age dominated by environmental trouble.

Key to understanding this set of conclusions is a simple observation: this literary school is strangely non-competitive. Most schools of writing have been at least as famed for their spats and jealousies as for their agreements. Inside this world, however, even people whose temperaments and emphases are poles apart work more through accretion than dialect, examining texts for what they can agree with, not what they can argue over. One would have expected Edward Abbey, the cantankerous desert Thoreau deeply devoted to wilderness, to nature as opposed to man, to be contemptuous of Wendell Berry, the Kentucky farmer-essayist whose gentle but stern accounts emphasize our responsibility to the land and each other. In fact these two great writers of our time did write frankly about each other's work, with Abbey questioning whether stewardship is the right goal, and whether people are capable of it. They wrote frankly—but carefully, too, always noting their many points of agreement. "His work is an indispensable source of delight, instruction, and



When you're clear about what really counts, you tend to look for points of agreement with others, not slivers of difference.

comfort to me," wrote Berry. "He is the best serious essayist now at work in America," Abbey replied. And those who read both of them are forging a new land ethic from their work, one that is comfortable both with the howling of the wolf and the lowing of the cow.

Some of this peacefulness is structural. Nature writing is one of the very few literatures that exists mostly outside the academy, and so its practitioners are not reflexively critical. There's not much money in it, and blessedly few prizes. In any event, almost every nature writer is simultaneously an activist, engaged in local or national struggles to save this patch of forest or that shred of environmental legislation. Gary Nabhan is one of the great lyrical naturalists of the Southwest, but what he usually wants to talk about is the "Forgotten Pollinators" campaign he's helping run on behalf of desert bats and bees. Rick Bass is the author of *The Ninemile Wolves* and half a dozen other classic books—but he also writes an endless stream of mimeographed letters trying to drum up Congressional support for his beloved Yaak Valley in Montana. I met Merwin not at some poetry workshop but because he was helping lead the fight for one of the last tropical rainforests in America in his home state of Hawaii. When you're clear about what really counts, you tend to look for points of agreement with others, not slivers of difference.

But there's something deeper going on here. Those points of agreement include a powerful idea that inclines nature writers toward becoming members of a school. This central insight is simple enough: we human beings are not at the absolute center of the world—not as individuals and not even as a species. Though much of our environmental work is driven by a desire to better peoples' lives, many of us, to one extent or another, have

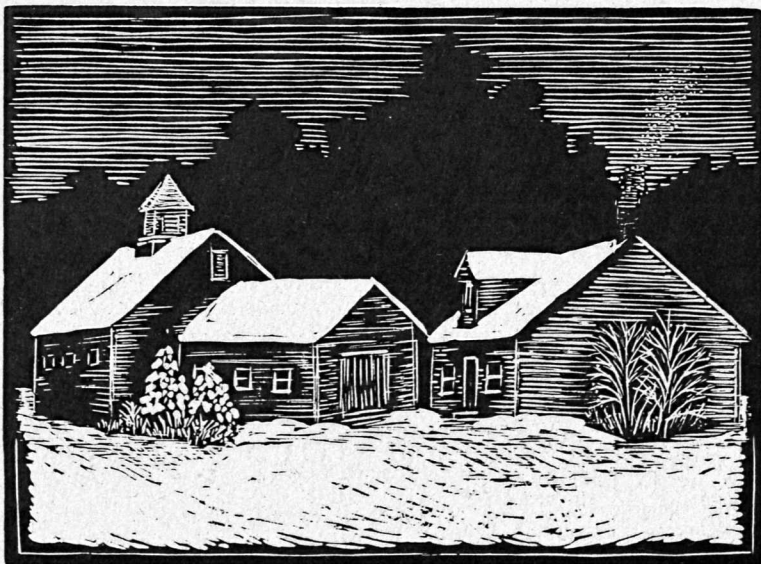
come to realize that the emphasis of the consumer society on endless individualism is unhealthy—spiritually and ecologically. Nature writers, almost by definition, are people who spend some nights out underneath the stars. And when you're under the stars you feel small. Not in a bad and demeaning way, but in a nearly joyous way—you're a small part of something big and mysterious and somehow orderly. Unlike most people in this culture (unlike especially most academics) nature writers spend time in the company of animals and trees, the company of other life. It is no wonder that their writing, the writing of this entire school, tends away from the peacockery of so much of American letters. The Hemingway-Mailer cult of egocentrism makes little sense when you see the world this way. Our secret is that the world is bigger than we used to think, which leads naturally to a kind of modesty.

In an elementary way, then, this movement of writers and ecologists is modeling the world it imagines, starting to prove it's possible. Generosity, modesty, a certain amount of self-abnegation, a pleasure in the insights and accomplishments of others—those are the hallmarks both of the society we need to build, and of the literary movement that we're already constructing.

I still wake up some mornings wishing someone would give me a prize—the Pulitzer, say. I'm not all the way into this new world, and I never will be. But perhaps I'm a little closer all the time. In one of the first examples of what might be called ecological criticism, Wendell Berry wrote a magnificent essay a few years ago about *Huckleberry Finn*, that book Hemingway said famously was the wellspring for all American letters. Berry agreed that of course it was the classic American tale, that Tom stood for the whole country when in his brash youth he lit out for the territories. The weakness in Twain's tale,

he thought, came right at the end, when Tom decides *never* to go home and be 'civilized, never to build the good community but always and eternally to continue his footloose, individualistic romp. Berry is right, I think—it's time for us to mature as a society and a world. And now we have the chance for a new idea of ourselves, and with it a chance to build that new community. What I *really* want is for Wendell Berry to win the Pulitzer, and put it somewhere in his barn, and then I'd like the Pulitzer to go away forever so we can push on together with the real work. ■

Bill McKibben is one of Earth's foremost environmental journalists. His books include The End of Nature, The Comforting Whirlwind, and most recently Hope, Human and Wild (reviewed in this issue).



BARN, wood engraving by Suzanne DeJohn

Commentary on Eastside Forest Restoration

Questioning the Manipulative Approach

I think Mark Gaffney's piece on Eastside Forest Restoration in the fall 1995 *Wild Earth* needs some qualification. While I agree with his interpretation of the events that have led to the change in eastside forests, I believe his prescription on how to fix them is dangerous and short-sighted. It suffers from a lack of vision as well as of an appreciation of scale—both on a temporal and spatial level.

Mark's analysis and review of forest stand invasion and changes in fuel loading due to fire suppression are accurate. Tree species like fir that are less drought resistant than pine have matured and created fire ladders that result in more intense crown fires in areas where previously low intensity, "cool" fires predominated. However, I don't agree that we need to do something to fix this.

One of the problems here, as with many issues of natural resource management, concerns academic training. Most of the research on forests and fires has been done by foresters and forest ecologists—

most of whom are trained in forestry schools which are immersed in the "management" tradition. This tradition believes that humans can rationally manipulate any natural resource, whether it is forests, rangelands or wildlife. It is not surprising that people trained to manipulate forests would conclude that further manipulation is necessary to cure what is perceived as a problem in our forests.

It's not that these people intend to mislead the public. And I don't want to imply that they are merely puppets of the timber industry. They are not. But they still come from a tradition that tends to view natural forests as somehow less than perfect, and therefore open to improvement by human manipulation.

Beyond the problem of citing sources that suffer from the management paradigm, there are several points in Mark's analysis that I take issue to: 1) that there is a cri-

sis in our forests, 2) that we can correct this by manipulation of the forest, and 3) that what we are seeing is unusual. Let me address each in order.

First, the idea that we have a forest health crisis is more imaginary than real. True, trees are dying in record numbers due to disease, drought, and other ailments. True, forest fires are larger and more intense than in the recent past. But that doesn't mean forest ecosystems are "unhealthy." There's a difference between the welfare of individual trees or even groups of trees and the forest ecosystem as a whole. The ecosystem is fine. It's doing exactly what it should be doing given the current situation—thin back the forest by eliminating trees like fir that are not well adapted to current environmental conditions and favoring trees like ponderosa pine that better tolerate drought and other natural environmental parameters in the West. If we wait long enough, we will once again see old growth ponderosa pine at low elevations—unless we continue to cut them.

Mark says fires historically burned with relatively high frequency through low elevation eastside forests. That's true if you look at things from a several hundred year perspective. Yet few areas of the Blue Mountains in eastern Oregon, for example, have trees more than a couple hundred years old. That's because during the Little Ice Age of 1400-1500, better conditions reduced fire frequency, permitting fuels to grow just as we see now with fire suppression. After drier times returned in the 1700-1800s, massive fires burned across much of this region, setting the stage for a return to smaller, low intensity fires. Although the current reduction in fire frequency was human-caused, the mechanism for correcting this still exists in the forest ecosystem. It is called a crown fire.

My point is that crown fires are not unnatural if you view things from a long enough temporal scale. One of the problems with most fire history reconstruction is that the studies generally only go back to the last major fire—several hundred years at most in many parts of the West—because the previous series of large fires destroyed all the trees, leaving none to survive and produce scars.

Our forests can tolerate such large intense fires, for a variety of reasons I won't go into; here suffice it to say that over a large spatial scale, fires burn in a mosaic—even crown fires. Not all the old growth ponderosa pine

What is the worst thing that will happen if we don't thin and otherwise manipulate forests? We'll have big crown fires. And I maintain that our forest ecosystems are resistant enough to survive these big fires.

will burn up if we permit fires to burn through them. If we permit fires to return to a more natural frequency—i.e., we don't continue fire suppression policies—then once these areas are cleared of fuels, in most areas we will get a return to the kinds of forests that once dominated this area prior to widespread human intervention.

Beyond that, focusing on fuels misses another important aspect of fire ecology. Most large fires are controlled by weather conditions as much as by fuels. And the occasional large fire, more than numerous small fires, is what controls the appearance and species composition of our forests. Just as the 100-500 year floods are what control river channel morphology, not the average yearly spring floods. The low intensity fires recorded in fire scar histories are like the annual spring floods. Though ecologically important, they are not what shapes the system.

Under certain weather conditions, we get large fires, even in the areas where low intensity fires were the norm. Indeed, in recent dry years forest fires burned through clearcuts, young tree plantations, and thinned forests. There is even evidence to suggest that fires burn with greater intensity in open, lightly stocked stands because these places dry out more readily than heavily stocked, dense stands.

In addition, the manipulation of forest ecosystems that Mark and many foresters suggest we need to do, such as thinning out young trees and eliminating ladder fuels, can't be done on any kind of scale that will make an appreciable difference in fire intensity and burns. We would have to treat hundreds of millions of acres to make a genuine difference in our forests. Even if we could afford to do this, we couldn't without disrupting many other features of the forests, from soils to insects. So "restoration thinning" is a waste of time and effort, except as a means of protecting individual sites such as towns from the inevitable large fires that *will* burn across the West regardless of what we do—short of cutting down all the forests.

We need to ask ourselves what is the worst thing that will happen if we don't thin and otherwise manipulate forests. We'll have big crown fires. And I maintain that our forest ecosystems are resistant enough to survive these big fires.

Finally, the idea that we can do prescribed burns to reintroduce fires needs some careful examination. I'm not opposed to prescribed burns, but most agencies only do such burns when conditions for a burn are marginal. Thus prescribed fires don't burn much land, and don't effect forest ecosystems significantly. We need to reintroduce widespread fires under the very conditions that create large fires. Small fires are no ecological substitute for periodic large fires which may have occurred only once every few hundred years. ■

—George Wuerthner, Box 3975, Eugene, OR 97403

Reiterating the Need for Active Restoration

George Wuerthner writes often and well about grazing issues. But the same cannot be said of his commentary on eastside forest restoration.

Before I rebut his letter I want it known, for the record, that I have no connection with academic forestry. I do acknowledge that, once upon a time, back in the naivete of youth, I did dream of becoming a forest ranger. In 1966 I even enrolled as an undergraduate at Colorado State University's forestry college. However, a few short months of classes were enough to remove the scales from my eyes, whereupon I switched to zoology, and never looked back. Also for the record: of twelve sources cited in my fall 1995 *WE* article "Eastside Forest Restoration," all but three were drawn from *within* the environmental community. So Wuerthner's comment that I rely too heavily on "people who view natural forests as imperfect" has scant basis. Furthermore, it isn't research by mainstream foresters alone that supports the need for restoration. Ongoing research by wildlife biologists also supports it.

With luck, the flaws in Wuerthner's comments will serve to advance the debate about restoration in a positive direction. Wuerthner concedes the trend is toward large intense crown fires, but says that ponderosa forests will ultimately recover in any case, "if we wait long enough." What Wuerthner fails to recognize—and this is crucial—is that this same argument could also be used to justify clear cut logging, or any other exploitative practice, however destructive. Given enough time, almost any form of land-rape will heal. But does this justify such practices? Of course not.

The reason is because too much is at stake in the meantime. Which is why the answer Wuerthner gives to the question "what is the worst thing that will happen..." rests on shaky ground. With only 5-10% of eastside old growth still standing, we can ill-afford to lose ANY of it, whether through liquidation logging OR crown fires. Wuerthner's claims that crown fires are natural is beside the point. Whatever the long term prospects for ponderosa pine itself, old-growth dependent species like the goshawk, the white-headed woodpecker, and the bald eagle have nowhere else to go in the meanwhile, should any significant portion of their remaining habitat be lost.

Mature ponderosa pine is an extremely tough and drought resis-

Mature ponderosa pine is an extremely tough and drought resistant species, given a regime of frequent low intensity fire. Remove cool fire, however, and the same plant community begins to unravel. At issue then is how to reintroduce fire to the system.

Do Eastside Forests Need Restoration, or Crown Fires?

tant species, given a regime of frequent low intensity fire. Remove cool fire, however, and the same plant community begins to unravel. At issue then is how to reintroduce fire to the system.

The point of my article is that on most eastside sites it cannot be accomplished without first removing the small diameter trees (less than 20 inches DBH) that have become established during the interim period of suppression. Given a natural fire regime, these small trees would have been removed, in any case. Removing them manually, and then running cool ground fire through the stands to consume accumulated surface fuels, should reset the biological clock to approximately the moment when suppression commenced. Such an approach maintains the standing forest (critical habitat), while making it feasible to allow future wild fire to burn unfettered, once again. I believe this is the preferred path to the wild, insofar as ponderosa pine forests are concerned.

Wuerthner is correct on one important point: the spatial dimension of the problem. In a word, it's enormous. Tens of millions of acres (if not, as he says, hundreds of millions) currently stand in need of restoration work. And every year of inaction the magnitude of the problem grows.

Daunting as the challenge is, I don't agree that it's hopeless. The problem, after all, lies not with Nature. On this we agree. Nature is dispassionate, beyond moral judgments of good and bad. Nature is just doing her thing.

The real problem lies with our endless human capacity for self-deception, whether the result of greed or self-righteousness. The point is that human action brought about the problem. And, if we can come together, human action could set it right again. My argument is simply that we have the responsibility to do so, even if this means setting aside our personal distaste for logging. ■

—Mark Gaffney, 9620 Sprague River Rd., Chiloquin, OR 97624

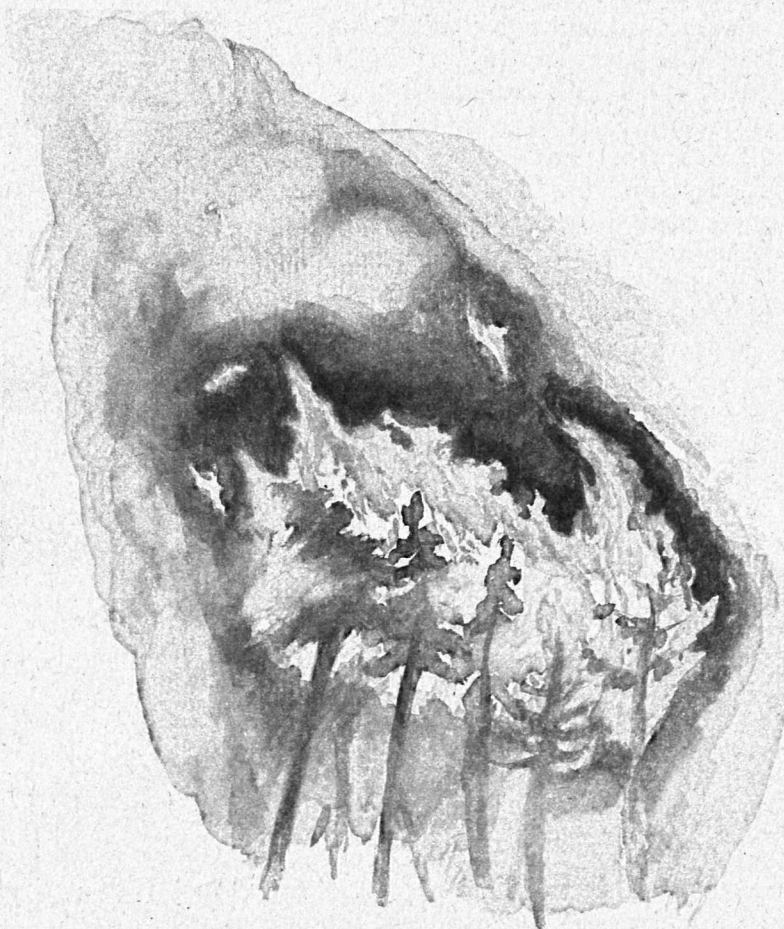
I have to disagree with George Wuerthner's statements about fire ecology and restoration forestry. My views are much closer to those expressed by Mark Gaffney in his article. I must confess I am no authority on Ponderosa Pine or the vegetation of the Eastside generally, though I have read the scientific literature on the topic rather thoroughly and have observed many stands in the field. My interest in and love for Ponderosa Pine stems largely from my much greater familiarity with a forest community I consider ecologically analogous: the Longleaf Pine of the southeastern US coastal plain. Both forest types are characteristically open-canopied ("park-like") and have a dense herbaceous cover dominated by bunchgrasses and maintained by frequent, low-intensity ground fires. The needles of both pine species are highly flammable, hence, these pines are thought to promote fire as a way to out-compete more fire-sensitive plant species. It is now well accepted that the dependence of certain species on frequent fire is a consequence of evolutionary adaptations that enable them to tolerate fire better than their competitors. If fire frequency is reduced, the competing, fire-sensitive species invade and eventually dominate the stand. The fire ecology of Longleaf Pine has been better studied than that of Ponderosa Pine (but see the work of Jim Habeck and others¹), but if they are truly analogues, we ought to be able to learn something about managing Ponderosa Pine from the extensive experience with Longleaf. Of course, no analogy is perfect, and there are important ecological differences between these two great forest ecosystems; there is also much variability among the many plant associations that are lumped together within each class. But what is known about the fire ecology of both systems, and is especially well documented for Longleaf Pine, vindicates Mark and suggests that several of George's statements are incorrect.

George urges a long-term view and suggests that the fire suppression of the last several decades was simply a telescoped version of what happened during the wetter, cooler times of the Little Ice

Age, when Ponderosa Pine supposedly gave way to mixed conifer forests. The vegetation history of the Eastside (and of the Intermountain West generally) is not well established by pollen analysis or other methods, but the information available suggests Ponderosa Pine has been around a long time, though undoubtedly fluctuating in abun-

Ponderosa Pine...is one of the most endangered major forest types in North America. We know that it and many other species in the community require frequent, low-intensity ground fires and that old-growth trees can be killed in the crown fires that occur after many years of fire suppression.

...low-intensity fire in these systems is a necessity; it doesn't set back succession, it maintains a dysclimax condition indefinitely, until climate changes or humans suppress fire.



dance with trends in climate². In the rangelands of the region, it appears that wetter, cooler periods led to increased fire frequency—the opposite of what happens in many forest communities—due to the development of a dense herbaceous layer (fine fuels). For example, pollen analysis has shown that sagebrush and grass cover alternated in frequency with climatic variation, with grass increasing in cool, wet periods and sagebrush increasing in dry periods. Ponderosa Pine communities, in most situations, are more savannas or woodlands than true forest and they intergrade with sagebrush/bunchgrass communities and have a bunchgrass-dominated herbaceous layer. Thus, it is likely that some stands, at least, burned more frequently during the Little Ice Age. In the southeastern US, pollen analysis shows fluctuating periods of oak and pine dominance over the last 40,000 years; Longleaf Pine was the dominant vegetation for the last 5000 years until drastically reduced by logging and fire suppression over the last century. Similarly, Ponderosa Pine has an ancient history (see footnote 2) and, contrary to George's assertion that there are few areas in the Blue Mountains with trees over 200 years old, until recent logging there were many old-growth stands with trees commonly 400 to 500 years old³. It is not known how much of the fire that maintained Ponderosa Pine in recent centuries was set by native Americans, but these people would have been another factor favoring Ponderosa Pine.

The major gripe I have with George's comments is his assertion that low-intensity fires are not as important ecologically as crown fires. This statement disregards that low-intensity fire was the primary ecological factor that maintained two of the largest forest formations in North America—Longleaf Pine and Ponderosa Pine—as well as many other grassland, barren, and savanna communities⁴. Frequent, low-intensity fires are so integral to the evolution and ecology of the species in these ecosystems that calling such fire a disturbance is misleading. Rather, low-intensity fire in these systems is a necessity; it doesn't set back succession, it maintains a dysclimax condition indefinitely, until climate changes or humans suppress fire. On the other hand, a crown fire in these ecosystems most definitely is a disturbance, and one to which the dominant species in the present community are not particularly well adapted. It could also be said that lack of fire in these ecosystems is a disturbance or, more accurately, a stress. The community that develops through succession after fire suppression followed by high-intensity fire is not predictable; contrary to George's suggestion, it may not be similar to what was there before. We certainly can't count on getting park-like Ponderosa Pine back. Because Ponderosa Pine,

illustration by Eva-Lena Rehnmark

Longleaf Pine, and many other communities dependent on frequent fire are now endangered ecosystems⁵, it seems wise to protect them in places where they are of high quality and to restore them in places where they are degraded. In the case of Longleaf Pine, we know that dozens of species decline or are lost from stands that are fire suppressed; the endangered Red-cockaded Woodpecker, for example, abandons stands when the midstory canopy begins to close. Although not documented in the scientific literature as well as it should be, midstory thinning and prescribed fire have proven very useful in restoring Longleaf Pine communities.⁶ Again, the research to verify these kinds of species losses and restoration approaches has not been conducted in Ponderosa Pine communities, but we can expect similar responses. And contrary to George's implication, several species—among them White-headed Woodpecker, Flammulated Owl, and Pygmy Nuthatch—are probably dependent on open-canopied Ponderosa Pine stands. Very likely, dozens more remain to be documented.

Ponderosa Pine, despite its huge geographical distribution, is one of the most endangered major forest types in North America. We know that it and many other species in the community require frequent, low-intensity ground fires and that old-growth trees can be killed in the crown fires that occur after many years of fire suppression. Manual cutting of the small stems ("thinning from below") that have invaded after fire suppression, followed by prescribed burning, is a promising restoration strategy. There is no fundamental reason why this restoration cannot be carried out over a large geographical area; with rising prices of pulpwood, it should be able to pay for itself in many cases. This does not mean that we should thin and burn every stand. Many stands can probably be restored with burning only, and in some cases a crown fire would be the best thing that could happen. As I've written elsewhere⁷, I favor an experimental approach to restoration of Eastside forests, which would include several treatments:

1. Control areas with no management (wildfires would be allowed to burn).
2. No management except fire suppression.
3. No management except prescribed burning (various treatments).
4. Light thinning of small (e.g., <11 inches dbh) live and dead trees that have invaded since fire suppression, followed by periodic prescribed burning that emulates the natural fire regime (several treatments possible). Thinned trees could be left in place or removed, depending on fuel loads and pulp or fuelwood market.
5. Salvage of dead trees in various amounts, proportions, and size classes (several different treatments), but with live trees untouched. Salvage would be followed by prescribed burning on a regular basis.
6. Thinning of small live trees, plus salvage of dead trees in various amounts, proportions, and size classes (several different treatments, including prescribed burning combinations).

It is essential that all treatments be properly replicated and controlled. A cautious approach would emphasize the less intrusive treatments (#1-4), but because of the precarious status of Ponderosa Pine communities, I would favor applying treatments 3 and 4 over the largest area. As I wrote previously (footnote 7), "those few natural and near-natural stands that remain in relatively good health should be completely protected, as they provide the benchmarks, blueprints, and ingredients for restoration of degraded areas. Intrusive treatments should be confined to accessible stands, avoid roadless areas, and harm no mature or old-growth trees." Tragically, what we now see the Forest Service, urged by Congress, doing is abandoning caution and going full steam ahead with salvage sales that include logging of healthy old-growth trees. Conservationists must make clear that such "salvage" sales in no way constitute restoration forestry; at the same time, we should not shun legitimate restoration proposals that include silvicultural treatments (thinning from below) in addition to prescribed burning. Although we biocentrists may not like to acknowledge it, the future of many endangered ecosystems worldwide depends on active restoration and management. The alternative is to lose these marvelous natural communities and some of the species associated with them. ■

—Reed F. Noss, *editor of Conservation Biology and science editor of Wild Earth*

Endnotes

- ¹ A good place to start would be Habeck, J.R. 1990. Old-growth ponderosa pine-western larch forests in western Montana: ecology and management. *Northwest Environmental Journal* 6:271-292. This is an authoritative paper, and many important references on fire ecology are cited. Habeck concludes that the pre-settlement fire mosaic at elevations of 900-1500m "featured open, park-like ponderosa pine stands, with western larch and Douglas-fir as common associates, maintained by frequent, low intensity fires."
- ² See Peet, R.K. 1988. Forests of the Rocky Mountains. Pages 63-101 in M.G. Barbour and W.D. Billings, eds. *North American terrestrial vegetation*. Cambridge University Press, Cambridge, UK; and Delcourt, P.A., and H.R. Delcourt 1993. Paleoclimates, paleovegetation, and paleofloras during the Late Quaternary. Pages 71-94 in N.R. Morin, ed. *Flora of North America north of Mexico*. Oxford University Press, Oxford, UK.
- ³ Arno, S.F. and R.P. Hammerly. 1977. *Northwest trees*. The Mountaineers, Seattle, WA. For locations of sites in Oregon with remaining old-growth Ponderosa Pine, see Wood, W. 1991. A walking guide to Oregon's ancient forest. Oregon Natural Resources Council, Portland, OR. For an overview of old-growth declines and management needs in the region, see Henjum, M.G. J.R. Karr, D.L. Bottom, D.A. Perry, J.C. Bednarz, S.G. Wright, S.A. Beckwith, and E. Beckwith. 1994. Interim protection for late successional forest, fisheries, and watersheds: national forests east of the Cascade Crest, Oregon and Washington. Wildlife Society, Bethesda, WA.
- ⁴ For an overview of the state of knowledge on the fire ecology of Longleaf Pine, see the various papers in Hermann, S.M., ed. 1993. *The longleaf pine ecosystem: ecology, restoration, and management*. Proceedings of the 18th Tall Timbers Fire Ecology Conference, Tallahassee, FL.
- ⁵ Noss, R.F., E.T. LaRoe III, and J.M. Scott. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. *Biological Report 28*. USDI National Biological Service, Washington, DC. Noss, R.F., and R.L. Peters. 1995. *Endangered ecosystems: a status report on America's vanishing habitat and wildlife*. Defenders of Wildlife, Washington, DC.
- ⁶ See footnote 4 and USDA Forest Service. 1995. FEIS for the management of the red-cockaded woodpecker and its habitat on national forests in the Southern Region. Atlanta, GA.
- ⁷ Noss, R.F. 1992. Biodiversity in the Blue Mountains: a framework for monitoring and assessment. Paper submitted to (but banned from by Tom Quigley of the USDA Forest Service) Proceedings of the Blue Mountains Biodiversity Conference, May 26-29, Walla Walla, WA. Also see pp. 214-215 in Noss, R.F., and A.Y. Cooperrider. 1994. *Saving Nature's Legacy*. Island Press, Washington, DC.

VIRGINIANS FOR WILDERNESS

During the past year the energy of Virginians for Wilderness has been directed to the following projects:

1. Continuing biological surveys in the Central Appalachians, primarily through field work but also through published information.

2. Attempts to correlate biological data such as forest type and indicator species with geological structures, trend lines, and rock types. Of particular interest is the identification and position of carbonate-bearing strata and limestone karst relative to public lands. A report is in preparation.

3. Utilization of data gathered for forest protection. In particular we set a precedent by obtaining action on our complaint to the Inspector General of the US Dept. of Agriculture. The result was suspension of six timber sales for further environmental studies to satisfy the Endangered Species Act and eventual cancellation of three of these sales.

4. Utilization of these data in laying the groundwork for wildland reserves and the eventual drafting of legislation for a "Central Appalachian Ecosystem Protection Act" or equivalent.

5. Working with Save America's Forests as part of their program of documenting special areas around the country threatened by recent federal legislation. We provided information on rare species, roadless areas, and forest types in the Shenandoah Range.

6. While working on these projects, we have been strengthening our relations with other environmental groups in the Central Appalachians. We have become a member group of the West Virginia Highlands Conservancy and continue to work with such groups as the Central Appalachian Biodiversity Project, Corridor H Alternatives, the Mountain Heritage Alliance, and the West Virginia Environmental Council.

—Bob Mueller, *Virginians for Wilderness* (Rt1 Box 250, Staunton, VA 24401)

KENTUCKY HEARTWOOD INTENSIFIES EFFORTS TO PROTECT DANIEL BOONE NATIONAL FOREST

A poll showing that three-fourths of Kentuckians oppose logging on public land energized forest protection work in Kentucky in 1995. As expected, the Forest Service ignored the findings and is pursuing a logging campaign that targets biologically-significant areas, including two massive salvage sales under Logging Without Laws [the forest "salvage" rider].

Abuse of the 685,000 acre mixed mesophytic forest in Kentucky is compounded by off-road vehicle (ORV) use. With at least three corporate-syndicated motorized events on the Daniel Boone, the forest has become a national romping ground for four wheelers.

Kentucky Heartwood's public challenges of these practices have exposed the Forest Service's disregard for the land. During an eight month mapping project, Kentucky Heartwood volunteers read every timber sale contract filed at Forest Service headquarters and produced a map that documents the agency's logging history.

Kentucky Heartwood protested and sued over salvage logging that encompasses endangered Indiana Bat maternity colonies. We launched a Road RIP campaign, began a video documentary, and increased the number of citizen monitors in the forest.

Most important, we helped form a state-wide coalition to write a Citizens' Alternative to the Daniel Boone Forest Plan, which is under revision this year. Our Alternative sets restoration goals, expands protection of wilderness and other special areas, ends logging and ORV use, and establishes criteria for sustainable recreation and other uses of the forest. Highlights from the Citizens' Alternative include:

- a) Designate as Biodiversity Protection Zones all special sites identified by the Kentucky Nature Preserves Commission and The Nature Conservancy in order to ensure protection of their unique species or ecosystems;
- b) Create a Jellico Mountain Wilderness of approximately 40,000 acres just south of Holly Hill, KY, and extending to the Tennessee border;
- c) Create an underground Wilderness in the Cave Creek Cove watershed in the Somerset District;
- d) Establish a Cave Protection Zone, including caves and all land areas with limestone or other soluble rocks within 100 feet of the ground surface, to protect the integrity of fragile underground ecosystems;
- e) Enact a moratorium on road construction and set a goal of lowering forest-wide road density to 1.5 miles per square mile of land area;
- f) Institute a user fee system with costs based on the impact of each use on the forest.

We have had strong support for the Citizens' Alternative thus far, and would like to ask for your endorsement as well. Contact KY Forest Watch, POB 298, Livingston, KY 40445 for a copy of the Alternative. Urge the Forest Service to end exploitation of the forest and support the Citizens' Alternative to restore the beauty and ecological integrity of the Daniel Boone at: Forest Planning, Daniel Boone National Forest, 1700 Bypass Rd., Winchester, KY 40391 (606) 745-3100.

—Chris Schimmoeller, *Coordinator, KY Heartwood* (660 Mt. Vernon Ridge, Frankfort, KY 40601)

WARD VALLEY BATTLE CONTINUES

America's nuclear power industry has selected a corner of California's eastern Mojave Desert to become a nuclear sacrifice area; but the persistent ten-year resistance by environmental activists, citizens groups and Native American tribes has turned Ward Valley into a battleground over national policy on the responsibility for and method of radioactive waste containment. [See *Wild Earth* spring 1994.] The State of California and the nuclear power industry plan to bury radioactive wastes in shallow, unlined trenches above an aquifer, 18 miles from the Colorado River, in the midst of critical habitat for the Desert Tortoise, a Threatened species, and on land considered sacred by the five lower Colorado River Indian tribes.

Ward Valley is surrounded by eight newly designated Wilderness Areas. Striking natural features and ancient petroglyphs are found in the protected canyons of the Old Woman Mountains. Volcanic fins slice through metamorphic rock in the Stepladder Mountains, and the bristling Bigelow Cactus Garden covers hundreds of acres of desert foothills.

The Ward Valley controversy is the confluence of many issues, including heated debate on nuclear power; Native American land, water, and cultural rights; wilderness protection; the potency of the Endangered Species Act (ESA); and citizen response to government plans for nuclear waste disposal. The contest over Ward Valley is full of high-stakes intrigue. In 1993, activists and Indian tribes stopped a federal land transfer with a lawsuit which led to the designation of 6.4 million acres of Critical Habitat for the Desert Tortoise under the ESA. Last September, despite vehement opposition from US Senator Barbara Boxer (D-CA), Secretary of the Interior Bruce Babbitt announced his intention to transfer federal land at Ward Valley to the State of California for construction of the dump, but quarreled with Governor Pete Wilson over conditions of the transfer.

Meanwhile, congressional allies of the nuclear industry attached an amendment to the budget reconciliation bill that would have forced an unconditional land transfer, exempted the dump project from all environmental regulations, and precluded the public's right to challenge the maneuver in the courts. After a massive outpouring of public sentiment against the dump, Clinton cited the Ward Valley rider as one of the reasons for his veto of the budget bill.

In October 1995, hundreds of activists held a protest encampment at Ward Valley and established an occupation of the site that continues to this day. The five lower Colorado River Indian tribes have voiced their resolute opposition to the dump and have been joined by over twenty other Southwestern tribes.

Dump proponents complain that low-level radioactive wastes are piling up at hundreds of hospitals, universities, and biotech companies; but opponents insist that the vast

majority of the wastes slated for Ward Valley are long-lasting radioactive toxins from nuclear power plants which would threaten to contaminate the ground water and eventually the Colorado River. The dump contractor selected for the project, a firm by the name of US Ecology (formerly Nuclear Engineering Corporation), has operated four leaking radioactive waste dumps.

In February 1996, responding to the exposure of a cover-up of information about US Ecology's leaking dump at Beatty, Nevada, Deputy Secretary of the Interior John Garamendi announced that he was ordering two new studies at the Ward Valley site: a Supplemental Environmental Impact Statement (SEIS), and a test to determine the rate at which tritium (radioactive hydrogen) from atmospheric nuclear testing has migrated through the arid soil. Garamendi selected the Lawrence Livermore Laboratories, a Department of Energy facility involved in nuclear weapons research and development, to conduct the tests. Bureau of Land Management California Director Ed Hastey, a long-time dump proponent, will oversee the SEIS. The studies will take about a year.

The announcement is a mixed blessing. On one hand, it gives dump opponents more time to organize grassroots resistance. On the other hand, Garamendi's statement that the Interior Department "will review the conclusions of the SEIS, as well as the tritium tests, and determine appropriate conditions for transfer at that time," worries activists. The broad coalition of dump opponents adamantly opposes any federal land transfer for the purpose of building a dump and has vowed to protect critical habitat and sacred Indian lands.

—Philip M. Klasky, a poet, writer, and teacher, is co-director of the BAN Waste Coalition



Springtime in the Desert

For more information, videotapes, or speakers, call the BAN Waste Coalition at (415) 752-8678.

Delineating A New Protected Area in Northern Chihuahua

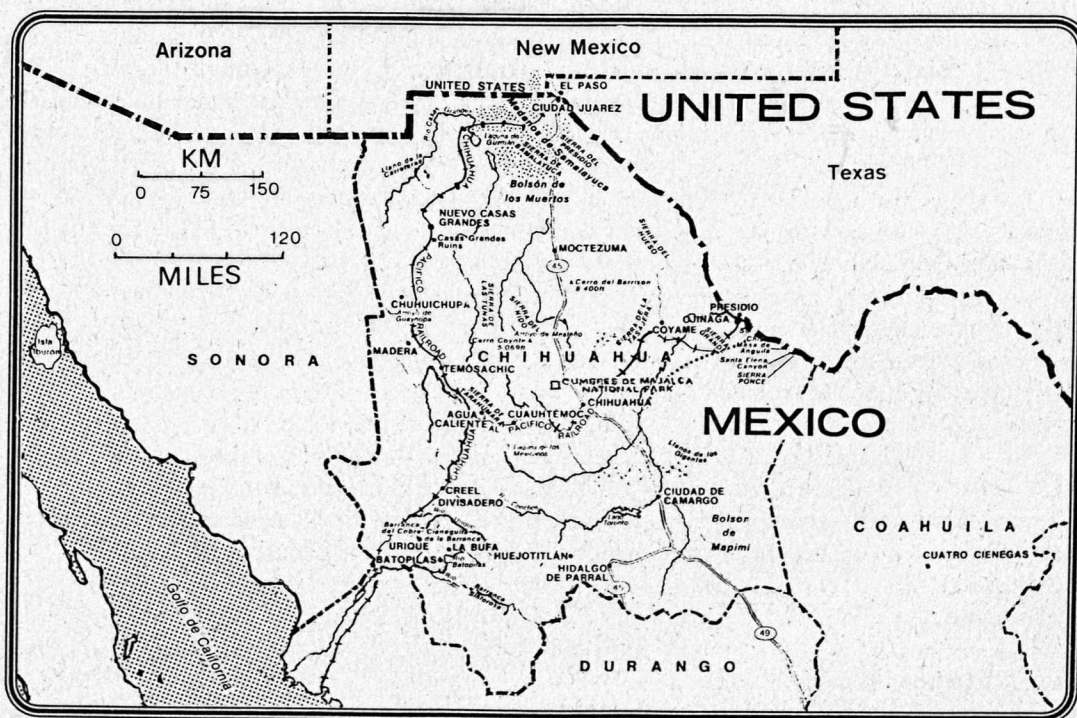
by Brian Miller

INTRODUCTION

A group of people at the Universidad Nacional Autonoma de Mexico (UNAM) is working to start a protected area on the high plains grasslands of northern Chihuahua. The area includes the largest remaining Black-tailed Prairie Dog (*Cynomys ludovicianus*) complex in North America. Nearly all of the field work for this reserve has been done by several graduate students through the Centro de Ecologia of the UNAM—namely Jesus Pacheco, Rurik List, Paty Manzano, Mario Rojo, Federico Romero, and Georgina Santos—who have lived in the region, talked to the local people, and gathered the scientific data. Gerardo Ceballos, a professor with the Centro de Ecologia who hatched the idea to start this reserve, is working with the government on the federal decree for protected status; and he and I have played supporting roles in the field work (largely helping plan and writing grant proposals). Finances were contributed by US AID, Conservation Food and Health, National Fish and Wildlife Foundation, CONABIO, DGAPA, USFWS, and PIC Technologies.

A goal is to purchase a core area for the nucleus of the reserve. Ownership would provide a strong guarantee toward conservation, and we could then protect the surrounding land by working through government bodies and local residents. Buffer zones would help assure linkage of habitats, and allow corridors wide enough to encourage the move-

ment of species that would not travel through unsuitable habitat. It would be feasible to conserve large, high quality examples of the various Chihuahuan ecosystems by this core-buffer zone-corridor model, and the buffer zones could eventually cross the border to link with projects in the US. The need for this type of international protected area in the Chihuahuan Desert has been discussed since 1945 by Mexican and US officials.



The center of this potential reserve is located about 75 kilometers south of the US—Mexico border. The Chihuahuan Desert, which crosses that border, is critical to regional and hemispheric biodiversity. The area is evolutionarily unique, biotically diverse, sensitive, and threatened, and it is one of the least studied parts of North America. Testimony to Chihuahua's remoteness, the endemic Bolson Tortoise (*Gopherus flavomarginatus*), North America's largest land tortoise, was discovered only about 40 years ago.

PRESERVATION OF BIOTIC INTEGRITY

We emphasize that biotic *integrity* is a better term than *diversity*, because quality of species can be more important than quantity. Quality means native species which specialize on the local conditions in some way. Quantity, on the other hand, can be represented by a high number of generalists that exist over a wide variety of habitats, or it can be artificially increased by invading species that follow the ecological edges left by habitat fragmentation. (See Sampson and Knopf 1982 and Van Horne 1983 for more detail on this topic.) The maintenance of quality usually requires large natural areas because species that occur in undisturbed, original vegetation typically need larger habitat blocks than species able to thrive in disturbed or exotic vegetation.

The high plains grasslands of North America have a native fauna with many forms that lack close relatives anywhere else in the world. The Black-tailed Prairie Dog complex, at 55,258 hectares, houses as many as 1,500,000 of that keystone species.

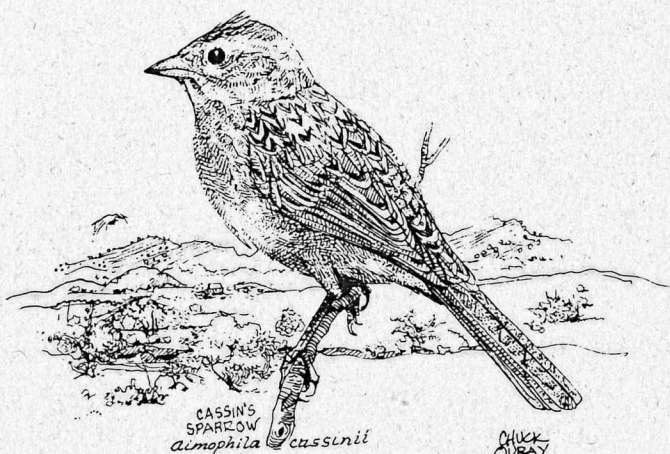
In the US, prairie dog populations have declined rapidly this century, and the management of prairie dogs is a major biodiversity issue. Ecologically, the prairie dog ecosystem is an oasis of species diversity on the arid plains. It supports higher numbers of small mammals and arthropods, nearly six times the number of terrestrial predators, and higher numbers of birds (both number of species and density), compared with surrounding areas.

Poisoning programs, subsidized by the US federal government, have reduced prairie dog populations as much as 98% in the last 100 years, and they continue today. For example, in 1986 and 1987 a 110,000 hectare Black-tailed Prairie Dog complex, which was the largest in North America at the time, was eliminated in South Dakota. Previously, from 1980 to 1984, 185,600 hectares of Black-tailed Prairie Dogs were poisoned on the Pine Ridge Indian Reservation of South Dakota.

Because of these control activities, several species depending on the prairie dog ecosystem have been proposed for, or granted, protected status under the Endangered Species Act of the United States. Noteworthy are the Ferruginous Hawk (*Buteo regalis*), Mountain Plover (*Charadrius montanus*), Swift Fox (*Vulpes velox*), and Black-footed Ferret (*Mustela nigripes*). The Burrowing Owl (*Atene cunicularia*) has not been listed federally in the US, but is declining and is recognized as locally rare. Ferruginous Hawks, Burrowing Owls, Mountain Plovers, Golden Eagles, Bald Eagles, and Swift Foxes are found on the prairie dog colonies of the proposed protected area. In addition, it is the largest potential reintroduction site for Black-footed Ferrets. At peak capacity, the prairie dog complex could hold an estimated 5000 to 6000 Black-footed Ferrets (adults and young). Such a large complex may be critical to the long-term recovery of the Black-footed Ferret as well as other declining species dependent on that system.

*The Chihuahuan Desert...is
evolutionarily unique, biotically
diverse, sensitive, and threatened, and
it is one of the least studied parts of
North America.*





The protected area would extend into the coniferous forests of the Sierra Madre Occidental, and those mountains hold the Mexican Spotted Owl (*Strix occidentalis*), Goshawk (*Accipiter gentilis*), Thick-billed Parrot (*Rhynchopsitta pachyrhyncha*), Military Macaw (*Ara militaris*), cats, bears, big game, migratory birds, and prime habitat for the Mexican Wolf (*Canis lupus*). It has been reported that a critical threshold for wolves was reached when the road density exceeded 0.6 to 0.67 km/km²; above that density, wolves did not persist. The road density in a 2500 km² area encompassing the potential protected area is 0.05 km/km², and none of the roads are paved.

In addition, the northern Chihuahuan grasslands are the principal wintering area for many North American grassland birds (Raitt and Pimm 1977). As a group, endemic populations of grassland birds have declined more rapidly, more consistently, and over a wider geographic area than any other group of birds in the last 25 years (Knopf 1993). For examples, Knopf noted that three western grassland birds, the Lark Bunting (*Calamospiza melanocorys*), the Mountain Plover, and Cassin's Sparrow (*Aimophila cassinii*) have declined more than 60% since 1968.

The proposed protected area affords opportunities for Mexico and the US to cooperatively restore and protect biodiversity. In addition, the protected area would provide employment and income opportunities for the local population, facilitate further research on managing complex biological interactions, enhance career development of conservation biologists, and augment environmental education. The cooperative bonds forged by these endeavors would encourage conservation of many other sensitive species presently managed by both Mexico and the US.

As a result of the graduate students living in the town, relations with the local people are good. The ejido of San Pedro has donated a small amount of their land for a field station at the reserve, and that building was recently completed. When the state of Chihuahua advanced a plan to poison the entire prairie dog complex, the local government voted in favor of the protected area over the plan to poison.

The group has been collecting published and unpublished information necessary to develop a management plan for the area (maps, demographic statistics, political and economic data, resource laws, early plans for resource development, and studies on comparable ecosystems and species). This information, along with resource mapping, will help delineate core and buffer areas of protection. The maps will reflect economic resources, ecosystem boundaries, land ownership, and land use.

Students are now conducting inventories of species and ecosystems for the planning and design of the protected area. The surveys will go beyond simple species richness (alpha diversity) and also assess biotic integrity via beta diversity (the change of species among different habitat types or among disjunct blocks of the same habitat). Habitat evaluation should be founded on demographic studies instead of only presence/absence as determined by the literature or models that exclude the effects of competition and predation. By initiating field demographic studies, one can separate low quality habitats, which may contain deceptively high densities of dispersing subordinates that are unlikely to survive and reproduce, from high quality habitats with stable, dependable adult populations (Van Horne 1983).

Environmental education and attitude assessment of the local population began in late 1994. A protected area also needs capable managers, planners, researchers, and rangers. Education without good employee-resident relationships will fail to raise consciousness about the protected area. It will, therefore, be very important to train and employ local people via a series of workshops.

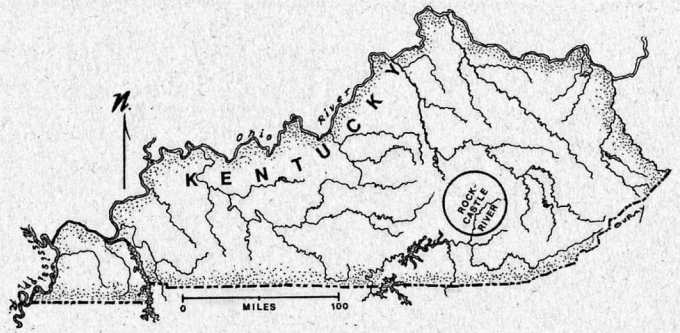
In conclusion, we hope the reserve is soon officially protected by federal decree. This would be one of the few areas established primarily to protect the prairie dog ecosystem, and the associated life-forms would all benefit. There is great potential for cooperation across the international border, and that could only benefit other sensitive species presently managed independently by both Mexico and the US. ■

Brian Miller works for the Instituto de Biología, UNAM and is on the Board of Directors for The Wildlands Project. He has worked with Black-footed Ferrets and the prairie dog ecosystem since 1984 and is co-author (with Rich Reading and Steve Forrest) of a book on that topic, Prairie Night (Smithsonian Press, 1996).

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illustration by Chuck Ouray



Cromer Ridge, Kentucky

Obituary for a Landscape

by Paul J. Kalisz

INTRODUCTION

Cromer Ridge, referred to as "Kentucky-909," lies along the south side of the Rockcastle River on the escarpment that defines the western edge of the Cumberland Plateau physiographic region (Fig. 1). The character of the place is defined partly by the mauve sandstone cliffs that form the escarpment; partly by the woodrats (*Neotoma floridana*), bats, and unique plant assemblages that inhabit the rockshelters in the cliffs; and partly by the diversity of its life-forms including endemic salamanders, crayfish, earthworms, mussels and woodland herbs. The cool ravines and protected slopes below the cliffs are occupied by 75-100 species of trees and shrubs which form the mixed mesophytic forest—the crown-jewel of the eastern deciduous forest region—while the ridge tops are covered with xeric oak and pine stands that as recently as 50 years ago were inhabited by the northernmost population of the Red-cockaded Woodpecker (*Picoides borealis*, an Endangered species). Soils below the cliffs are dark and loamy, reflecting the abundance of soil life and vegetable mould and the influence of the shale, siltstone, and coal that form the bulk of the geological column in the region. Soils above the cliffs are shallow and sandy, and full of rounded pebbles of pink chert, relics of an ancient river that have weathered out of the sandstone parent rock.

In 1974, dune buggies became the first off-road vehicles (ORVs) to invade the isolated mountain land north-west of the 909 exit off the then newly constructed highway, I-75. Within five years motorcycle use was heavy, and local landowners all but abandoned their efforts to prohibit the trespass of the horde of weekend riders. Trails spread rapidly throughout a 100-acre forested area, but the exhibitionism intrinsic to ORV riding led to a concentration of activity on 40 acres of land that included a ridge-top mud hole and a variety of trails and jumps leading from the ridge to the lower slopes.

Obituary: [ML. obituarius < L. obitus] A published notice of death, usually with a brief biography.



Figure 1. Map showing the location of the Kentucky-909 ORV site relative to various natural and cultural features. The Rockcastle River corridor to the north of the ORV site is designated as having "high global significance" in terms of the occurrence of rare species and communities.



Figure 2. Students in FOR 205, fall semester, 1993, standing in a 15-ft deep gully eroded into the sandstone bedrock on the ridge top at the Kentucky-909 ORV site. The 254-mile long Sheltowee Trace National Recreation Trail passes along the right side of the gully.

Twenty years after the first dune buggy rut was formed, I arrived at the Kentucky-909 site with two of my co-workers and 12 students enrolled in my Forestry 205 class (Forest & Wildland Soils & Landscapes) at the University of Kentucky (Fig. 2). Our goal was to augment what Webb and Wilshire (1983:72) described as a scarcity of quantitative data documenting the effects of ORVs on native ecosystems. We intended to write an obituary for the Kentucky-909 landscape in the form of a scientifically valid inventory of the effects of 20 years of ORV traffic on the 40-acre nucleus of the site.

METHODS

The 40-acre study area was located on an air photo and subdivided into four 10-acre parcels. Measurement of various ecosystem properties was then performed using the procedures described by Howes et al. (1983). Twenty 100-ft long transects were randomly located in each parcel. The following conditions were measured using percentage of the transect length as an estimate of the percentage areal occurrence: ground area with surface disturbance of any sort, ground area occupied by roads or trails, ground area occupied by forest, ground area with evidence of soil erosion. In addition, erosion depth was estimated along each transect and weighted by length to allow calculation

of average erosion depths. The line-transects were then expanded into 10-ft wide band-transects composed of twenty rectangles, 5-feet wide by 10-feet long, and the importance of each of the following conditions was evaluated based on the percentage of blocks in which each condition occurred: trash, trees with damaged stems, trees with exposed or damaged roots, exotic (non-native) plant species. Penetrometer resistance, a measure of soil permeability or degree of soil compaction, was also measured at 38 disturbed and 19 undisturbed points randomly located along the transects.

After all data were collected, 41 transects that were found to have >85% of their lengths disturbed were designated as the "disturbed" treatment, representing the effects of 20 years of ORV activity; 34 transects that were found to have >85% of their lengths undisturbed were designated as the "undisturbed" treatment, representing an internal control. The five transects with intermediate amounts of disturbance were eliminated from further consideration. Non-parametric Mann-Whitney U-tests were run to compare disturbed and undisturbed areas in terms of the percentage of the ground area occupied by ORV trails, forest vegetation, eroded ground surface, trash, trees with stem damage, trees with root damage, and exotic plant species. The same analysis was also used to compare soil penetrometer readings between disturbed and undisturbed areas.

illustration by Paul Kalisz

RESULTS

The results of our inventory are shown in Table 1. All of the measured characteristics differed significantly between disturbed and undisturbed portions of the study area, with a probability of less than 1 in 100,000 that the differences were due to chance alone.

Roads occupied one-quarter of the disturbed transects and about 14% of the entire 40-acre study site. Since the median road width was 16 ft, the road density for the entire site was 46 mi/mi². For comparison, commercial forest land in the Pacific Northwest typically has road densities of about 5 mi/mi², and the movement of large carnivores is inhibited even at densities <1 mi/mi² (Noss and Cooperrider 1994). Roads on the 909 site were also associated with the accumulation of trash; the invasion of *Lespedeza* (*Lespedeza cuneata*), Japanese Honeysuckle (*Lonicera japonica*), Multiflora Rose (*Rosa multiflora*), Crown Vetch (*Coronilla varia*) and other exotic plant species; and extremely high penetrometer resistances (n=16; median, 480 psi) and depths of soil erosion (n=39; median, 1.7 ft). The highest incidences of damage to tree stems and tree roots were also recorded adjacent to roads.

The median depth of erosion was 0.7 ft calculated over the entire 40-acre study site. This is equivalent to an annual loss of approximately 60 t/ac/yr, or to a total loss of nearly 10 million lb of soil over the 20 year period of ORV use. For comparison, the typical erosion rate for undisturbed eastern forests is about 0.25 t/ac/yr (Patric et al. 1984); the average rate for agricultural land in the Appalachian states in 1977 was about 6 t/ac/yr (Larson et al. 1983); and the rate for land that was deforested due to toxic emissions from a smelter in Tennessee was almost 200 t/ac/yr over a 17 yr period (Rothacher 1954).

CONCLUDING COMMENTS

We have served notice of Kentucky-909's passing, and have provided some biographical details regarding the life and death of the landscape. We have statistically described the gory appearance of an ecosystem slaughtered by recreational use of ORVs. Slaughtered by an activity that is incompatible with most other forms of recreation, but is still sanctioned on public lands in Kentucky, Ohio, and other states where the US Forest Service considers ORV-riding a "recognized activity" that is "encouraged and managed" and "permitted except where designated 'closed'." This is immoral and irrational. The recreational destruction of the earth by ORVs must be stopped. ■

Paul Kalisz is Associate Professor of Soils & Silviculture in the Department of Forestry, University of Kentucky (Lexington, KY 40546-0073) and a consultant for Appalachia—Science in the Public Interest (ASPI). Mark Spencer is a graphic designer and illustrator for ASPI (Route 5, Box 423, Livingston, KY 40445).

Table 1

Median values for a number of characteristics of disturbed and undisturbed portions of the Kentucky-909 ORV site. The "%" unit refers to the percentage of the area on which the specified characteristic occurred. Penetrometer resistance is in pounds per square inch (psi). All characteristics differed statistically between disturbed and undisturbed areas at a significance level of $P < 0.00001$.

Characteristic	Disturbed	Undisturbed
Roads (%)	25	0
Forest (%)	69	100
Eroded (%)	53	0
Trash (%)	15	0
Stem Damage (%)	29	10
Root Damage (%)	15	0
Exotic Plants (%)	5	0
Penetrometer Resistance (psi)	395	150

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Grazing and Forest Health

(or How Cows Worsen Forest Fires)

by Dennis Morgan

The grazing-induced transformation of the West began early. It would have been earlier, had it not been for the Apache, who effectively culled the plentiful herds of cattle and continually set fire to the grasses. Says Stephen Pyne in his book *Fire in America* (1982), "The fire regime of the Southwest [was] shaped by lightning and livestock, but the Apache was for centuries the intervening variable." With the Apache safely ensconced on reservations, overgrazing became a serious problem and the character of the land began to change drastically. Cows and cowboys became ubiquitous, garnering a near-mythological place in Western history.

When the bogus shroud covering the sacred cow is lifted, however, the litany of ecological evils associated with grazing is revealed as long and sobering. Even more so when one begins to see that Western ecosystems often today regarded as "natural" in fact have suffered fundamental changes due to livestock grazing. In a comprehensive review of the effects of grazing, Thomas Fleischner (1994) laments that "...some wounds are more conspicuous than others. Recognizing a clearcut forest is easy, but it often takes a trained eye to comprehend damage to rangelands. The destruction caused by livestock grazing is so pervasive and has existed for so long that it frequently goes unnoticed." It may be even more insidious than most critics of arid lands livestock grazing have thought. A substantial list of literature links grazing with high stand density (overstocking) in Western forests and thereby to the current forest health "crisis." While industry and agency call for a logging solution, calls for removal of cows are conspicuously absent.

A HISTORY OF DENIAL, NOT IGNORANCE

The US Forest Service has been quick to plead ignorance when admitting that their zealous commitment to fire suppression was a flawed policy which in large part bequeathed to us the overstocked, unhealthy, and flammable forests of the West. In truth, the agency has for years known that fire played a key role in forest ecosystems, yet the policy of suppression, and the path to "crisis," was still followed.

Warnings about the dangers of fire suppression were sounded early. In 1924 Aldo Leopold, then working for the Forest Service in the Southwest, warned that fire suppression was causing unhealthy overstocking of trees and that "yellow pine is reproducing downhill" and spreading into the lower elevation woodlands (Leopold 1924). By 1950, Harold Weaver, Regional Forester for the US Indian Service in Phoenix, reported that Leopold's predictions were clearly evident upon the land (Weaver 1950). He asked a seemingly simple question: "Shall we attempt to reduce the hazard in the dense stands, or shall we ask for larger and ever larger [fire suppression] budgets?"



Ponderosa Pine Cone by Douglas Moore

Weaver, who had extensive experience with fire in forest ecosystems in eastern Washington and in the Southwest, saw what was coming, and was an early advocate of prescribed burning.

Added to these have been other voices, and it seems inconceivable that the Forest Service could have missed this body of literature. Fire suppression was not a problem of ignorance but of denial. Regrettably, the Forest Service seems to be repeating this pattern with regard to livestock grazing. Continued denial is obviously not a viable alternative: the contribution of livestock grazing to reduced forest health must be recognized and confronted in proposed solutions.

GRAZING AND A SHIFT IN FOREST CHARACTER

An abundant literature shows that grazing has contributed to an increase in woody plants and shrubs across the western United States (see reviews by Arnold 1950, Ellison 1960, Bahre 1991, Archer and Smeins 1991). Also well documented, though given little attention, are studies showing that cattle grazing has significantly contributed to dense stands of "dog hair" thickets in forests across the western US (Weaver 1950, Rummell 1951, Madany and West 1983, Zimmerman, G.T. and L.F. Neuenschwander 1984, Savage and Swetnam 1990, Habeck 1990, Morgan 1994). Scientists have found that livestock grazing causes overstocking of trees primarily by removing grasses which would otherwise prevent seedling establishment. Grass inhibits seedling growth by a variety of mechanisms, including competition with pine seedlings for water and nutrients and acting as a fire vector, allowing low temperature surface fires to spread widely.

Cows also facilitate pine invasions by exposing soil and thus fostering the creation of seedbeds, and by destroying microbiotic (bacterial/fungal/lichen) soil crusts. Erosion associated with livestock grazing leads to formation of arroyos which lowers the water table and allows further seedling invasion.

Leopold, Weaver and numerous others harbored reservations about cattle grazing in addition to their concerns about fire suppression. While many believed that fire was the major factor in keeping grasslands and forests free of woody shrubs and dense stands of trees, Leopold was among the first to realize that the decline in wildfire frequency was both the result of a policy choice and of overgrazing (Leopold 1924). Indeed, some foresters of the day encouraged overgrazing (as do some even today) so that the herbaceous fuel load would be broken up to provide firebreaks against the cool fires that had previously crept over the grasslands and forest floor, killing many young tree seedlings. Also in the early 1920s pioneering Southwest silviculturalist G.A. Pearson noted that Ponderosa Pine seedlings were more likely to successfully establish and grow vigorously where herbaceous vegetation was heavily grazed than where grass was thick (Pearson 1923). He noted that the invasion of heavily grazed areas by pine seedlings was conspicuous in northern Arizona.

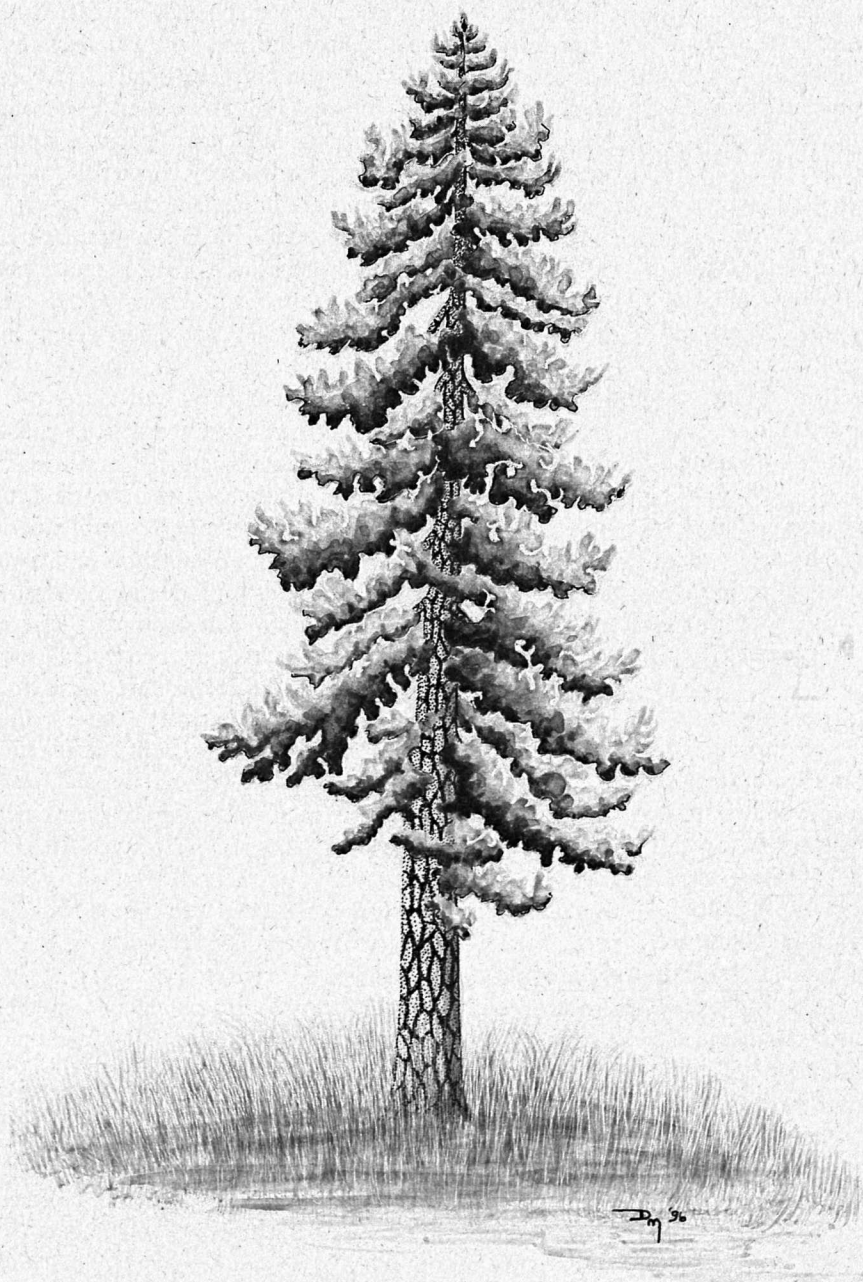
In a series of papers published in the 1940s and 50s, Weaver built a case for the connection between livestock grazing and higher density tree stands, showing that overgrazing was "of great significance in development of such stands, through breaking up of original sod cover and preparation of mineral seedbeds. Such appears to be of particular significance in the Southwestern forests." Weaver warned that the future of these forests was in jeopardy.

In a comprehensive look at changes in Southwestern pine forests since white settlement, Cooper (1960) echoed Weaver's concerns, stating that "The overuse and mismanagement which followed introduction of livestock into the West produced profound changes, some of them permanent, in the plant cover. In particular, overgrazing has often been assigned as the primary cause of the overabundance of young pines. Many of the early arguments against reduction of grazing on the national forests were based on the premise that heavy grazing made forest fires much less frequent." Ellison (1960) and later Archer and Smeins (1991), in reviewing the influence of grazing on plant succession, describe the process whereby grazing allows the introduction of woody plants, shrubs, and trees (including Ponderosas) into rangelands and forests. Ellison surmised that the invasion of grasslands by trees in the broad, irregular transition from forest to prairie in the Midwest may have been caused by a factor seldom suggested or studied: overgrazing by livestock.

While the ecological processes involved in tree overstocking are relatively clear, the question of which variable is the primary cause of overstocking—grazing, or active fire suppression—long vexed scientists because it was (and still is) difficult to find an ungrazed forest for a control plot. In 1923 Leopold wrote, "Whether grass competitors or fire was the principal deterrent to timber reproduction is hard to answer because the two factors were always paired, never isolated. Probably either would have inhibited extensive reproduction." Eventually, however, at least three field studies were able to isolate the "paired" variables: these studies found that grazing was the principal factor in causing pine overstocking.

Rummell (1951) studied two neighboring and ecologically similar Ponderosa Pine forests in central Washington. One had been grazed for 40 years, while the other had never been grazed by livestock. Neither had experienced a fire for at least 125 years. Rummell characterized the ungrazed forest as "one of the few relicts of virgin ponderosa pine forest and range" with "an almost unbelievably lush mat" of pine grass. It could be, Rummell felt, "a top standard against which many other pine forest ranges with similar climate and physiography can be compared."

Significantly, very little pine reproduction was found: only 85 trees per acre less than 4' dbh were present.¹ In sharp contrast, the grazed forest had little grass and 3291 trees per acre less than 4' dbh (2033 pines, 1016 Douglas-firs, and 242 Western Larch).



Rummell concluded that the high density of herbaceous understory vegetation on the ungrazed forest contributed substantially to the low tree reproduction rate. Overall, "heavy grazing of the herbaceous understory vegetation, rather than exclusion of fire, appeared to be the prime factor in explaining the dense tree reproduction" on the grazed forest.

A similar study was conducted in 1983 on two areas in Zion National Park "almost identical biotically and environmentally" (Madany and West 1983). They had similar fire histories but markedly different grazing histories. The Horse Pasture Plateau was heavily grazed until about 1960, while Greatheart and Church Mesas—isolated by cliffs and slickrock—were never grazed and approximated pre-settlement conditions. Both areas were dominated by Ponderosa Pine and Gambel Oak, and both had a similar history of browsing by large ungulates.

The authors characterize the study area as "uniquely suited to allow independent assessment of the relative importance of fire cessation and livestock grazing in the conversion of savannas to forests." They state that the visual contrast between the areas was obvious, with dense thickets of Ponderosa Pine, Gambel Oak, and Rocky Mountain Juniper saplings prevalent on the grazed plateau and largely absent on the ungrazed mesas. They note that fire had been excluded from all the study areas but state that:

...decreased fire frequency alone is not the essential factor needed to cause these physiognomic changes. The presence of savanna conditions on Church and Greatheart Mesas despite long fire-free intervals is the strongest evidence yet for our contention....The fact that there were no thickets of "dog-hair" ponderosa pine on either mesa despite a comparable absence of fire, implicates livestock grazing as the critical factor.

Fire, they say, "may have been the most important secondary factor for the maintenance of savanna conditions."

They conclude that:

Our findings challenge the widely accepted notion that the high frequency of fires in ponderosa pine savanna was the prime cause for the prevention of succession to denser stands of ponderosa pine or to shade-tolerant but fire-sensitive conifers.... However important fire may be for management and maintenance of ponderosa pine communities, the key factor in the widespread conversion of savanna to forest seems to have been livestock grazing.

The third study (Zimmerman and Neuenschwander 1984) looked at grazed and ungrazed Ponderosa Pine and Douglas-fir stands in the foothills of the Bitterroot Mountains of Idaho. Zimmerman and Neuenschwander found the grazed stands of both species had more young trees. They, too, concluded that "livestock grazing was probably the principal factor in creating and maintaining conditions that favored increased tree regeneration." They also predicted that if the grazed stands did not burn, they could "stagnate, causing reductions in growth rates and increased susceptibility to damage from insects and disease." This study is of great significance in that their results suggest that if grazing is excluded and grasses allowed to return, Douglas-fir and Ponderosa Pine regeneration decline. In time, the forests might once again approach their original healthy state.

CONCLUSION

Information connecting cattle grazing to increased stand density, and thus decreased forest health and some of the "catastrophic wildfires" of late, has been available for half a century. However, the implications for forest health have been ignored, like the importance of fire was for so long. It is time that the role of cattle in perpetuating forest health problems be addressed, as opposed to relying on an ecologically destructive, hurriedly contrived salvage program. Livestock grazing is not just a range issue. It is a silvicultural problem and therefore should be analyzed in timber sales, salvage sales, juniper pushes, and other silvicultural activities. Further, the problem is not just historical: As long as livestock remain, the problem remains.

The Apache did a good job of maintaining ecosystem health by burning areas and, with the wolves, thinning the cattle herds. In some areas they never stopped burning. On the Apache reservations in Arizona today, traditional wisdom and fire-fighting budget limitations (in contrast to the Forest Service's blank check for fire-fighting) have translated into much less rigid practices of fire suppression. Harold Weaver was there in the 1950s to foster an active prescribed burning program; the San Carlos Reservation today burns more land than the entire US Forest Service. Most Western lands, however, ache for a cool, cleansing burn. A necessary first step toward that is removing cows, and letting the grass return. ■

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Dennis Morgan wrote this while on sabbatical with the Southwest Center for Biological Diversity in New Mexico from the temperate rainforests of Oregon and British Columbia. He now lives in Bamfield, BC. For an annotated bibliography of grazing and forest health literature, contact the Southwest Center for Biological Diversity: POB 17839, Tucson, AZ 85731; 520-733-1391. The author thanks Joy Belsky, Staff Ecologist at the Oregon Natural Resources Council in Portland, Oregon, for her work in this area.

The Dusky's Demise

The Extinction of *Ammodramus maritimus nigrescens*

by Michael Marshall

A lone male sparrow perches on the diagonal crossing of two broomgrass stems. He has been singing for hours today, as he did yesterday and the day before. Occasionally, he hears the distant call of another male sparrow, but more frequently he hears the steady drone of traffic, zooming by on a long stretch of asphalt that was once salt marsh. The time is 1978, the heyday of the Endangered Species Act (ESA) of 1973 and the most controversial cross species legal case: Tennessee Valley Authority vs. Hill, commonly referred to as Tellico Dam v. the Snail Darter. Even in the midst of that environmental epic, the tragedy of the Dusky Seaside Sparrow approached its final chapters.

Ecology

The Dusky Seaside Sparrow (*Ammodramus maritimus nigrescens*) once inhabited the salt marshes of the central eastern coast of Florida. This subspecies was originally limited to a few locations in Brevard County where a particular species of broomgrass, *Spartina bakerii*, provided shelter and protection from predators. The broomgrass, in turn, depended on the regular cycles of wet and dry conditions in the marsh. As the coast of Florida drew more and more people, earthen dikes were constructed to keep mosquito populations in check. The diked impoundments were flooded continuously to prevent the mosquitoes from laying eggs in the moist soils of the salt marshes. Unfortunately, these flooded impoundments harmed the native broomgrass, limiting the habitat upon which the Dusky depended. By 1956, all of the known Dusky breeding habitat had been completely impounded by dikes (Trost 1968).

Early Warnings

The first warnings of the Dusky's decline came in the mid-50s, when local naturalists reported a noticeable reduction in populations compared to previous birding seasons. Two subsequent studies, Trost (unpub. data) and Sharp (1970), confirmed the decline in Dusky numbers. Both studies attributed habitat loss due to diking as the primary cause of the decline, and both authors made recommendations to curtail that decline. In both cases, all recommendations were ignored until 1969 when, following an increase in public attention, floodgates were experimentally installed in some of the impoundments surrounding part of the Dusky's habitat. The new periodic flooding regime, although good in intent, only verified the observations made in the prior studies that broomgrass does better in moist, not continually flooded, saline soils.



illustration by Joan Waltermire, from *A Shadow and a Song: The Struggle to Save an Endangered Species* reprinted courtesy of Chelsea Green Publishing

Conservation Efforts

Official protection for the Dusky Seaside Sparrow first came under the Endangered Species Preservation Act of 1966. On 11 May 1967, the Dusky was officially listed as endangered; but this act did not allow for the purchase of critical habitat for subspecies and did not enforce protection. In response to another threat to remaining habitat, by the new Beeline Freeway, The Nature Conservancy bought the first acres of critical habitat for the Dusky in 1970 and 71. Under the Endangered Species Act of 1973 (ESA), the Dusky was protected from capture, killing and harassment, but Dusky numbers had already plummeted from about 2000 pairs in 1956 to 54 pairs in 1973 (Kings 1981). Encroaching human development, manifested as intentional marshland draining and burning through 1977, continued to diminish the sparrow's numbers. When a recovery plan had finally been produced, by a politically appointed recovery team in 1979, less than 29 males were left (King 1981). The last female Dusky was seen in 1975 and the last male died in captivity on 16 June 1987 (USFWS 1987).

Lessons from Extinction

The primary purpose for profiling an extinct species is to learn from past mistakes and disseminate knowledge to the public that they can use to work toward the preservation of currently endangered species. Although many factors contributed to the Dusky's extinction, two stand out as important present forces of extinction for other species. *Habitat loss* was the most obvious proximate cause of the Dusky's demise, as it has been of many other exterminated organisms; but what is the ultimate cause of the present extinction rate? Some believe it is *human overpopulation*. Hall and his colleagues (1995) estimated that the contribution of one US citizen over the course of his or her lifetime to wetland loss is approximately .05 hectares. For most people, this impact occurs indirectly through conversions from wildlife habitat to cropland and pastures (Hall et al. 1995), but this statistic provides a tangible example of the relationship between human population growth and the degradation of other organisms' habitat.

An improvement in the implementation of the Endangered Species Act might have prevented the Dusky's extinction and could save other species. Miller and others (1994) suggest two guidelines for the design of an endangered species recovery team: include recognized biologists who have experience with the endangered species, and exclude members who primarily represent an agency. In the case of the Dusky, the most knowledgeable biologist was not even considered for the recovery team and three of the four team members knew little or nothing about the bird (Walters 1992). ■

Michael Marshall is a student in the biology department at the University of New Mexico.

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A Canoe Drag over Honker Divide

by Richard Carstensen

PREFACE

Honker Divide is a controversial watershed in Southeast Alaska's Tongass National Forest. The Sweetwater and Thorne River drainages on Prince of Wales Island back up against a shared low-elevation divide, "The Honker," easily portaged. In a region better known to kayakers than to canoe trekkers, Honker Divide received scant attention until Alaskans realized they were about to lose it. For two years running, American Rivers has listed Honker Divide as one of the ten most endangered freshwater systems in North America. Under bombardment by the Alaskan Congressional delegation, the Forest Service has been forced to ignore a carefully crafted Citizens Alternative which would have allowed logging elsewhere on Prince of Wales Island while protecting Honker Divide.

Wilderness travelers should note two remarkable distinctions of Honker Divide. You can paddle from the ocean deep into the heart of the third largest island in the United States, carry for a mile or two, and then slip down the Thorne River back into the sea. Also, you can camp on an island in a lake on an island. Such is the amphibious personality of Southeast Alaska's Alexander Archipelago!

But threats to ecological integrity are more serious than the potential loss of recreational values. The recognition comes late. Prince of Wales, in extreme southern Alaska, was widely viewed by loggers and environmentalists alike as the "sacrifice" island, where timber extraction dominated, presumably in trade for wilderness to the north. In a world that separated work from play, and concealed clearcuts from tourists, this made a weird kind of sense. Even now, the "Big Three" of Southeast Alaskan ecotourism are tidewater glaciers, whales, and Brown Bears, and Prince of Wales Island comes up short in the icon count.

As we close down the twentieth century, Alaskan conservation is growing up. Biogeographers now recognize that the thousands of islands of our archipelago support more endemic mammal taxa than any other National Forest. Some held ice-free refugia, where plants and animals may have survived the Wisconsin Glaciation. Prince of Wales Island cavers are emerging with the bones of Caribou (now extinct in our region), and bears which died 40,000 years ago. The Honker Divide—the last large unlogged block on the ecologically wealthiest island in Alaska—asks us to probe beyond recreational icons, to older, subtler values of a wild island.

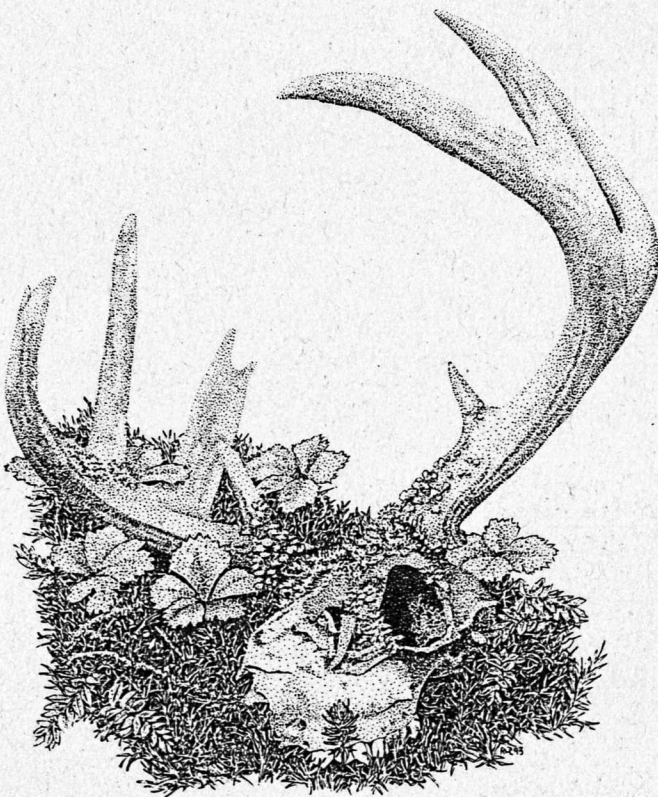


illustration by Richard Carstensen

Landscape Stories

Newcomers to Southeast Alaska are enticed by the spectacular but ecologically simple: towering rock cliffs, calving ice bergs. And some of us never outgrow glacierlust. But the taste in wild land slowly matures, tempered by reverence for the ecologically complex and mellowed by the allegiance to the ancient communities that recover for life what ice wastes. Glacier trips are flings. Our residence and marriage, here in coastal Alaska, is to the labyrinthian green miles of low-land old growth. Alaska's supreme forest complexity lies south, on the giant island the Tlingit call *Taan* or "sea lion." Prince of Wales Island, POW, now surrendered to the saw.

On Prince of Wales Island, our marriage is abusive. Above the timber-wed villages and trailer camps, the old growth is stripped from ridge top to creek bottom. The road-bound traveler is stunned. But immediately northwest of Thorne Bay, once the world's largest logging camp, lies four canoe-day's worth of unprotected wilderness, miraculously uncut — Honker Divide.

Judged by an ecologically matured taste, Prince of Wales Island was Alaska's best. Honker Divide is the last of the best. For me, a northern Southeast Alaskan naturalist, Honker Divide was humbling. Maybe it's dumb to fall in love with the profoundly rich places; they fare so sadly at our hands. But it's too late now. I'll come back to Prince of Wales.

In mid-June 1993, Sue Warner, Ken Leghorn and I flew south from our homes in Juneau to join Craig residents Nola Kathleen, Jerry Sharrard and Mike McKimens, who wanted to show us the imperiled drainages of Hatchery Creek and Thorne River. With three canoes lashed to one truck canopy, we drove northeast from Craig to Thorne Bay. En route, the Craig folks monitored us northerners for signs of "clearcut depression," a malady that strikes most outsiders getting their first big dose of Prince of Wales. From Thorne Bay, we took newly connected logging roads ("if you can't drive there yet, wait a week...") along Clarence Strait to Coffman Cave, thence southwest to the Hatchery Creek bridge, the launching point for the Honker Divide canoe route.



Our timing was off. We began after a month of some of the driest weather on record. Water levels were nearly as low as they get. The Forest Service route description advises that canoeists "wait for rain." We lacked that luxury, and started somewhat apprehensively up Hatchery Creek.

Soon we had to stop paddling and instead dragged the loaded canoes up dewatered rapids, with merganser broods fluttering ahead. A daunting stretch, but that first day's pull between Hatchery and Butterfly lakes turned out to be the hardest part of the trip. Plenty more dragging awaited us on the Thorne River, but no great ordeal. It was kind of fun actually, to splash along in shorts and sockless tennies, boats bumping behind. On lakes and the deeper stream reaches we floated silently, and often surprised deer. I've never seen so many deer in summer below the subalpine.

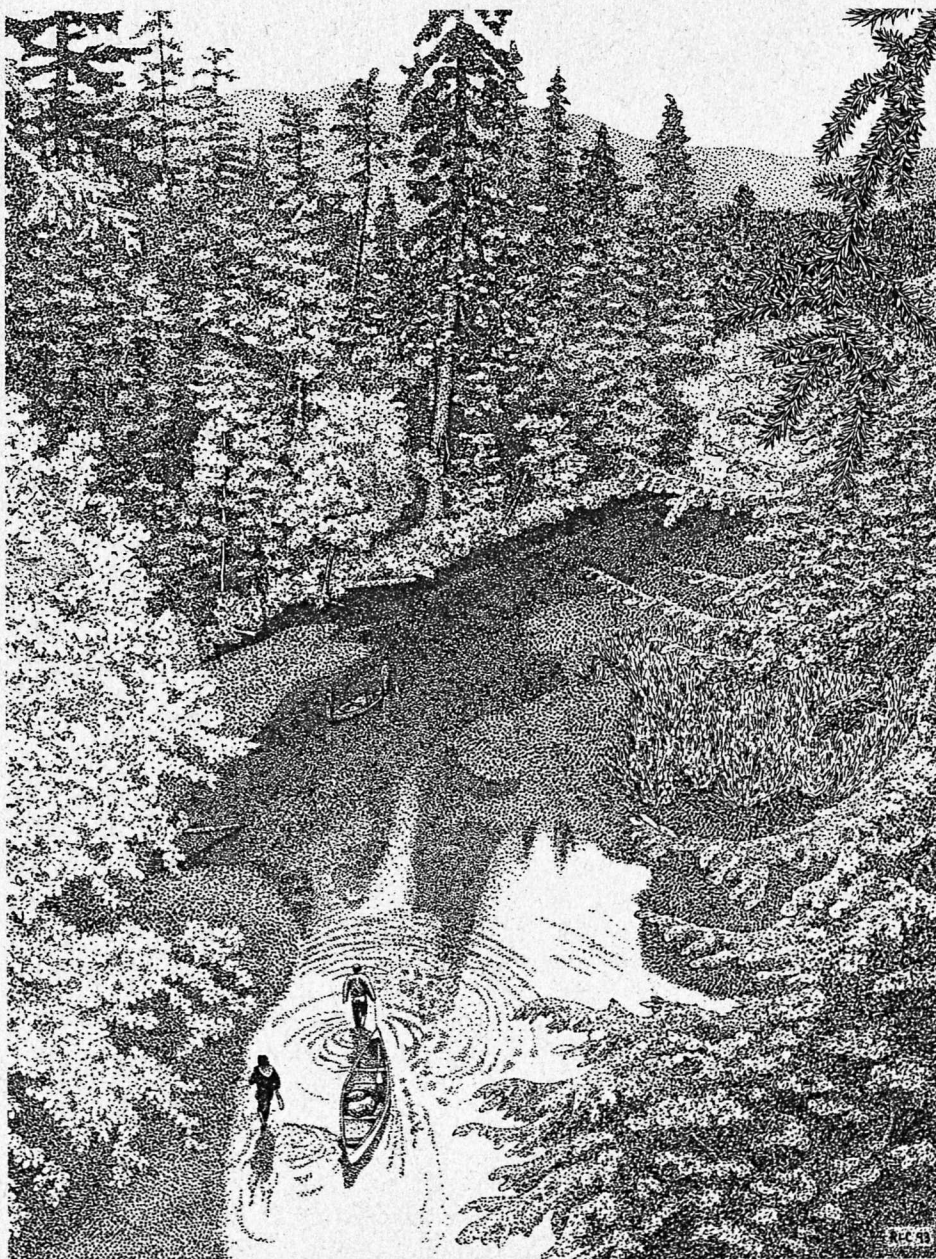
Before the trip, I'd scanned the range maps in Eric Hultén's *Flora of Alaska*, and listed plants barely reaching southern Southeast, to prepare myself for unfamiliar species: Salal, Pacific Yew (of recent cancer research fame), Black Hawthorn, Western Red-cedar, Twinflower Honey-

suckle ("ravensberry" to the Haida), Pacific Ninebark, Pygmy Waterlily, Douglas Spirea, Swamp Hedgenettle, and Northern Bugleweed. Coast Clover, a tideland and riverflat native, just straggles over the Alaskan border, but was a key root crop for coastal peoples to the south.

The plant illustrations helped tune my eyes, but couldn't foretell the *richness*. Prince of Wales vegetation is more than Juneau plus a sprinkling of southern plants. It's a floral free-for-all. Scent of crushed mint engulfed us as we dragged over Beaver dams. Gardens of columbine, lupine, Douglas Spirea and strange lilac-anthered Menzies Burnetts dangled from slough banks. Our paddles tangled in bladderworts, an insectivorous aquatic plant I'd sought fruitlessly in northern Southeast for 16 years. Surprises which had escaped my rush through Hultén lurked on portage and camp fringe. Twinflowers climbed over Mink-splintered swan bones. The improbable Round-leaved Bog Orchid is not of bogs at all, but a shady forest plant. An island in Twin Lake has a locally rare clubmoss whose scientific name rivets the botanist—*Lycopodium obscurum*! Waddling beneath the canoe, I lurched past three clones of Beadlilies in peak flower, which by August serve solitary berries, cobalt blue. Edible only by wolves, say the Bella Coola.

Ketchikan has 2650 growing-degree-days, compared to 1700 at Juneau Airport, and Thorne Bay probably exceeds even Ketchikan. But the plant diversity of Prince of Wales isn't simply a matter of balmier maritime climate and longer growing season. If only climate were limiting to Southeast plants, we'd see increased richness from Juneau through the ABCs (Admiralty, Baranof, Chichagof

Islands), which are southward and seaward, with milder winters and earlier spring. Instead, plant richness *declines* from Juneau to the ABCs. Highbush Cranberry, strawberry and wil-



On the upper Thorne River, Honker Divide by Richard Carstensen

low are common on the mainland, but rare on the islands. The extreme in this progression is western Chichagof, where even blueberry and Devil's Club sprawl marooned atop root wads and cliff faces. Plant distribution has many influences, but one cause of this seaward decline is obvious: Sitka Black-tailed Deer. Naturally lacking predators on these islands, and unchecked by truly severe winters since the early 1970s, the proliferating deer of the ABCs are hungry sculptors of their habitat, and may even chew the less tolerant plants to local extinction.

Less so, apparently, on Honker Divide. Yet deer seem plentiful here! How can Honker's wealth of plants endure the teeth of all these deer, who high-step into cover on every third river bend, ribs still outlined by winter's austerity? My first guess is that deer numbers must be lower than our sightings suggest. Let's tease apart the wolf scat on this Beaver landing, to see what's inside the wad of winter deer hair...

Ah... A toe bone! And a sliver of black hoof. This Gray Wolf claimed every last piece of its annual 20-to-30-deer allotment. While deer of the wolfless ABC islands often starve in a stripped understorey, Honker's deer die more swiftly. Populations are held below carrying capacity. Thus the flourishing of vegetation, and, at least at this point in the predation seesaw, a win-win situation for wolves, plants, and deer. Thanks to sweet soils (western portions of the watershed overlie limestone), long-summer salad-bowl meadows, world-class winter old-growth habitat, and wolves, Honker Divide grows some of the biggest deer in Southeast Alaska.

For wolves, The Honker provides a last bastion of security from hunters and trappers, who mostly work the logging roads and beaches. Radio telemetry studies by Dave Persons of the University of Alaska, Fairbanks, show a startling 50% annual mortality among Prince of Wales wolves. Pack structure and den locations are continually disrupted. Only the Honker pack's den remained in use throughout the three-year study period.

We made our last camp near the tiny Crist Kolby cabin on the Thorne River. Two mossy skulls of family-sized bucks lay by the door. One had heavy, palmated antlers, almost Moose-like, with extremely tubercled bases, a prime 5 or 6 year old. I'd always claimed relief that Admiralty Island, my usual hunting ground, lacked wolves. But as I hefted this Thorne River rack, my taste in wild land edged one more notch toward maturity.

Crist Kolby was a trapper who died mysteriously on upper Thorne Lake in March 1939. The party who found his remains eight months later

claimed that all bones but the skull "were chewed and broken." They excitedly concluded that "here at last, was a clear case of a man having been attacked and devoured by wolves." (W.R. Selfridge, *Alaskan Sportsman*, April 1943) But scavenging does not equal predation. I favor the thin-ice hypothesis. An animal who swallows deer feet, hungry enough to gnaw on Kolby's tanned-leather holster, would find it hard in late winter to pass by a beached body.

Still, Kolby, whether killed or drowned, does seem to have joined an increasingly elite group, those who have fueled the chorus of wolves. We of the non-elite, likelier to feed worms, can at least attend the concert (and fortify our plant lists) on a bracing canoe-drag through the bones and flowers of Honker Divide. ■

Richard Carstensen is a free-lance naturalist and 19 year resident of Southeast Alaska. He is coauthor and illustrator of The Nature of Southeast Alaska, Alaska Northwest Books, 1992, and Alaskan contributor to Enduring Forests (Ruth Kirk ed., The Mountaineers, in press).

Clearcut logging looms over the future of the Honker Divide. The Control Lake Timber Sale proposes to open up the Honker to roads and clearcutting in order to fulfill Ketchikan Pulp Company's 50-year timber contract. The only one of its kind in the country, this contract allows KPC (a wholly-owned subsidiary of Louisiana-Pacific and a convicted felon for dumping toxic sludge into Southeast Alaskan waters) to pay highly subsidized rates for old-growth trees. It's too late to comment on the Control Lake sale, but the Tongass Land Management Plan's (TLMP) Revised DEIS should be out soon. You can comment on TLMP by writing to 8465 Old Dairy Road, Juneau, AK 99801. Tell the Forest Service that the Honker Divide should be protected from logging under TLMP. Also contact your senators and representative in Congress; tell them you want the Honker Divide's Thorne River and Hatchery Creek designated as National Wild and Scenic Rivers to protect them from clearcut logging. Urge them to stop efforts by Alaska's congressional delegation and the timber industry to increase logging on the Tongass, North America's largest remaining temperate rainforest.

To learn more about logging on the Tongass National Forest, contact the Southeast Alaska Conservation Council at 907-586-6942 or by e-mail at seacc@alaska.net or check out SEACC's home page at <http://www.juneau.com/seacc/> or write SEACC, 419 Sixth St., Suite 328, Juneau, AK 99801.

Facing East



by Glendon Brunk

It was during those few suffering hot days in July, when mosquitoes take to the air in dark clouds so thick and insistent that they drive living things insane, that the Caribou came. They appeared suddenly, first a line of brown velvet antlers moving far off through the heat waves, like some daunting apparition. Then they took form, maybe ten or maybe a thousand, moving quickly, determined, driven to the edge of panic by the bugs.

If I was on the ball, not lost in some far off fantasy, I snapped to attention, grabbed my binoculars and the four-finger hand counter, and began clicking numbers. Index finger, bulls. Middle finger, dry cows. Third finger, cows with calves. Little finger, yearlings and sex undetermined. They always came too fast. Stay calm, I'd tell myself; the sure way to blow a count is to panic. Also keep in mind vehicles on the road. Vehicles always make the difference.

The Caribou were heading for the cooler, windier, mosquito-free shores of the Arctic Ocean that lay just a few miles to the north. This response to insects is a migration pattern that has gone on for as long as there have been Caribou in the Arctic. But times have changed. Now their migration in certain places is hindered by a maze of pipelines and roads.

I would watch them cross the outer fringes of my study area, note the time, and check for vehicles on the road. Too often, the same maddening scenario would then develop. The Caribou closed in on the pipeline. A couple hundred feet away the lead animal, usually a roman-nosed old cow, would throw up her head and stop. The others would immediately halt behind her, begin milling, shaking heads, twitching hides and tails, battling the mosquitoes.

The lead cow would advance cautiously toward the pipe, nose held high in the air, like a bird dog on fresh scent. She would stop again, clearly mystified by this odd form looming over the tundra. And then a pick-up truck or a belly dump or some other piece of heavy equipment would approach noisily on the road. The old cow would turn, begin paralleling the pipe, the others following her closely. The vehicle would blast by in a cloud of dust, more often than not with its horn blaring. The herd would panic, turning as one, running wide-eyed, nostrils flared, stampeding back toward the horizon from which they had first appeared minutes earlier.

What I remember most is the anger, the frustration I felt, when I watched the Caribou fail at crossing. Each day the anger built and seemed to have no place to go. So many times I stood tense and hopeful, only to watch the same scenario unfold, feeling their defeat as the animals turned away. And with it I felt a much larger defeat, the lunacy of this clumsy, arrogant game we moderns play with the natural world.

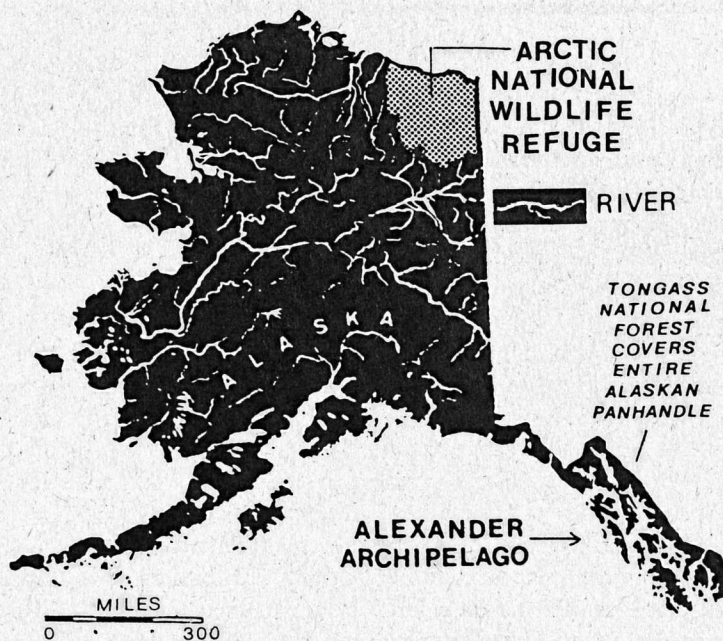
illustration by Peggy Sue McRae

I LIKE CARIBOU. Ironically, I have ever since I killed my first one years ago in Alaska. Not that I hunt anymore. No, years of blood-letting, and watching the planet I love deteriorate in every way, have brought me to a place where most modern justifications for hunting ring false. What I'm left with is a fascination for an amazing animal. Caribou live and thrive by the thousands in one of the harshest environments imaginable. Winters are beyond mean, with twenty-four hour a day darkness, punishing winds, and temperatures diving down to fifty, sixty, seventy below zero, not counting wind chill. Summers offer no relief. Mid June to the end of July, temperatures can range up into the eighties, but these months are dominated by parasitic insects. Mosquitoes are just the beginning. Next come the bot flies: stout, hairy buggers that inject live larvae up a Caribou's nose. Bot fly larvae then migrate through the nasal passages and into the back of the throat, where they grow to eventually be hacked out by their host. If the bots aren't bad enough, there are warble flies that lay eggs on the Caribou's legs. The warble fly hatchlings burrow through the skin and migrate upward subcutaneously to the back. There they bore breathing holes through the skin, and grow to the size of BBs. In the spring the larvae emerge painfully (for the Caribou) through the skin, eventually to pupate on the ground.

During fly season, Caribou stand spraddle legged, heads down, listening for a fly's approach. When one comes, a single fly, whole herds will run off wildly across the tundra. Add to all this misery the large predators—Gray Wolves, Grizzly Bears, Wolverines, humans—and there are not two weeks a year that Caribou live any kind of easy, comfortable existence. Yet, given a chance, they can thrive in the Arctic.

I like Caribou also because of their restlessness; Caribou are travelers by nature. I can relate. I'm a traveler. It seems right to me somehow that my own restless journeys were at one time financed by observing some of the most compulsive wanderers on the planet. The Caribou studies I participated in were funded by major oil companies, which at that time were mandated by law each year to spend a certain amount on environmental impact analysis. I took their money; oil development paid for my journeys. Paradoxically, oil money also helped me begin to see in a new way.

MY WOODEN observation tower sat lonely out on the tundra, at the southern edge of the oil fields. I entered it via a wooden ladder propped beneath, then popped up inside like a gopher, through a trap-door set in the middle of the floor. The view south through



the plexiglas windows was of tundra spreading endlessly in all directions, a dull green, polygonally patterned plain (a physical feature of permafrost tundra), pocked with countless small, black lakes. On the perimeters of the lakes, waterfowl still nested—Black Brant, Tundra Swans, and Pintail Ducks—migratory species themselves. On the drier ground, amid stunted willows, Golden and Black-bellied Plovers and Lapland Longspurs hid nests from the relentless predation of jaegers. Occasionally, an Arctic Fox wandered by, or a Snowy Owl floated past like a winged ghost. On still days, I could hear the plaintive cry of a Yellow-billed Loon above the sounds on the road. Far out across the tundra it called, signaling like a prophet.

North of my tower, I had a different view. The North Slope oil development, or "The Slope" as it's called by locals, is the largest contiguous industrial development on Earth, several hundred square miles, a maze of roads and pipes and production facilities. Let the oil companies say what they will about how carefully they've developed the Arctic. The bottom line is *petroleum production is a toxic, destructive, go-for-broke business, dedicated to one thing only: excessive profits*, billions and billions of dollars taken at the expense of the earth.

Alaska's North Slope tells the whole tale of it. Toxic waste bubbles in settling ponds and seeps into nearby lakes. Huge holes dot the land, where billions of yards of gravel have been mined. Every turn of the horizon is broken by the works of man: drilling platforms, radio towers, transmission lines, pipelines, camp buildings, oil wells, refinery stacks. There's something surreal about it, a space odyssey quality that confuses the mind, something oddly beautiful yet at the same time repulsively ugly. Being an observer of wildlife there, observing living things juxtaposed against everything that seems their antithesis, is a schizoid experience.

MY PART IN THE CARIBOU studies was not glamorous, just interminable hours and days of waiting, and of scanning an often empty tundra plain with my binoculars. There were only my idle thoughts to keep me company, thoughts of women met along the way, of journeys taken, and others yet to be taken. Behind it all was the ceaseless blowing of the north wind, careening off the tundra, rattling and shaking the tower so hard at times I thought it might tear the guy wires out of the frozen earth, and I would lift off and sail away over the white expanse of the ocean, like some reluctant space traveler.

In time the north wind becomes part of your subconscious. But then one day it suddenly dies, and the world becomes loud with its disappearance. That is the moment of summer beginning, when the Arctic yields to the punishing heat of an around-the-clock sun. The tundra world becomes an angry, buzzing mop of mosquitoes and flies, a guarantee that Caribou will soon appear somewhere on the coastal plain.

If Caribou appeared within view of my tower, I was to count their numbers, map their movements, and note their reactions to the elevated pipeline and the road adjacent to it. "Success rates crossing pipelines" was the scientific jargon, as if Caribou were competing for something.

Over the course of the three summer seasons that I participated in the studies, my colleagues and I noted these things: Gravel ramps, built over lowered sections of the pipelines as crossing devices, fail miserably. When confronted with any obstacle foreign to several thousand years of Arctic experience, Caribou in numbers usually become confused and retreat. Given enough time, though, some will eventually figure it out and begin to cross under the pipelines (usually four to six feet off the ground) or over the ramps and the roads adjacent to the pipelines. The bulls will duck their heads in an exaggerated way, careful of their massive antlers, and then quickly shuttle under. But trucks and machinery on the roads—"vehicle interactions" we called them—will almost always foil any attempt. Bulls and dry cows clearly get through the oil fields more easily than cows with calves; cows with calves rarely succeed, even with no traffic on the roads. A few bulls do adapt to the oil fields, in fact seem to prefer them, most likely because of the lack of predators.

My colleagues and I did *not* note (or more accurately, *record*) the confusion, the white-eyed panic, the separation of cows from calves when pipelines and roads with traffic were encountered. We did not record the casual attitudes of the workers in the oil fields, their disinterest or even outright disdain for living things. We did not record the Caribou's beauty, their comic grace, the miracles of minute ecological adaptations that allow them to thrive in a punishing environment. Nor did we record the frustration we felt, the anger.

All that we recorded was what we were allowed to within the parameters of the study. We generated "data" to be run through the mathematical hieroglyphics of computer models, data that was then spit out as statistics, graphs, charts, and tech-

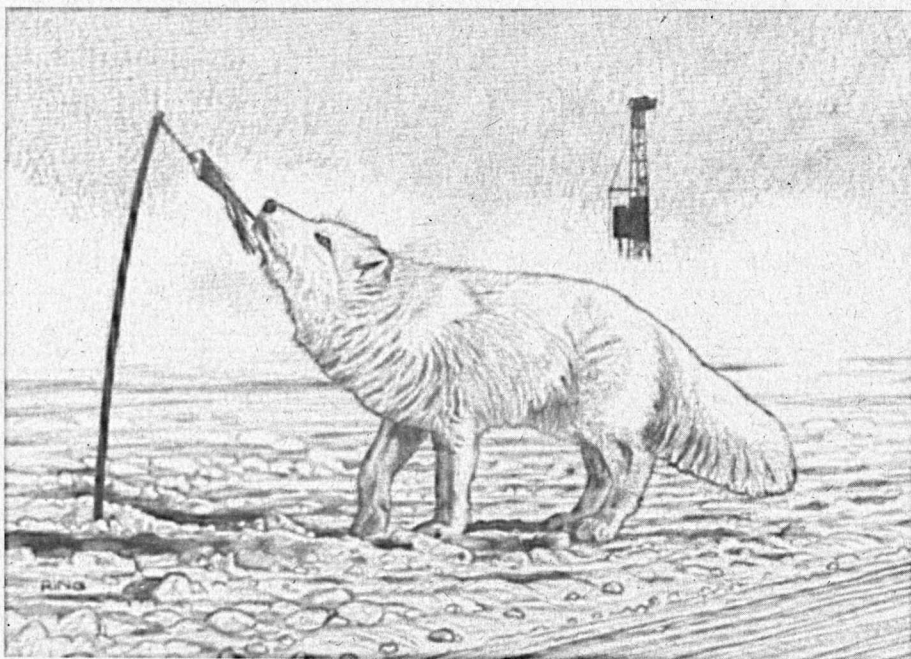
nological language devoid of any smells, colors or feelings, all to be thickly bound in a report to gather dust on desks in Fairbanks, Anchorage, and Houston. Somewhere early on in the process, at the tip of my own pencil, Caribou quit being living things, with all the miraculous interactions of any species, and became an abstract idea.

I recall the frustration of being bound by those parameters. I wanted other people to feel what I felt, to observe what I observed. I wanted them to know what it was like to see the Arctic change so rapidly, to have seen this same tundra world before development. To have seen it wild and unscarred, and then a few short years later to see the heart torn from it. When I expressed my concern to one of my colleagues, he reminded me that scientists pride themselves on being detached, on being objective. "You can't care about these animals and do the work," he said. He was the same one who called Caribou "tundra maggots," referring, I guess, to their numbers and the way a large herd on the move seems to squirm in the distance.

Too many research biologists in the oil fields go numb, resistant to feeling. The reductionist nature of the "science" we practiced, the crush of bureaucratic and corporate demands, seeing over and over again the destruction of wild places and wildlife, all these things divorced us from our feelings. I know, though, beneath it all most of us cared. Almost all the field biologists I have ever known are people who began their careers with a keen appreciation of the wild. I can honestly say that the consulting company I worked for was as reputable as they get, committed to good science, at least good science as required by the extractive industry. I know, too, that most of us working there were uncomfortable at some level with what we were doing. But our reasoning went, if we don't do this study, some other, less ethical consulting company will. At least we'll do it the best that it can be done. And beneath that reasoning was one ever insistent practicality: we all needed to make a living.

Yes, so much of life is justified by the dual rationalizations of inevitability and economics. All of us working there gave away something important in ourselves when we sold ourselves to the oil corporations. Something died in all of us, some deep part, some vital idealism and passion that feeds the soul and gives us cause for full living.

When souls are not engaged, wildlife biology (or any science) becomes an exercise dominated by technicians, computer-model addicts, people who have bought the notion that scientific practice is supposed to be value-free. The old-time naturalist/biologist is for the most part missing today (or ignored), those men and women who dedicated their whole lives to understanding intimately a place and the interrelationships of living things in that place. The patience and deep caring of that kind of observation are missing. Everything is speeded up today, computerized, depersonalized, abstracted. Too much biology has become the questionable science of risk assessment, an exercise dedicated to answer only this question: how far can we push a species with our industrial activities before it will fail entirely?



On the North Slope we took the science of abstraction and risk assessment to a new level; we studied Caribou knowing full well that nothing would change in the oil fields if our study suggested harm to Caribou populations. Our only intent with the study was to document what was already underway, to blanket with statistical jargon what any reasonable person could see was a growing disaster for wildlife and for what was once a wild place. It was already well documented that cows had ceased calving in a major portion of their traditional calving areas because of human activities. This displacement was concentrating the cows into smaller areas, thus depleting nutrition sorely needed for calving. Speculation was that calves were being born weaker, making them more susceptible to mosquitoes and other stresses. It didn't take a science degree to figure out that cutting off access to mosquito relief habitat added another complication to an already highly complicated existence. The effects could not be easily proven with a tidy, short-term study. All that was needed to see it, though, was a dollop of common sense. All it took was a willingness to look honestly, an openness to feeling.

One of the oil companies operating on the North Slope used to run an ad in national magazines with a glossy colored photo of some massively antlered bull Caribou grazing contentedly by an oil rig. The text went something like this: "Working to protect our environment while providing for America's future." This catchy slogan used to turn me livid. I knew the truth. I wondered, why don't scientists speak up, go public, tell people what's really going on up in the Arctic?

BY MY THIRD season in the oil fields I was beginning to realize that I was in the wrong place, working in the wrong business. Each day I sat in my tower and fantasized about walking east. I saw myself walking quickly, leaving the oil fields behind. I walked effortlessly through the jumble of rivers and lakes, fifty miles east, until I came to the broad, braided delta of the Canning River. Beyond the Canning was country completely devoid of oil structures, country untouched and primal, wild enough to yield what my overly civilized soul yearned to feel again. Beyond the Canning lies an area the size of Maine that government bodies have designated the Arctic National Wildlife Refuge, one of the last truly wild places on the planet. Within the boundaries of the Refuge, the Brooks Range, wildest

mountains in North America, curves north and comes within miles of the Arctic Ocean. This mix of mountains, coastal plain, and ocean makes for a unique ecosystem, superb Arctic wildlife habitat. A hundred and fifty thousand Caribou annually migrate unhindered across the Refuge. Wolves still roam hungry-eyed. Grizzlies and Wolverines prowl the hillsides in search of food. In the fall, Snow Geese by the thousands stage out on the coastal plain for their flight south. It's an easy place to love. I have since my first visit there, twenty-seven years ago.

But why get all misty eyed over some "empty wasteland" as one politician from Alaska called the Refuge? In response, I'd suggest that loving a place is a big part of what life is about. One of those frustrating paradoxes of our modern humanness is that we seem to deny, fear and resist, even destroy, what we most yearn to experience. One of the ways we avoid feeling for a place is by staying on the move. We Americans (and I include myself) are perhaps the world's most restless people. We migrate, not like nomads following seasons and food, but because we are unhappy, because we seek something outside ourselves, something that can never be found. We resist learning to love a place, a landscape, resist risking that much intimacy with something so powerful, because doing so might mean we have to stay and take a stand. Government policies support such transience and detachment. The managers of National Parks, Wildlife Refuges, and Forests are routinely transferred every few years, to keep them from caring about a place too much. Loving a place, in the industrial/political mindset, is a sign of weakness, a tragic flaw. Caring about Caribou is sheer nonsense, gushing sentimentality.

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Once, a few years back, while visiting Washington DC, I had lunch with a veteran environmental lobbyist. He was a pleasant guy, balding and spreading soft in the middle. In the course of our conversation he admitted he didn't feel comfortable being far away from civilization. "I like my amenities," he said. "I'm more a theorist than I am a naturalist. I just know it makes good sense to protect the planet, so I've made a career of it."

"How do you get up for it each day," I asked him, "without feeling some passion for the wild?"

He looked me straight in the eye. "When you lobby these politicians, passion's got nothing to do with it. You come here and these guys see you care too much, they'll discount whatever it is you have to say. My advice, keep feelings out of it."

I let it go at that, even though I wanted to pontificate a bit and suggest that buying into the other guys' game only adds to the problem. But I couldn't judge his motives; he was involved, doing what he thought he should. If I understood his reasoning, though, the idea is to approach everything as pragmatically as possible. Leave out the feelings, because feelings won't sway the policy makers or pay the bills.

I get stumped here. How do I say what I want to say, tie the notion of caring for a place into the way some people think? How can I not sound like some emotionally overwrought tree-hugger? It's the challenge of trying to describe something outside too many people's experience.

How long can we keep fooling ourselves? Our migrations are fueled, literally, with oil. The ultimate irony is that in the quest for and conquest of oil, we willingly destroy thousands of years of migratory evolution, all to keep ourselves moving at this desperate pace for just a few more years. A case in point is the mean estimate of the amount of oil that might be found in the Arctic Refuge. If it were our only source, it would last the United States six months. What price are we willing to pay to keep the illusion of our progress alive, to avoid *feeling* the truth of our tenuous existence?

AUTUMN COMES to the Arctic in a rush. One day the tundra is green and the next it's a palette of colors: reds and rusts and muted yellows. Newly feathered waterfowl begin to test their wings, restless, pushed by an inner whispering that warns of the hard hand of winter that will soon hold this place.

In my tower I could hear the same whispering. My third field season was drawing to a close; one journey ending and another uncertain one about to begin.

It was well past midnight, yet the sun was still alive, a tepid orange orb set low on the northern horizon. The sun cast a diffused, yellow light over the tundra, a gentler touch than the pale, angled glare of daytime.

I borrowed a pick-up, and drove over gravel roads, through a maze of silver pipelines, the capillaries, veins, arteries of the giant. I passed dozens of well pads, with rows of metal sheathed pump houses standing like space age knights in revue; and refineries with gas flares pulsing red into the night sky; and portable drilling rigs, set on newly laid gravel pads, far out on the tundra, towering ten stories high, aliens in a world where the tallest plant might make a foot. I passed equipment yards with



rows of Cats and graders and belly dumps; and construction camps, with lines of portable housing units connected in close rectangular patterns; and the ordered sprawl of a main operation camp, this one famed for an Olympic sized swimming pool, full gym, and a tropical garden inside.

I drove northeast until I came to the Arctic Ocean. There I pulled to the side of the road and parked. For most of the year the Arctic Ocean is ice-bound, covered beyond imagination with a solid white armor. Summer, though, the winds shift from the northwest to the southeast. By August the sun has weakened the ice enough that the winds can push it off-shore. It lies far out to the north then, a shimmering mirage, a refracted white band of light against the darker curve of the sky.

The Arctic Ocean is for the most part a hostile, crushing environment. Unfortunately, this does not deter the petroleum industry. Beyond my parking spot, a two mile gravel causeway jutted like a long finger out into the ocean, connecting the mainland with an artificial island that hosts another major production facility. That fall, Arctic Char, migratory fish the local Inuits had depended upon for centuries, mysteriously failed to show up in normal numbers in the rivers east of the causeway. State biologists speculated that the causeway had short-circuited ocean currents, confusing the fish's navigational patterns. Some Inuits were saying the same was happening to the Bowhead Whale.

Closer to shore, a natural island hosts one of the few nesting colonies of Snow Geese on Alaska's north coast. Shortly after the goslings hatch, the adult geese swim ashore with them, intent upon walking inland to feed on vegetation lusher than the island provides. The adult geese are extremely wary, noticeably sensitive to any intrusion, protective of their young. The biologists observing the geese that summer noted that for the most part the geese' migration was thwarted by traffic on the new causeway road. It was easy to guess what this would likely mean for the long-term health of the colony.

I shouldered a small pack and began walking quickly east. I waded shallow braids of the Sagavanirktok River, then gained the narrow beach along the deceptively placid Arctic Ocean. The beach, a slaty gray interface between the tundra world and the ocean, was littered with chunks of styrofoam and soda cans, survey stakes topped with tags of red ribbon, frayed lengths of rope, and the ever present symbol of modern man in the north: rusted, fifty-five gallon drums.

I walked, zig-zagging from the beach out onto the tundra, skirting ponds and small lakes, then back to the beach again. Along the way I spotted an Arctic Fox busily investigating a colony of Arctic Ground Squirrels, a Snowy Owl perched motionless on its hunting mound, and out over the ocean, the white-on-black flash of King Eiders in flight. I must have walked an hour or so before I came to the banks of a black tundra creek, too wide and deep at its mouth to cross.

At least I was out of the oil fields. I turned south and stared out over the tundra, the coastal plain that some call barren. In the distance, eighty miles at least, the peaks of the Brooks Range caught the early morning light. Somewhere in those mountains, a new road crossed a high pass, connecting the oil fields with the rest of the world. Its construction in the 1970s had speeded up time on the coastal plain, had brought the plain square and immediately into the twentieth century.

I stood still and let the sounds of the tundra take over. Close by I could hear the whistled *chu-leet* of a Golden Plover, and somewhere in the distance, the cry of an Arctic Loon. I felt the wind gather itself, watched it touch the tundra, bend stands of Cotton Grass, ruffle the surface of ponds.

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I faced east again. I thought of my fantasy of walking to the Arctic Refuge. I knew that the oil companies, speculating on paying quantities of petroleum in the Refuge, were spending millions on a public relations effort to get permission from the federal government to develop there. It struck me then that I stood at a place on the planet that symbolically focused so many of our modern dilemmas. I stood at the north edge of the world, one of the last places to exploit. To the south, far beyond the Brooks Range, millions of North Americans were demanding more of everything, more goods, more oil, and ironically, more wild places to escape to. West of where I stood, the oil fields were witness to what we've been up to for over three centuries now, the ill-conceived notion of frontier, of resources unlimited, the unquestioned righteousness and possibilities of industrial technology. And to the east, in stark contrast, there survived a remnant of unaltered nature, the priceless remains of a former world, the path back to something our de-natured souls yearn for. I stood at the interface of choice. Will we modern humans continue to deface the world in order to perpetuate our illusion of progress? Or can we begin to face another direction, begin to make the hard choices of living here in a radically new way?

As I stood there I also realized that I had to ask myself the same questions. I saw my part in the scarring of Alaska, not an active part particularly, more one of a compliance by silence. I grew angry when I thought of oil development in the Arctic Refuge, but what was I doing about it? How was I—with my participation in the oil fields, my assumptions and consumptions—different from or more righteous than the executive who signed my pay check? What was I doing to guarantee wild places for generations to come?

The sun was climbing the east flank of its orbit, casting a new, harsher quality of light across the tundra. I made a decision: this would be my last season in the oil fields. I would begin to follow another voice, whatever it asked, wherever it took me.

I stood there a while longer, facing east, feeling the first edges of a new freedom, a release from some long confinement. I turned, and began walking back to the pickup. Ahead, far off over the coastal plain, a giant plume of black smoke, a flare-off in the oil fields, trailed northward across the sky. ■

Glendon Brunk lived in Alaska for twenty-two years, homesteading in the bush for twelve of those. He also worked as a wildlife research biologist, scientific expedition outfitter, wilderness guide, and professional dog musher (winning the World Championship of Sprint Racing in 1980). Recently he completed two graduate degrees at the University of Montana, in Creative Writing and Environmental Studies. He presently lives and writes in Missoula, MT (but hopes soon to be teaching at the college level, somewhere warm and sunny).

EPILOGUE: My decision to quit the oil fields and follow another voice led to the production of *The Last Great Wilderness*, a multimedia slide show about the Arctic National Wildlife Refuge and the dismal reality of petroleum development in the Arctic. Along with a number of other activists, I traveled with the show for three years (1989-91), all over the country, presenting hundreds of shows for thousands of people. Through the efforts of many dedicated people across America, the Arctic Refuge has several times now been rescued from the brink of destruction.

Today, though, with the Republican Congress, and key committee chairs filled by rabidly pro-development senior politicians from Alaska, the Arctic Refuge is threatened more than ever. The Republican-sponsored budget bill includes projected revenues from Refuge development. If this bill were to pass the President's desk, it would mean development of the coastal plain of the Refuge.

Fortunately, President Clinton, influenced by Al Gore, has thus far stood firm for Arctic Refuge, saying that development language does not belong in any budget bill. But this is a shaky stand-off at best; the forces that would develop are still pushing.

The best that can be said at this point is that the longer the budget bill remains stuck in Congress, the greater the chances that no vital decision will be made until after the next election.

Environmental groups have celebrated what appears to be another temporary reprieve for the Refuge. We are still, though, a long way from Wilderness status. Now, more than ever, Americans need to tell the President they support his stand for Arctic Refuge (202-456-1111 or e-mail, president@whitehouse.gov). Also key is the defeat of pro-development members of Congress.



illustration by Ann Young

The White Ash *Fraxinus americana*

by Robert Leverett
illustrations by Heather Lenz

FOREST CONNECTIONS

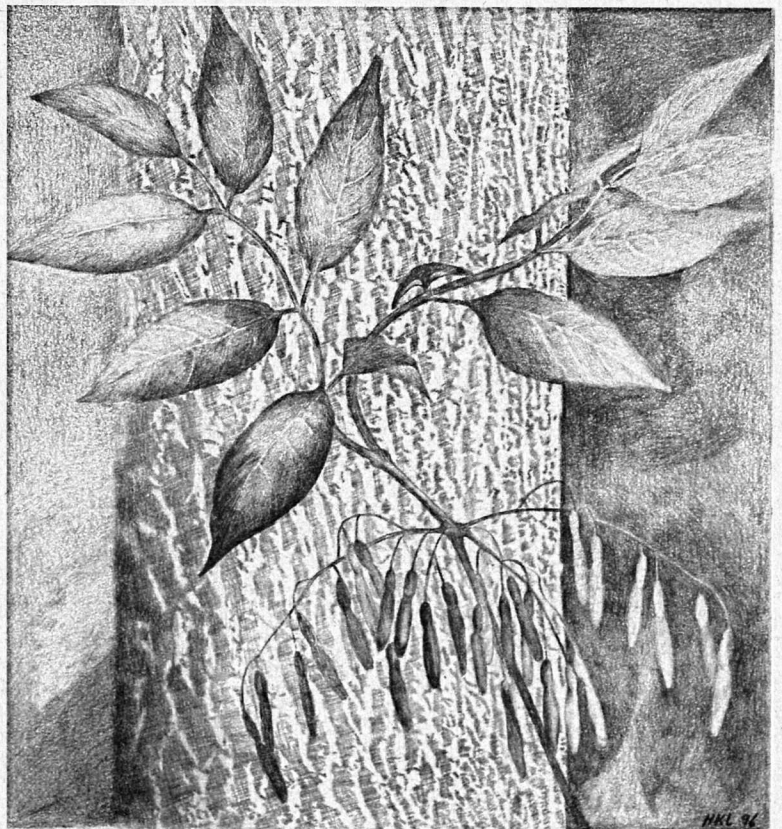
Sometimes when I am alone, my thoughts drift back to childhood associations with trees and forests. When did I become aware of a particular tree or of trees in a family or species sense? When did the forest beckon me to enter its veil of green? These reflections receive nourishment from conversations with my good friend Dr. Michael Perlman. Mike's exploration of the psychological impact of trees is reshaping my thinking about bonds between humans and trees. Mike's work has great potential to promote the very health of our species.

My reflections are often triggered by vivid childhood memories of trees I climbed, swung from, gathered nuts beneath, and hid behind. An odd combination of sycamores, princess trees, and Spanish oaks held my attention, along with a White Pine and a Tulip Tree in a neighbor's yard. These latter two trees were the young lords of the neighborhood. Also affecting me was my first trip to the Smoky Mountains.

Perhaps one day, I'll understand how this assortment of species helped to mold my tree-awareness. What I am absolutely sure of is that I never once thought of any of my childhood tree friends in a commercial sense. The creator had not breathed life into my woody companions in preparation for ignominious ends as toothpicks, chopsticks, lawn furniture and junk mail, hallmark of our wasteful society. I do recall being privy to the conversations of adults on the utilitarian value of particular tree species, such as the chestnut; but the occasional eavesdropping of a curious child built no storehouse of knowledge on the uses of wood. It took the sport of baseball to change that.

As an aspiring baseball player, I was introduced to the fine qualities of the ash. Its remarkably resilient wood entered my thinking in an athletic context but then gradually dropped out. I am pleased to say that *Fraxinus americana* is back and in a far more satisfying way than my pitiful batting average would ever have allowed. For in the view of many tree lovers, myself included, the White Ash is one of our noblest trees.

As we explore the White Ash, an ancillary objective of this article will be to reveal how this graceful tree has entered the thinking of others, in particular the authors of tree guides. This is my meager contribution in support of Mike Perlman's work.



leaves and seeds of White Ash, showing younger bark

In most cases *Fraxinus americana* enters the printed media conventionally, as one from a standard list of species. Sometimes, the ash is inexplicably omitted. The November 1955 issue of *National Geographic* contains an article entitled "Wealth and Wonder of Northern State Trees." The author, William Dayton of the United States Forest Service, includes maples, birches, oaks, hemlocks, pines, and less widespread species such as the Ohio Buckeye; but the ashes are conspicuously absent. This is surprising, since none other than Julia Ellen Rogers stated in the 1914 edition of her elegant *The Tree Book* that the White Ash "is counted one of the most important timber trees. It is probably put to more uses than any other species." One thus assumes the ash would rate highly in the thinking of a timber specialist. Perhaps a quality versus quantity issue is involved. Others, too, have by-passed

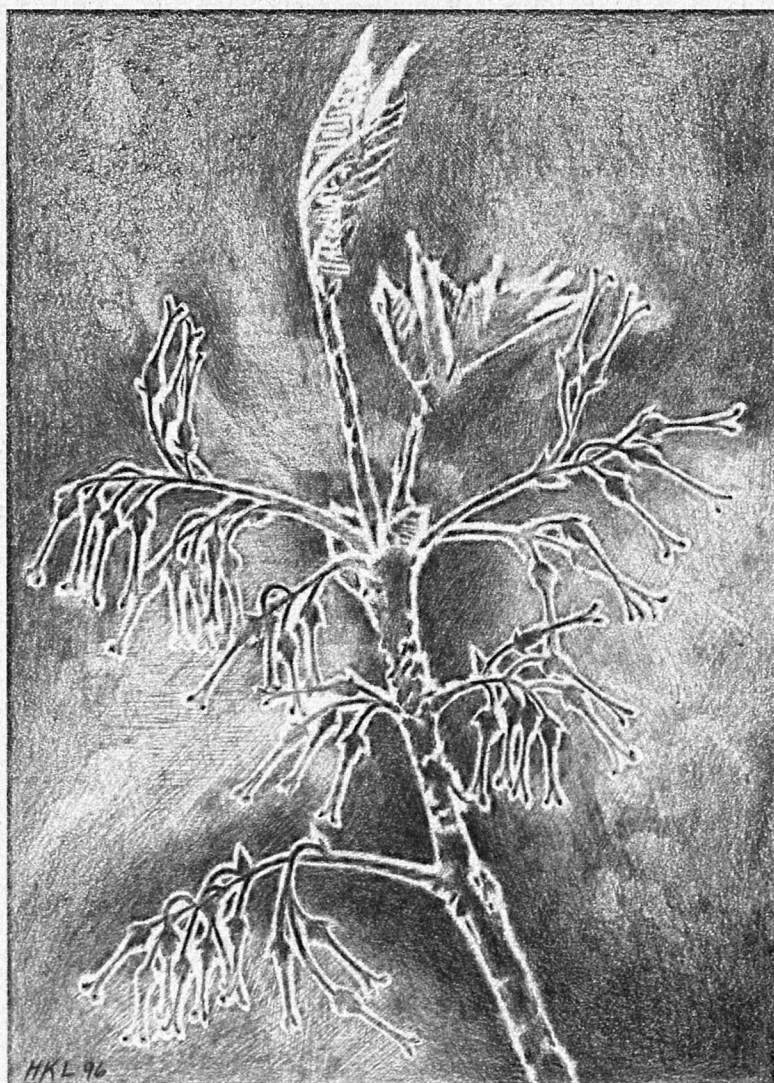
the White Ash. Even with *Fraxinus americana*'s importance to baseball, our national pastime, no state adopted the White Ash (or any ash) as its state tree. Though commercially valuable, the ash seems to have kept a low profile. Let us look closer at this fascinating, prominent yet paradoxically illusive species.

THE GRACEFUL CURVES OF THE ASH

Popular descriptions of a tree species often are based on observations made in accessible locations such as yards, city parks, along roads, young regrowth woodlands, and fields. Drawings and photographs usually depict trees growing in these locations. In *A Natural History of Trees of Eastern and Central North America*, Donald Culross Peattie describes the ash as follows—"when the white ash is young it has a narrow head. But with age its boughs

widen until its crown is broader than long, if the tree is growing in the open without too severe competition, a great pool of shade results." In the *Handbook of the Trees of New England*, Lorin Dame and Henry Brooks describe the shape of the ash thus: "in open ground the trunk, separating at a height of a few feet, throws off two or three large limbs, and is soon lost amid the slender, often greatly curving branches, forming a rather open, rounded head widest at or near the base, with light and graceful foliage, and a stout, rather sparse, glabrous, and sometimes flattish spray." In *Important Timber Trees of the United States*, author Simon Elliot describes the shape of the in-forest White Ash, of greater importance to timber specialists: "when crowded from early life, it shoots upward, dropping all its lower limbs, and forms a tall stem which when it reaches its vantage-point, breaks out into a round, open crown, with a few specialized branches..."

Readers of my past articles may suspect I prefer tall, straight in-forest grown trees to those growing in the open. In truth, I am a dispassionate observer. Sometimes I want to stand beneath broad, spreading crowns and ponder the importance of large out-reaching limbs, the kind that may have provided refuge from predators for our distant ancestors. However, I confess that when it comes to the White Ash, I prefer the in-forest form. It is not so distinctive as the vase-shaped silhouette of the American Elm; but when in full leaf, the in-forest ash takes on a slightly tropical look. Its limbs sweep up in a "V" shape crowned with feathery foliage. Field-grown ashes can be beautiful, but in maturity, as limbs are lost, they often develop an ungainly appearance, as if they can't decide in which direction to invest new growth. By contrast, the in-forest ash is majestic,



pistillate, or seed-producing catkins
illustration by Heather Lenz

rivaling the best of the Tulip Poplars for soaring trunks. However, its gentle upward curving limbs are most pleasing when the ash has a little growing space. In-forest or open-grown, suffice it to say, the ash is challenging to describe.

SIZE

If authors differ in their descriptions of shape, neither do they agree on the dimensions of the ash. *A Field Guide to Trees and Shrubs* by George Petrides describes the White Ash as reaching 70 to 80 feet in height with a maximum of 100. The diameter is given as 2 to 3 feet with a maximum of 7. In *Field Book of American Trees and Shrubs*, F. Schuyler Mathews lists the trees dimensions as "60-75 and occasionally 120 feet high in woodlands of the Ohio and Mississippi Valleys with a trunk diameter of 4-6 feet." Donald Culross Peattie refers to the ashes that once grew in the virgin forest as capable of reaching 175 feet and exceeding 5 feet in diameter. Simon Elliott gives us a good description of virgin ash in Pennsylvania: "Very fine specimens were found in Pennsylvania, especially on the gentle slopes and along the streams of the Allegheny Mountains. It was there frequently seen from one hundred to one hundred twenty-five feet high and four feet in diameter, with a straight and slightly tapering stem, clean of limbs for fifty to sixty feet or more." In *The Tree Book*, Julia Ellen Rogers lists the dimensions of the ash as "75 to 125 feet height, with straight columnar trunk reaching 6 feet in diameter." In the *Handbook of the Trees of New England*, Dame and Brooks list the dimensions as "50-75 feet high with a trunk diameter of 2-3 feet."

Despite differences in descriptions, one may conclude that most authors think of the ash as a medium to large tree. The current national champion is 25.3 feet in girth; its height is listed as 95 feet and average crown spread 82 feet, for 420 points on the big tree formula. This total surpasses the champion American Beech; all birches, buckeyes, hickories, locusts, magnolias; most species of maple; and many species of oak and willow.

As readers might suspect, I have something to say about size. Over the past five years, I have measured the heights and girths of more White Ash trees than any other species, excepting White Pine and Eastern Hemlock. I still have a lot to learn about its potential. I do know that it grows exceptionally fast, an observation corroborated by others. In *The Best Loved Trees of America*, Robert Lemmon states that the ash "can reach heights of 50 feet in 30 years." Data I have accumulated suggest that on favorable sites the White Ash can sustain a growth rate of 1.5 to 2 feet per year for the first 50 to 60 years of life, then growth rates slow appreciably. Four years ago, in the Mohawk Trail

State Forest of western Massachusetts, ecologist Tad Zebryk and I measured a 68-year-old White Ash to 116 feet in height. Today the tree is nearly 125 feet tall. I am monitoring it and other trees in the area.

On favorable sites in the Northeast, the White Ash commonly reaches heights of 100 to 125 feet and diameters of 2 to 4 feet. Exemplary stands can be found in the Mohawk Trail State Forest. One stand on Clark Ridge has trees in the 120 to 130 foot height range. The largest girths are 9 to 11.5 feet. I have yet to measure an ash in the Northeast, or anywhere, that tops 140 feet, but Alan Smith, a botanist in western North Carolina, measured a downed tree in the Pisgah National Forest's Big Ivy watershed in that size class.

ASH BARK

Common descriptions of the bark of the White Ash provide insight into the limits of words to convey meaningful information. *The Complete Trees of North America—A Field Guide and Natural History*, by Thomas Alias, describes ash bark as "becoming thick, 2.5-8 cm thick, deeply fissured with broad, flat, scaly ridges, dark brown to gray." In *The Best Loved Trees of America*, Lemmon states that "Superficially, you can tell a white ash by several obvious characteristics. One is the gray-brown quite conservatively ridged and furrowed bark of the trunk." In *Field Book of American Trees and Shrubs*, F. Schuyler Mathews notes "Bark dark gray or gray brown, deeply and somewhat conventionally furrowed into short perpendicular channels and strongly confluent narrow ridges." In *A Natural History of Trees of Eastern and Central North America*, Peattie provides a very different description: "ash-gray, finely and shallowly furrowed, with innumerable narrow, flat, braided ridges." *Our Native Trees*, by Harriet Keeler, describes ash bark as "gray, deeply furrowed into narrow flattened ridges, surface scaly." *Handbook of the Trees of New England* describes ash bark as follows, "Bark of trunk in mature trees easily distinguishable at some distance by the characteristic gray color and uniform striation; ridges prominent, narrow, flattish, firm, without surface scales but with fine transverse seams; furrows fine and strong, sinuous, parallel or connecting at intervals."

To my eyes, ash bark is pale gray with a tinge of brown. The furrows are of shallow to medium depth. Old trees have the deepest furrowing. The ridges are narrow, flat, and sometimes braided or crisscrossed, giving the diamond pattern often mentioned. The ridges slough off with age, leaving a slightly papery (or scaly?) texture beneath. The ridges on young trees are hard, but age softens ash bark. The thumb pressed into young ash bark won't compress the bark at all. The bark of older trees is slightly spongy.

ASH WOOD

Ash wood is pale to medium brown. The heartwood can be fairly dark. The wood of the ash is known for its strength and pliability, but not durability when exposed to moisture. Ash wood bends into shapes that make it useful for the curved backs of chairs. Its weight has been listed as anywhere from 39 lb/cubic ft to 42 lb/cubic ft. I suspect that the wood of the slow-grown ash with a higher percentage of summer or late wood is the lighter. Some authors describe the weight of ash as medium-light, while others describe the weight as medium or even heavy, all this in a variation of 3 pounds per foot. I think of ash wood as more on the heavy side. Ash wood is very straight grained. Simon Elliot states that the wood of slow-grown old-growth specimens of White Ash is apt to be brittle. Young fast-grown ash provide the strongest and most valuable wood, making the ash something of an anomaly.

ASH LEAVES

The leaves of *Fraxinus americana* are compound, from 8 to 12 inches and rarely 16 in length, with 3 to 4 matched pairs of leaflets and a single leaflet at the tip. Individual leaflets are 3 to 5 inches long and 1 to 2 inches across. Leaf shape is usually described as ovate or oblong lanceolate.

The color of ash leaves is a dull light to dark green on top and silvery beneath. The veins underneath are often hairy. In the autumn, ash leaves go through a remarkable color transition. Wilson Flagg describes it thus in his *A Year Among the Trees*: "The colors of the ash are quite unique, and distinguish it from all other trees. Under favorable circumstances its coloring process is nearly uniform. It begins with a general impurpling of the whole mass of foliage nearly at the same time and the gradual changes remind me of those observed in sea mosses during the process of bleaching. There is an invariable succession in these tints as in the brightening beams of morn. They are first of a dark bronze, turning from this to a chocolate, then to a violet brown, and finally to a salmon color or yellow with a shade of lilac. When the leaves are faded nearly yellow, they are ready to drop from the tree.... It ought to be remembered that the gradations of autumn tints in all cases are in the order of those of sunrise, from dark to light hues..." In *Trees*, Alan Mitchell describes the autumn show of the ash more simply "from yellow, the leaves turn orange and then purplish."

Ashes are late leafing throughout most of the tree's range. Other species are well along in displaying their new spring garb as ash leaves begin to unfold. The locations of ash on a ridge populated with a mix of hardwoods are quickly revealed to the eye less by shape than by the absence of ash leaves until well into spring.

FLOWERS & FRUITS

Tree guides give conflicting information on the flowering strategy of the ash. The flowers appear in April or May from buds that exhibit scales. Males flower annually, or nearly so. Female trees flower heavily every 2 or 3 years. The calyx of the female flower is deeply lobed, while somewhat bell-shaped in the male. The greenish flowers of each sex appear on different trees, according to some authors, but can occur on the same tree, according to others. Male flowers appear in dense clusters without petals; female flowers appear in elongate, many-flowered clusters. The flowers are without petals, possessing 2 to 3 stamens, with nearly black anthers. The fruits appear in dense clusters up to 8 inches in length. The fruits are winged, oar-like and spin away from the female trees. The ash is wind pollinated.

AGE

The ash is a medium to relatively long-lived tree. It has no problem living 175 years and can live to near 300. Donald Culross Peattie states that virgin White Ash lived past 300 years. Simon Elliot places the upper age limit of the tree as 275 years. The greatest ages are achieved by the slower growing in-forest ashes. The oldest I have personally dated is a 270 year old citizen of the Dunbar Valley [see *Species Spotlight*, page 105] in the central Berkshires of Massachusetts. Another large ash in the same valley, dated by my good friend Don Bertollette of the US Forest Service, is about 240 years. Within the old-growth stands of the Massachusetts Berkshires, White Ash are in the 160 to 200 year range.

DISTRIBUTION & ECOLOGICAL NICHE

The White Ash can be found growing from Nova Scotia west to Ontario at the northern end of its range, south to northern Florida and west to eastern Texas. Its range is close to that of the Northern Red Oak, with the White Ash extending slightly farther south in the common western extreme and the Northern Red Oak extending slightly farther north to the west. The ash's fibrous root structure allows it to grow in shallow soils, but it prefers deep, rich, sweet loam, well watered but drained. Although ash seedlings can persist for a time in a closed canopy forest, the White Ash is a light-loving species. One feature helping the ash maintain itself in a closed canopy forest is its capacity to root-sprout. In *Eastern Forests*, John Kricher lists the White Ash as an indicator species of the Beech-Maple association, the Appalachian Cove Forest, and Southern Riverine Forest, and a tree of old field succession.

In *Trees, Shrubs, and Woody Vines of Great Smoky Mountains National Park*, Arthur Stupka quotes a 1905 Geological Survey paper on the Southern Appalachians by Ayres and Ashe as stating that the White Ash comprised 5 percent of the virgin forests of the Laurel Creek basin. This is about as high a percentage of ash as a constituent of old-growth forest as I am aware. In second growth, the percentage can be much higher. In second-growth areas in Maine, White Ash can occur in dense clusters over larger areas than is generally true for the rest of New England. Ash logs do not remain long on the forest floor, for once in contact with the soil, decomposition proceeds rapidly relative to many other hardwood species. Areas with high proportions of ash show low volumes of woody debris.

The ash is a food source for a wide variety of birds, including song birds and so-called "game birds." Beavers occasionally use ash in building their dams.

USES

As would be expected, indigenous Americans knew the White Ash well. The wood was used for bows, arrows, and canoe paddles. In *American Indian Medicine*, Virgil Vogel reports that the Delawares used a "decoction" of buds or bark of the White Ash internally to fight the effects of rattlesnake bite. Another use of White Ash, cited by Vogel from a report by Samuel Stearns, was in curing cancer. The Penobscots of Maine used the leaves of the White Ash in a bitter concoction to cleanse after childbirth. White Ash concoctions were also useful in cases of fever. The Abenaki people of northern New England believe they were created from the ash tree. Today ash bark is a prime resource in making baskets.

In *Tree Medicine Tree Magic*, Ellen Evert Hopman gives the following description for the medicinal uses of White Ash to herbalists: "In spring and early summer, the young tender tops and leaves are used to make a fasting tea that is both diuretic and a laxative (Herbal tradition recommends it as a weight loss aid.) The infusion also benefits jaundice, gout, and rheumatic conditions, making it a classic spring tonic to burn off winter fat and to help clear out a body's system.... The white ash is used homeopathically for uterine conditions, especially fibroids, uterine enlargement, and uterine tumors, and it is also useful to treat infantile eczema."

PSYCHOLOGICAL IMPACT OF THE ASH FAMILY

Although this article is principally about the White Ash, it is worthwhile noting that its close relative, the Blue Ash, *Fraxinus quadrangulata*, is as adored as its slightly larger brother. The sweeping, graceful forms of both species impress themselves into the tree-psyche of mortals who need the presence of trees. In *Our Native Trees*, Harriet Keeler unabashedly states that the ash is the most beautiful of American species. Julia Ellen Rogers, in *The Tree Book*, says "The white ash is one of the noblest trees in the American forest, the peer of the loftiest oak or walnut." In *Our Friends The Trees*, P.G. Cross reveals his special feeling for the ash: "No nobler tree raises its leafy head in the



staminate, or pollen-producing flowers
illustration by Heather Lenz

North American area than the white ash. Of this order of trees it is the king, in its native soil often topping the loftiest oaks and walnuts." We see the impact of not only *Fraxinus americana* on Dr. Cross, but also of the thoughts of Julia Ellen Rogers.

I asked Michael Perlman if he could summarize the influence of the White Ash on his thinking. In the words of the *Power of Trees* author, himself:

The White Ash is of a distinctly artistic nature. He or she possesses slenderly oblate yet luxuriant leaves that, while singular in shape, easily evoke the Black and the White Walnuts, and graceful arching branches whose semi-vase like shape remembers the American Elm period. To say this is not to say that the White Ash's is a borrowed magnificence, but rather to point to the generousness, even the delicacy, of the tree's demeanor: it is a quintessential forest tree whose form celebrates—I want to say "paints"—in subtle shapes and shades reminiscences of several of its arboreal neighbors. The bark of the White Ash has a welcoming character in a depth of impressiveness that, conversely, is recalled by the bark of those denizens already mentioned—American Elm, Black and White Walnuts, especially very young adults of those species—and also the Yellow Poplar. But the bark's regularly interlocking ridges, ranging from brown to a slightly purpled gray, and relatively non-abrasive texture even when quite old, make the White Ash a peculiarly approachable tree. It is no coincidence that White Ash of all shapes and sizes loom large amongst those trees that beckoned me back toward trees in general at a certain point in my life as a writer. When I think of how amazing is the very existences of trees—the White Ash stands as signal and definition of that forested wonder.

THE ASH'S ROLE IN OLD-GROWTH FORESTS

The ash is a sparsely distributed tree in old-growth forests. One need only to visit the Adirondack Forest Preserve and cruise the boundaries of the virgin hardwood zones to witness an abrupt drop in the abundance of ash inside the old-growth areas relative to its abundance in the regrowth zone. Its percentage of occurrence likely varies between 1% and 4% in the old-growth zone. In areas of regrowth, ash can comprise 10% to 15% over fairly large areas. This fits with John Kricher's description in *Eastern Forests* of the White Ash as a species that "Invades old fields on mesic sites, persists in mature forests." In *Buffalo's Backyard Wilderness*, forest ecologist Bruce Kershner documents the percentage of White Ash reproducing in an old-growth remnant known as the Reinstein Woods. Ash was documented "along 26.1% of the general survey transects, but was noted primarily as seedlings in forest gaps and near enough to forest margins where more light entered from adjacent sunny wetland areas." On occasion, small old-growth

patches can contain a higher proportion of large ash stems, probably exploiting significant areas of disturbance. The fast growth of the species is part of the answer for its temporary dominance, but the ash needs disturbances to give its seedlings a chance to make spectacular bursts of growth. Once those disturbances occur and ash seedlings reach upward, they may become the loftiest trees in the northern forests. One of the best descriptions of White Ash in old-growth forests comes from the Hough and Forbes 1943 US Forest Service report, *The ecology and silvics of forests in the high plateaus of Pennsylvania*: "White ash, like black cherry, occurs in small groups or as scattered single trees in the virgin forest. Occasionally plateau tops and upper slopes devastated by tornados regenerated to white ash, black cherry, yellow poplar, cucumber magnolia, in mixture with seedlings and saplings of beech In the undisturbed virgin forest, however, white ash reproduction and saplings are fairly abundant, and have survived up to 6 inches d.b.h under 50 to 70 years suppression. Ash saplings of 30 to 40 years of age were more abundant than those of other age classes in the virgin forest. Many required 20 to 30 years to reach 0.6 inches d.b.h. Ash saplings in such sites persist fully as successfully as the birches and more successfully than black cherry."

For big tree afficianados, if specimens grow today that rival the ash's former splendor, then the Great Smoky Mountain National Park is the logical place to look. Will Blozan is hunting them now. So far, Will's finds prove that scatterings of great ash trees in the 13 to 17 foot circumference range are still to be found. Heights of these trees are in the 130–135 foot class.

FUTURE OF THE WHITE ASH IN EASTERN FORESTS

The White Ash is declining in some areas of the Northeast. Stressed trees seem most affected. The causes of decline are yet to be determined. The long-term prognosis for the species is mixed. Other great hardwoods like the American Chestnut have lost the battle to human interference. Let's hope the ash will not follow suit. It is a tree that deserves our fondest feelings. ■

Though he has been joined by many, Robert Leverett remains the preeminent advocate of Eastern old-growth forests. He and Anthony Cook have begun work on the 4th Eastern Ancient Forest Conference, scheduled for 15-18 May 1997 at Clarion University in Clarion, PA (details in a future Wild Earth). Bob Leverett, Will Blozan, Jack Sobon, and Anthony Cook have begun collaboration on a guide book to big trees and how to measure them. The biggest and best of each species will be featured. The book will be completed in about a year.

Friends of the Boundary Waters Wilderness

by Kevin Proescholdt

The Friends of the Boundary Waters Wilderness, celebrating its 20th anniversary in 1996, formed during a bitter dispute over the future of Minnesota's million-acre Boundary Waters Canoe Area (BWCA). In a big dose of *deja vu* all over again, this wilderness advocacy organization of 4000 members nationwide is scrambling once more to fight off a major bi-partisan congressional attack on the BWCA Wilderness that would roll back 70 years of wilderness protection.

The area's wilderness protections date back at least to 1926, when Secretary of Agriculture William Jardine designated a thousand square miles of Superior National Forest as the nation's second wilderness. The Boundary Waters Canoe Area was included as an original unit of the National Wilderness Preservation System with passage of the 1964 Wilderness Act. Unfortunately, the Act also singled out the BWCA to allow continued logging and motorboat use. This led to a series of controversies through the late 1960s and early 70s. In Congress, Representative Jim Oberstar (D-MN), in whose district the BWCA is located, proposed dismantling the BWCA and removing 400,000 acres from Wilderness status. The Friends promoted Wilderness legislation, much of which passed in 1978 as the BWCA Wilderness Act.

The Republican take-over of Congress in the 1994 election, however, fueled long-simmering grudges and distaste in northern Minnesota for both the BWCA Wilderness and Voyageurs National Park immediately to the west. Senator Rod Grams (R-MN) scheduled congressional field hearings for northern Minnesota's International Falls in August of 1995 to hear the demands, which included (again) dismantling the BWCA as wilderness by opening the canoe country to motorboats, trucks on portages, and snowmobiles, as well as stripping Voyageurs of National Park status and turning it over to the state or counties to manage. Representative Oberstar, still opposed to wilderness; saw his opportunity to work with the Republican majorities in Congress to degrade the canoe country. Representative Bruce Vento (D-MN) has forcefully and eloquently opposed degradation of either the BWCA Wilderness or Voyageurs National Park.

Both Oberstar and Grams have announced their intentions to introduce legislation this year that would turn the BWCA over to a local-control management council. Senator Paul Wellstone (D-MN) is running for reelection in 1996, and Republicans hope to attack Wellstone on the Voyageurs and BWCA issues in order to splinter his support in either the heavily-Democratic Iron Range of northern Minnesota or with wilderness supporters elsewhere in the state.

For up-to-date information about this issue, how to help protect the BWCA Wilderness and the entire international Quetico-Superior Ecosystem in which it lies, or how to become a Friends member, contact Friends of the Boundary Waters Wilderness, 1313 Fifth St. SE, Suite 329, Minneapolis, MN 55414; (612) 379-3835.



Great Old Broads for Wilderness

by Michael J. Hoffer

Time and Trouble will tame an advanced young woman, but an advanced old woman is uncontrollable by any earthly force.

—Dorothy L. Sayers

A common theme heard on Capitol Hill these days, especially from the Republican majority, is the need for America to get back to its traditional values. Respecting and listening to your elders is one of those values, and Great Old Broads for Wilderness (GOB) has a message for Newt and his crew—save Wilderness.

Great Old Broads for Wilderness members, many in their 60s, 70s and 80s, tramp up mountains, hike desert canyons and spend days in the backcountry exploring the natural world. Those unable to hike are content to just sit and gaze into the wild. The act of doing something within wilderness is not so important as the fact that it is there. This belief that wilderness has intrinsic value lies at the core of the organization's philosophy.

The goal of this nationwide organization is to strengthen and add to the National Wilderness Preservation System. GOB wants to show Congress, politicians and wilderness opponents that wilderness is valuable to everybody, whether young or old.

Susan Tixier, president and co-founder of Great Old Broads for Wilderness, believes this group of old women can provide a new symbolism for environmentalists. In other cultures, particularly those close to nature, older women are keepers of wisdom; they help guide the young by sharing their knowledge for the betterment of the community.

Besides a sense of patience and wisdom gained through decades of life, Great Old Broads bring an understanding of how permanent the loss of wilderness is in their lives and the lives of their grandchildren and great-grandchildren. They know: what breath is to life, so is wilderness to life.

Another important part of their philosophy involves spicing life, work and protest with humor. Humor is a powerful tool. People and organizations who take themselves too seriously end up fighting amongst themselves rather than for the land. Laughter energizes and empowers people to work harder. This ability to laugh with life defines a Great Old Broad.

A Great Old Broad is a woman over the age of 45; however, because broadness is a state of mind, anybody can be a member of GOB regardless of age or sex. Still, most of the 1000 members do meet the "technical" requirements.

When Great Old Broads for Wilderness started, they were content to work as individuals on wilderness issues. Educating people on the values of wilderness through talking, sharing, writing letters to editors, and working with local environmental organizations was the extent of the group's actions. That changed three years ago as the fight for Utah wilderness heated up.



Individual action gave way to the combined forces of all the members. In 1994, Great Old Broads for Wilderness "hugged" Grandmother Mountain in northern Idaho and held their first "Broadwalk across Utah." In 1995, with the introduction of the dismal wilderness bill by Utah's congressional delegation, H.R. 1745, they staged another Broadwalk, this time for four weeks rather than four days.

Each week during the last Broadwalk, they explored a different area of the proposed 5.7 million acre American Redrock Wilderness Act. At the end of the week, they met with the BLM officials responsible for the land's management and demanded that it be protected as Wilderness. During the "Broadwalk" and at their fifth annual wilderness conference, Great Old Broad members were interviewed and photographed by television, radio and print media, helping to bring national and regional coverage to the wilderness debate in Utah.

A video of the 1995 Broadwalk is being put together for members and other environmental groups to use to combat claims that wilderness is only for the young and healthy. Also, Great Old Broads is working on a book called *Circle of Crones*. Canyon Crones are women whose work and passion for wilderness are an inspiration to the rest of the members, and the book will profile their lives and relationships with nature.

Great Old Broads for Wilderness wants to continue to place their ideas and philosophy of wilderness preservation in the forefront of the country's various wilderness debates, whether in Utah, Montana, Alaska, or any other state. Plans for 1996 include another Broadwalk in Utah, a wilderness conference, and climbing Capitol Hill.

As the Great Old Broads grow in size and strength, they will become even more active as a group and as individuals. It is one thing for wilderness opponents and government officials to confront young, "long-haired, environmental radicals." What will they do when the people chained to the gates of logging roads, perched in trees, and standing in front of bulldozers are old, gray-haired grandmothers?

You, too, can be recognized as a Great Old Broad for Wilderness. Membership dues are \$25 a year. When you join, you will receive a Great Old Broads for Wilderness T-shirt and the quarterly newsletter, "Broadsides."

Write Great Old Broads for Wilderness, POB 4921, Missoula, MT 59806; 406/543-4205. ■

Michael Hoffer is a freelance writer in Missoula, Montana. Besides editing the "Broadsides" newsletter, he writes for Edging West magazine.

Fragments

*Our porch has its nests and webs
and now folded each summer between shutter and house
a drop of shadow with delicate elbows,
its body in the shape of an M—*

*Mom ran with a scream from their bedroom
where darkness had edged
in through a screen and clung
to the grid, silhouetted
above their bed. Bat! Bat!
Two little girls huddled chilly in flannel
against their mother while Dad
in a shower cap took dictionary
and racket into the room.
Thrashing and thumps and finally the thud
as book hit body no blood
but a silence that succeeds
the violence of fear.*

*Evenings our bat creeps from the shutter
to join others who wheel
from the attic. Our roofer has urged
us to install some screening
but we prefer watching the sky
fill with chaos above our heads.
Our chairs hold us like magnets
as our attic empties its fragments
of darkness into the dusk.
And we trust our bats
will return with the light
to pad our eaves,
catching the drafts with their
warm bodies.*

—Sheila McGrory-Klyza

Big Wild Advocates

by Howie Wolke and Marilyn Olsen

Big Wild Advocates is a service organization designed to enhance the efforts of the wildland conservation movement. We provide consulting, organizing, educational, and lobbying (to the extent allowed by law) support for leading organizations and individuals. Writing, public speaking, and the production and distribution of vital educational information—such as our Greater Salmon-Selway Ecosystem and Salvage Mania/Forest Health Sham publications—are parts of our work.

Primarily, we identify empty niches in the conservation movement and work to fill them. It's been said that "nature abhors a vacuum," and so do we. Though we are based in the Northern Rockies and often are consumed by regional issues, our area of concern is global and our work includes efforts to enhance wildlands conservation throughout the United States.

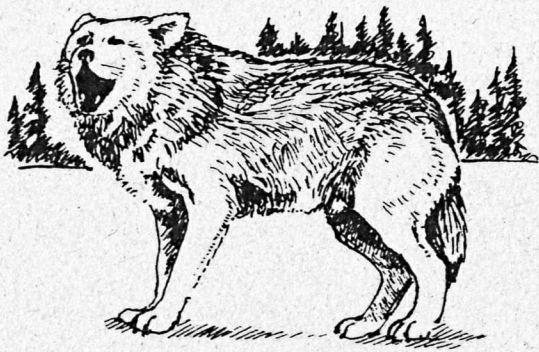
Big Wild promotes the protection of all remaining unroaded and generally undeveloped wildlands in the US. We work to restore ecologically viable wildland ecosystems with self-sustaining populations of all surviving native species in all regions of North America. In short, saving and restoring native biodiversity is our goal. In addition, we support efforts to *reduce* the human population on a global scale, because without human population reduction, efforts at wildland conservation will ultimately fail.

We promote thoughtful debate based upon conservation biology and upon our intrinsic gut-level biophilic drive to connect with wild living things and places. We oppose the further compromise of native life, land, and water.

Big Wild Advocates is an outgrowth of the Greater Salmon-Selway Project (GSSP), which was formed to promote and defend the unsurpassed wildland values of the Greater Salmon-Selway Ecosystem of central Idaho and extreme western Montana. After three years, many GSSP goals had been met; GSSP was terminated as an organization, and the GSSP board of directors then formed Big Wild Advocates. Big Wild will maintain GSSP as an ongoing project. Other Big Wild projects include Grizzly Bear restoration in the Salmon-Selway, exposing the salvage/forest health sham, Northern Rockies ecosystem protection, and conservation education for young people.

Big Wild Advocates, Inc. is a 501-c-3 non-profit. Contributions are tax-deductible as stipulated by law. We are a *non-member* organization; thus we do not and will not compete with established grassroots groups for members.

The Big Wild Board of Directors consists of Howie Wolke, Marilyn Olsen, and Larry Campbell. Most BWA projects are carried out by Howie Wolke and Marilyn Olsen. For information contact, Big Wild Advocates, POB 318, Conner, MT 59827. ■



Big Businesses Give Back to their Grass Roots

by Amy Flanders

Without wild areas, the country's most successful outdoors companies would soon go bankrupt. In 1989, companies aware of this formed the Conservation Alliance to help protect both their business interests and the country's remaining fragments of wilderness. Member companies donate time, talent, and media attention as well as a portion of their annual earnings. Each year the Alliance awards grants to those grassroots organizations who exhibit "a passion for their issue and a plan of action to get results."

To be a member, a business must be based upon a self-propelled or muscle-powered outdoor activity that depends upon conservation of the environment. Current members include manufacturers, publishers, retailers, contractors, mills, resort operators, and dealers. Funds are collected on a progressive scale, with an annual fee structure organized so that outdoor businesses of all sizes may participate. Specifically, businesses with annual revenues of up to \$1 million donate \$1000; those with annual revenues from \$1 million to \$10 million donate \$5000; and those with annual revenues over \$10 million donate \$10,000 or more. The funds are pooled and distributed to environmental groups for specific projects selected by the members. The Alliance is run by a volunteer board so that all membership fees directly aid grassroots organizations.

Membership has numerous benefits. Most important, companies' support of groups fighting to save the environment helps protect the outdoors which is the source of their business. Moreover, all members have an equal say in deciding which group receives funding; thus if approved for sponsorship, more money may go to a favored environmental issue than a single company could donate on its own. Finally, membership is evidence of a company's commitment to the environment, an attractive attitude in the "green" consumer market of today.

Many of us enjoy looking at the picturesque photographs in the Patagonia catalog, and reading about grassroots organizations fighting to save the wilderness which we eagerly explore in our designer gear. Feeling good, we whip out our credit cards and charge away. Hey, our money is going to a good cause—we are actually doing something to save the Earth, right?

In fact, the Conservation Alliance *has* been "doing something." A \$40,000 Alliance grant meant victory for the "Tat Wild" group fighting a large copper mining company threatening the Tatshenshini-Alsek River system of Alaska and Canada. This area became part of a 24 million acre international wilderness preserve. The Friends of Grandfather Mountain used a \$40,000 grant to help purchase a crucial tract of land on the Mountain. This acquisition saved unique habitat with endangered plants and animals, trout streams, and hiking trails in one of North Carolina's top tourist areas. Conservation Alliance funds have helped the Tuolumne River Preservation Trust stop the construction of a dam on the Clavey River. A \$30,000 grant will be used by the coalition of 12 conservation and recreation organizations to secure federal Wild and Scenic designation of the free-flowing Clavey River. With Conservation Alliance funds, the Sierra Club of Western Canada utilized the Commonwealth Games to gain publicity for the protection of Clayoquot Sound from logging. A Conservation Alliance grant is helping the Greater Yellowstone Coalition (GYC)

fight Noranda Minerals Inc.'s attempt to build a gold mine in an area with critical wetlands and Grizzly Bear habitat. With Conservation Alliance funding, the Southern Utah Wilderness Alliance (SUWA) has been able to pressure the Bureau of Land Management to update resource management guidelines and to protect the Virgin River from damming.

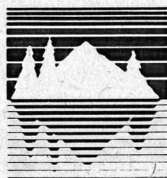
The Conservation Alliance voted to fund three new grants in April 1994. Trout Unlimited, with over 70,000 members nationwide, plans to initiate citizen activism to protect free-flowing rivers, improve stream flows, restore trails, and enhance riparian habitat for wildlife. The Pinelands Preservation Alliance (PPA) will use their \$49,000 grant to support statewide lobbying and public education efforts on behalf of New Jersey's 1.1 million acre Pineland. A grant of \$29,592 was awarded to the Sierra Biodiversity Institute (SBI). A non-profit project of the Tides Foundation, the SBI will use the grant to conduct a national public outreach campaign and to publish a book on the biological, historical, social, and economic benefits of preserving the Sierra Nevada ancient forest wilderness.

Most grassroots organizations lack extensive fund-raising capabilities, and for this reason, a grant from the Alliance can mean the difference between success and failure. Unfortunately, many of the member businesses are still unaware of the numerous grassroots organizations and their work. Libby Ellis, formerly with Patagonia, now with The Nature Conservancy, believes the Conservation Alliance's outreach could be widened with greater participation from member companies. If member companies brought more proposals before the board and became more involved with environmental issues in their own communities, a greater number of environmental organizations could receive grants. Libby urges grassroots groups to be "more proactive in calling the Alliance members and asking members to support and 'sponsor' their proposals." Outdoor businesses need to be made aware of what is currently happening on the environmental front; environmental activists should encourage those buying equipment to buy from Alliance member companies.

So, next time you hit the catalogs or the camping stores, keep in mind the following list of Conservation Alliance members and their products and services.

For more information contact The Conservation Alliance at 6750 S. 228th Street, Kent, WA, 98032, (206) 395-5957. ■

Amy Flanders prepared this article while serving as Wild Earth intern. She is now back at Middlebury College, in the Environmental Studies Program.



The Conservation Alliance

Outdoor business giving back to the outdoors.

- x Elected Board Members
- Permanent Board Members

- x Grabber International - handwarmer manufacturer
- x Kirwin Communications - public relations, communications firm
- Kelty Pack - packs, sleeping bags,
- The North Face - tents, packs, outdoor clothing
- Patagonia - specialty outdoor clothing, rain gear
- Recreational Equipment Inc. - outdoor gear retailer and mail order co-op
- x Backpacker's Pantry - backpacking food
- x Outdoor Retailer - trade magazine
- x Thor-Lo Sock Company - socks

- Adventure 16 - outdoor gear, retail and mail order in southern California
- AlpineAir Quality Foods
- Backpacker Magazine
- Browning - specialty outdoor gear and clothing
- Burlington Industries - fabric
- Campmor - outdoor gear, retail and mail order
- Colombia Sportswear - outdoor clothing
- Consoltex - fabric
- Eagle Creek Travel Gear - packs and travel gear accessories
- Gregory Mountain Products - packs
- Harborside Graphics Sportswear - specialty t-shirts
- Hoechst Celanese Corp. - fabrics
- Johnson Camping/JWA No. America - backpacks, Eureka tents
- Kenyon Consumer Products - thermal underwear, technical accessories
- Lowe Alpine Systems - packs
- LowePro Camera Bags - camera packs
- Malden Mills Industries - fabric
- Mountain Safety Research - backpacking stoves
- Nike - footwear
- Orange Vetements Sportswear - outdoor clothing
- Outside Magazine
- Perception - whitewater kayaks
- Reebok International Ltd. - footwear
- Rennie Publications - outdoor industry trade publications
- Self-Propelled Outdoorsmen - outdoor retailer
- Sorensen's Resort - Sierra Nevada resort
- Spiker Communications - public relations firm
- Sporting Goods Manufacturers Association - outdoor industry trade group
- Squinch, the Activity Drink - liquid replacement activity drink
- Teva Sport Sandals - Teva sandals and Deckers footwear
- The Timberland Company - clothing and footwear
- Vasque Division - hiking boots
- W.L. Gore & Associates - Gore Tex fabric
- Walrus - tents
- Yakima Products - multi-use car racks
- YKK (USA) - zippers and accessories

ASPI: A Profile

by Al Fritsch

Appalachia—Science in the Public Interest (ASPI) seeks to make science and technology responsive to the needs of lower income people of Central Appalachia so that they may live in ways compatible with the full range of wildlife in one of North America's most diverse ecoregions. Our goal is to introduce and cultivate ecological principles and appropriate technology among people who cannot afford the additional time or money presently needed to participate in sustainable lifestyles. For example, we promote using renewable energy sources, consuming organically grown food, and working to preserve native ecosystems. This goal has been achieved over the past two decades by a variety of activities such as production of educational materials, assessments of other non-profit groups, and the introduction of a sustainable forest program. ASPI has developed several low-cost appropriate technologies, including three types of cisterns and five models of dry composting toilets.

The Appropriate Technology Demonstration Center, originally started as a "Science for Citizens" project by the National Science Foundation, is now the oldest of four ASPI programs. The Center is located on the banks of southeastern Kentucky's Rockcastle River, which is a candidate for federal designation as a Wild and Scenic River, only two miles from Exit 49 on Interstate-75. It is surrounded by the Daniel Boone National Forest and the grounds consist of 32 wooded acres owned by ASPI and an adjacent 150-acre land trust, also mostly forested. The physical facilities include a solar demonstration house, low-cost housing examples (a yurt, dome, and cordwood building), an appropriate technology and environmental library, camping facilities, three solar greenhouses, and three intensive organic gardens.

ASPI Publications strive to put technical and educational literature in the hands of average citizens. One major source of ASPI funding has been twenty years of the "Simple Lifestyle Calendar" with hints for every day of the year. Other publications include books, reports, brochures, and a series of 38 appropriate tech-

nology papers on such subjects as mulching and Appalachian edible wild plants. In the last two years a television program, "Earth Healing," has been produced on a monthly basis, along with a series of oral and video histories on Appalachian practices worth preserving.

The Resource Assessment Service is a systems approach to resource use that helps organizations and communities become self-sustaining through analysis of physical facilities, land use, water, wildlife, energy, waste management, food, indoor environment, transportation, and community relations. Suggested ten-year environmental development plans are offered along with a discussion of existing resources. The assessments have been conducted for 108 non-profit groups in 25 states.

ASPI's newest program is the Appalachian Sustainable Forest Center, also located on the demonstration grounds. It includes eco-forestry demonstration plots and over four miles of nature trails. Other forest projects include a slide show on the Mixed Mesophytic Forest (ASPI's Center is located near the geographic center of this highly varied hardwood forest), which has been shown to thousands of school kids in the region; the sponsoring of Kentucky Forest Watch (a coalition of environmental groups developing an alternative plan for the Daniel Boone National Forest [see Chris Schimmoeller's article in this issue's Updates]); participation in a region-wide forest health monitoring project that has established, and is training citizen monitors for, fifty sites in Eastern Kentucky; and research on several broader forest issues—the concept of a "Forest Commons," the environmental impact of off-road vehicles [see Paul Kalisz's Biodiversity Report in this issue], and remnants of the East's original forests, which we will catalog in an Eastern Old Growth Clearinghouse. ■

Al Fritsch, SJ, is Director of ASPI (Route 5 Box 423, Livingston, KY 40445) and author of numerous books including Environmental Ethics, Renew the Face of the Earth, and Down to Earth Spirituality.

The Role of Private Lands in an Ecological Reserve System

by Jamie Sayen

*There is reason for optimism
that many small forest land
owners (less than one
thousand acres) will leap at
the opportunity to
incorporate their lands into
a state, regional, national,
and, ultimately, a
continental Wildlands
reserve system.*

TO FULLY IMPLEMENT the vision of The Wildlands Project, we must develop a strategy for establishing reserves on lands not currently in public ownership. This is especially critical for lands east of the 100th meridian, where the general pattern is scant public ownership, highly fragmented land ownership patterns, and considerable urban and suburban development and sprawl.

Here in the Northern Appalachians, there are two basic patterns of non-public ownership of land: (1) large tracts of absentee-owned forest lands that are essentially uninhabited by humans on a year-round basis (although they are criss-crossed with logging roads and are heavily logged); and (2) small, privately-owned tracts, which are generally more developed (ranging from remote rural communities to cities and suburbs). The Northern Appalachian Restoration Project has already offered a proposal for a HEADWATERS Wilderness Reserve System in the unpeopled, absentee-owned lands (see "A Second Chance for the Northern Forests," *Wild Earth*, Winter 1995-1996 pages 37-39). In this article I address the more fragmented, developed and populated lands of the Northern Forest region.

In our HEADWATERS proposal, we indicated that "Phase 2" would evaluate the developed regions of Maine, New Hampshire, and Vermont using the conservation biology strategies outlined by Noss and Trombulak. Serious ecological and political problems in these more developed areas will make the work of Phase 2 difficult. Large timber holdings in the HEADWATERS region have been severely degraded by two centuries of unsustainable logging, fire suppression, plantations, pesticides, road-building, dams, and persecution of native carnivores, yet they remain relatively well-covered with forest, waiting to be allowed to recover ecological vigor. In contrast, many of the small private tracts have been converted to urban, suburban or agricultural purposes. Moreover, politically, it is easier to deal with a very small number of landowners (many of whom are in the process of unloading large tracts of land), where there are no year-round inhabitants, for prices that average about \$200-300 per acre over a 10-million acre region, than to deal with the many small landowners in a more inhabited region.

Conservationists cannot, however, sacrifice the latter areas. Most of the region's endangered species and natural communities are located in areas attractive to both people and wildlife. Due to development, fragmentation of ownership, and the presence of several million human residents, it will be much more difficult to acquire large contiguous tracts of land in these generally more southerly areas; it will cost much more per acre; and the task of ecological restoration is much more daunting.

Thus, it will be essential to use all scientific tools—GIS, Gap Analysis, Natural Heritage Inventory, and restoration ecology research—as well as local knowledge and a great deal of education and outreach to affected residents of the area. Widespread public support will be a prerequisite for designing politically palatable reserves that effectively protect native biological diversity and ecosystems.

Fortunately, here in New Hampshire—and I believe in almost every forested state in the United States—there is reason for optimism that many small forest land owners (less than one thousand acres) will leap at the opportunity to incorporate their lands into a state, regional, national, and, ultimately, a continental Wildlands reserve system.

The 1995 New Hampshire Forest Inventory Project discovered that “landowners representing an estimated 1,344,589 acres of forest land do not expect to allow their lands to be available for harvest during their ownership tenure.” This represents about 28% of the non-public forestland in the state. The bulk of this land lies outside (south of) the HEADWATERS region.

This means that owners of approximately 30-40% of the most developed parts of the state are already managing their lands for some of the values of The Wildlands Project, albeit without any coordination on a statewide basis or collaboration with their neighbors.

Leaders of the NH forest products industry have expressed concern and regret that these lands are unavailable for timber harvesting. Some even urged the steering committee that wrote the state “Forest Resources Plan” (FRP, released in spring 1996) to develop methods for persuading these landowners of the ecological benefits of timber management.

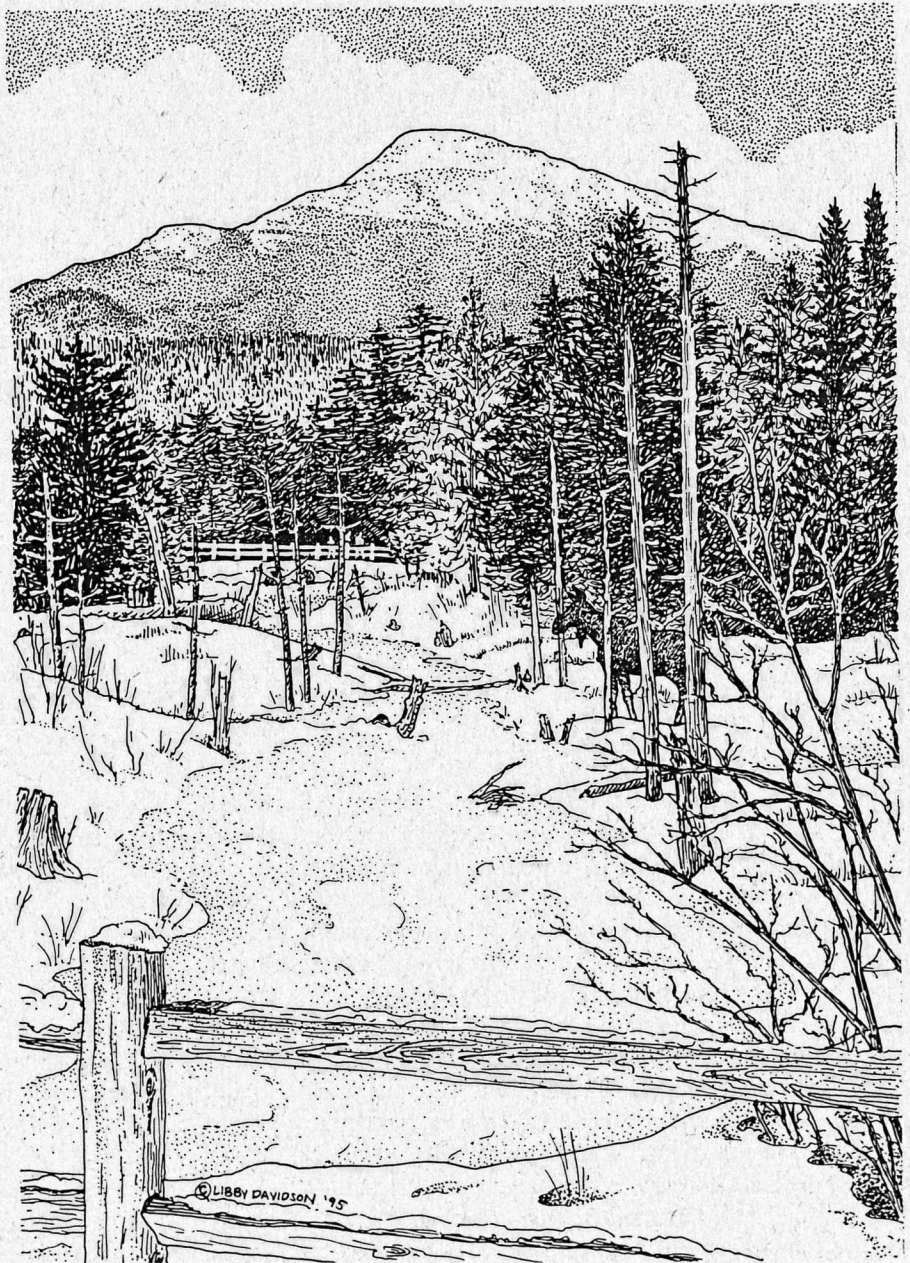
At the same time, many of these same industry and landowner leaders helped to establish a state Ecological Reserve Steering Committee (ERSC) in Autumn 1995. The FRP explicitly calls for the establishment of a state ecological reserve system, and it encourages towns to consider including town-owned land in a statewide system of ecological reserves.

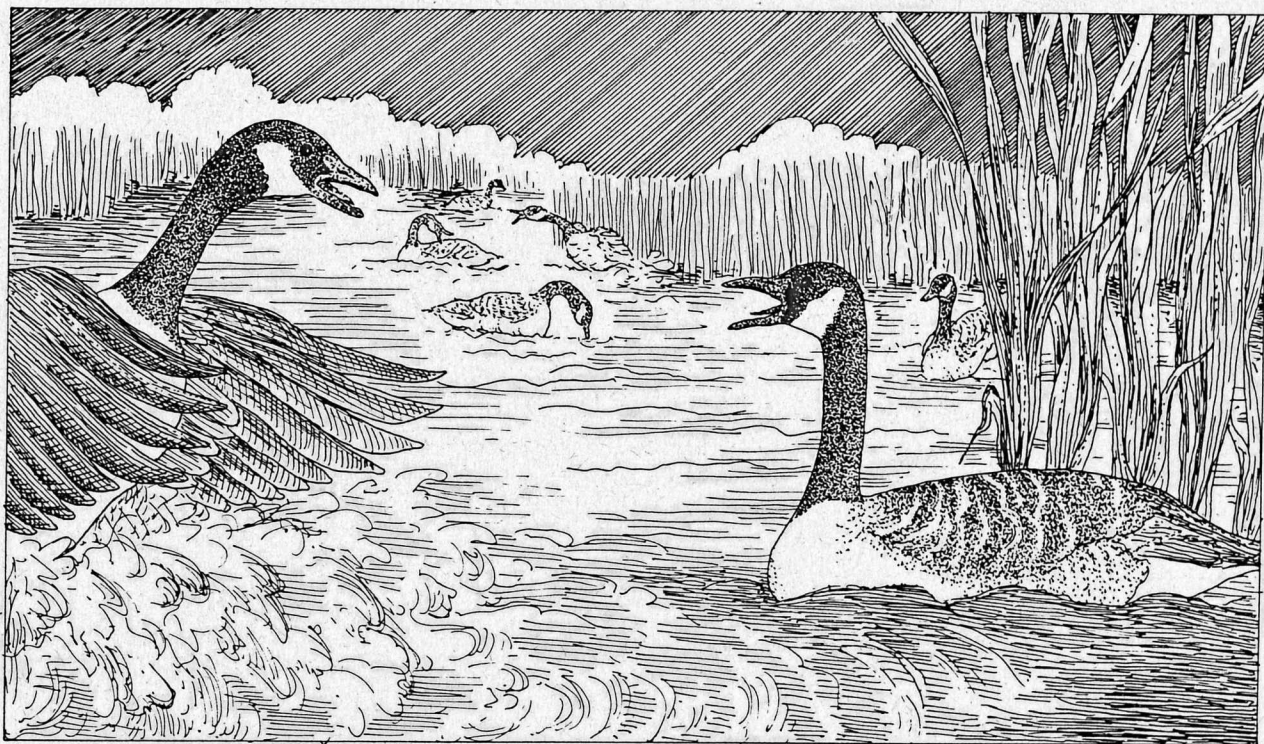
As an ERSC member, I have come to believe that instead of a state-sponsored lobby effort to persuade landowners to reconsider their attitudes toward timber harvesting, New Hampshire should make a virtue of this situation and offer these landowners a second option: enroll their lands in a state ecological reserve system.

The NH ERSC should develop support programs that encourage the owners of these 1.3 million acres to formally and voluntarily participate in a state ecological reserve system. This approach would have many virtues in addition to helping to protect the state’s ecological integrity:

- 1) It would respect landowner desires not to cut trees;
- 2) It could give technical assistance and incentives, including current use tax breaks, to landowners who want to participate in a program that helps support the ecological integrity of the state;
- 3) It could protect more than one-quarter of the state in an Ecological Reserve System;
- 4) The land would not have to be acquired, and therefore would be much less costly to incorporate into the reserve system.

I have been extremely heartened by the preliminary response to this proposal, from industry leaders, large landowners, and state forest policy makers, and I am confident that the idea will receive a genuinely good-faith examination by the ERSC in the next couple years.





There are, however, some very important limits to bear in mind. We do not know how many of the most ecologically sensitive and critical lands are owned by individuals who do not wish to harvest their lands. Ecologically significant lands owned by people who do not wish to cut their lands would be priority tracts for inclusion in the state Ecological Reserve System.

Another problem is that average landownership for the state lasts only seven years, and future owners may not hold the same attitudes. Further, a very high percentage of landowners is over 65 years of age. A new owner might wish to practice forestry, or a new owner might wish to develop the land—thus removing it from both the timber system and the Ecological Reserve System. The solution to this is to offer the current landowner an opportunity to place an “ecological reserve” easement on her/his land in exchange for estate, income, and property tax relief. Many landowners may opt to donate such an easement—thus generously contributing to the ecological and economic legacy of the state. Donated “Forever Wild” easements should be the highest priority.

We will not be able to secure all lands needed for an Ecological Reserve System on existing public lands and from lands owned by people not interested in tree-harvesting; nor will we solve all problems relating to habitat and ownership fragmentation. We can, however, take a giant step in the establishment of an Ecological Reserve System by ascertaining landowner attitudes in more developed areas and then designing easement, zoning, taxation, and other incentives to landowners to manage their lands both according to their wishes *and* in harmony with the goals of a state/regional/national/continental Ecological Reserve System.

How might this work? We know several things about the NH landowners who don't wish to cut their forest lands:

- 1) Their motivation for not cutting is probably aesthetic and/or stems from concerns for wildlife;
- 2) They can afford not to cut;
- 3) A great many are at or beyond retirement age;
- 4) Much of this “unavailable” land is located in central and southern New Hampshire where development and fragmentation are greatest, where there are the most endangered species and communities, and where there is the least public land.

Ecological Reserve Easements

Participation in the NH system of Ecological Reserves by private landowners would be voluntary. However, it is essential that once a landowner decides to participate, her/his lands remain in the reserve system; new owners must not have the ability to withdraw such lands from the reserve system. This will require “ecological reserve easements” that permanently incorporate such lands into the state reserve system. EREs will, like traditional “conservation easements,” prohibit development; they may also prohibit other extractive activities such as logging and mining. However, each ERE will be designed to meet the needs of the specific situation. Lands containing rare, fragile or especially significant ecological features should be managed as Wilderness. Lands that are less ecologically critical, but provide important buffering for more sensitive lands, could be managed as part of a buffer zone where some low-impact forestry may be permissible.

Since the decision to participate will be voluntary, it will be up to the landowner and managers of the ERS to develop appropriate easement language.

illustration by Libby Davidson

Donation or Acquisition?

New Hampshire and most other Eastern states currently have very limited land acquisition funds. The situation may improve in coming years as citizens become more aware of the need to protect biological integrity in every region, but we cannot count on this. In any case, we should develop incentives and tax policies that encourage landowners to donate Ecological Reserve Easements on their lands to the state Ecological Reserve System.

While we cannot expect that all landowners will be willing or able to donate an easement, we should provide them with an attractive opportunity to do so. Despite the seeming ascendancy of the politics of mean-spiritedness, many citizens would leap at the opportunity to commit an act of generosity toward their fellow citizens, future generations, and all the other critters native to the area.

Reduction of property taxes, an income tax deduction for the value of the donated easement, or estate tax deductions for heirs who make such post-mortem donations are some of the possible incentives. Priority for acquisition of Ecological Reserve Easements should be for critical tracts whose owners cannot or will not donate to the system.

Objections

Property Rights: Anti-environmental property rights extremists will call this a "land grab" and a violation of property rights. Such charges are silly. Participation would be voluntary. If a landowner does not wish to sell or donate an easement or full title, she/he will not be coerced. Eminent domain is almost never used to acquire land for ecosystem protection; rather, it is a favorite tool of the builders of our interstate highway system, for dams, and for other environmentally-destructive development projects. Curiously, the so-called "property rights" defenders never seem to object to economically-motivated "takings."

Property Taxes: Municipal officials will object to a loss of property tax revenue. This is a myth that refuses to give up the ghost. Countless studies show that open space lands are a net plus for towns because they require next to no services. If we add the economic benefits of healthy lands which provide clean air and water and attract tourists and recreationists, reserve lands become even more attractive financially. Still, the real argument is qualitative—protecting our life support system enriches our quality of life regardless of what the bean-counters say.

State Forest Policy Issues

- 1) State forest resource plans should recommend the establishment of a system of ecological reserves dedicated to the protection of ecological integrity.
- 2) There should be explicit reference to the role that private lands can and must play in such a system.
- 3) Landowner education is vital. Currently states provide information to landowners about timber and wildlife management, some of which is based on out-moded, non-sustainable

premises. States should also provide information to landowners about the Ecological Reserve System and how private landowners can participate. Thus, rather than pressure reluctant landowners to log their lands, the state should be an honest broker offering responsible stewards a range of options.

- 4) Current zoning regulations should be reviewed for their impacts on land protection. Barriers to reserve creation should be removed.
- 5) States should work with municipalities regarding the inclusion of town forest lands in an Ecological Reserve System.
- 6) States should provide support for landowners to assist them in conducting biological surveys on their lands.
- 7) States should develop information for landowners about the best methods for protecting native biological diversity and ecosystem processes on both managed and unmanaged lands.
- 8) The input of conservation biologists on all these issues is essential.

Limitations

The approach outlined above is a vital supplement to traditional strategies of public land acquisition and wilderness designation. It is *not* a substitute for such actions. The public must begin to acquire critical tracts—especially large, unfragmented tracts.

And private land management for forestry and agriculture must improve dramatically to genuinely sustainable, low-impact levels.

Conclusion

For the past several years, we have heard numerous voices of selfishness parading under the banner of "property rights." At times the din has been so loud that it seemed almost as if *all* landowners were selfish, short-sighted, and hostile to basic community values. The landowner survey in New Hampshire exposes this falsehood and demonstrates that most landowners care for the land and for the rights of other species and future generations. Proponents of Wildlands in regions dominated by private land holdings can substantially enlarge potential reserves, for little if any money, by offering these caring landowners an opportunity to put their values to work in a coordinated, effective manner. At the same time, they will be striking a blow for landowner and community rights. ■

Jamie Sayen is the editor and publisher of The Northern Forest Forum (POB 6, Lancaster, NH 03584), and owner of a small tract of forest in northern New Hampshire.

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Easing Private Lands into Wilderness Networks

by Brian Dunkiel

Conservation easements should be used to protect functioning ecosystems that exist on private property. While the North American Wilderness Recovery Strategy is a long-term commitment, it is important to take advantage of the opportunity that conservation easements present us with today. (For background on conservation easements and land trusts, see *Wild Earth* fall 1995, page 62.) On-the-ground implementation of wilderness proposals is vital for spreading The Wildlands Project vision. The Wildlands Project should therefore endorse a program to facilitate cooperation among wilderness activists, scientists, land owners, and land trusts to conserve functioning ecosystems. Such a program could be seen as an integrated wilderness conservation strategy, involving as it would all types of people and all types of land.

An integrated wilderness conservation strategy would promote discourse with diverse groups who value protected lands for a variety of reasons. By

encouraging conservation groups, land trusts, and agencies to consider the values of biodiversity and wilderness as they target lands for easements, and by suggesting sound conservation management practices, the program would play a practical and important role in the realization of the broad aims of the North American Wilderness Recovery Strategy.

Conservation by acquiring the development rights to private property is rapidly growing, and local land trust organizations, the groups primarily responsible for easement acquisition, exist all over the country. For some land trusts, biodiversity protection is a prominent factor in determining which lands to protect. For others it is not—yet. An integrated wilderness conservation strategy would promote opportunities for wilderness activist groups to inform land trusts about wilderness proposals within their jurisdictions.

No matter what their purpose, most land trusts use fairly standard



Ermine by Bob Ellis

(boiler-plate) language to protect lands by easements. Land trust lawyers often reason that standard easement language, which has withstood court challenges, is more effective and efficient in the long run than crafting new language for each land parcel. This routine practice ignores that all land is unique—a fact recognized even by the sometimes archaic law of contract and the remedy of specific performance. The law generally regards each tract of land as unique and therefore impossible to duplicate.¹ The Restatement of Contracts—black letter contract law—recognizes that all tracts of land are unique. Specifically, in a dispute over a land sale, the injured buyer in the contract can ask for the land itself. This is known as specific performance, and is different from most contractual situations in that usually the injured party can only ask for money or other damages—not specific performance of the contract. So, if legal scholars have recognized that all land is unique, then land trust lawyers should as well. This would support more creative easement writing, designed specifically for the land at issue.

Easements drawn pursuant to an integrated wildlands strategy would recognize that all land is unique; easements would be tailored to protect functioning ecosystems. Ecosystems would be protected because activists, scientists, land owners, and land trusts would work together in project selection and easement design.

An integrated strategy would encourage land trusts to amend or write project selection and easement design criteria. New project selection criteria ought to consider a land's location on network reserve maps, in addition to traditional considerations, such as development threats.

Easement language should limit land usages according to the land's location in either a core, corridor, or buffer. Design criteria should be consistent with the objectives of network reserve design set out by Reed Noss:

(1) Represent, in a system of protected areas, all native ecosystem types and seral stages across their natural range of variation. (2) Maintain viable populations of all native species in natural patterns of abundance and distribution. (3) Maintain ecological and evolutionary processes, such as disturbance regimes, hydrological processes, nutrient cycles, and biotic interactions, including predation. (4) Design and manage the system to be responsive to short-term and long-term environmental change and to maintain the evolutionary potential of lineages.

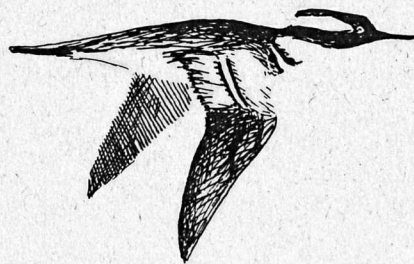
Accordingly, the easement would make clear that the landowner intends to conserve the land as "forever wild." Easements protecting cores and corridors would likely disallow resource extraction, while easements protecting buffers might permit environmentally benign forms of agriculture and recreation.

The need is pressing to introduce conservation biologists, land trust lawyers, property owners, and activists to each other. Doug Cornett, from Northwoods Wilderness Recovery (NWR), for example, has spoken to me about his interest in making conservation easements part of NWR's overall wilderness recovery strategy. It is time to match the science expertise of groups such as NWR with the legal knowledge of local land trusts (or local lawyers where no local land trust exists) to implement wilderness proposals.

The Land Trust Alliance National Rally, taking place this year in Burlington, Vermont (17-20 October), presents an excellent opportunity to begin this dialogue. Additionally, wilderness activists should attend to become better informed about conservation easements and land trusts presently protecting lands in their region. ■

Brian Dunkiel (POB 622, South Royalton, VT 05068) recently gained a degree in environmental law at Vermont Law School.

An integrated strategy would encourage land trusts to amend or write project selection and easement design criteria...to consider a land's location on network reserve maps...



¹Restatement (Second) of Contracts 12, § 360 (19__)

An Investigation of the Trade-off Between Jobs and the Environment for the National Forests of the Lake States Region*

by Daniel G. Cottam

Although many studies have shown that there is no trade-off between jobs and the environment on a national scale, reduction of timber outputs can have local consequences on levels of employment (Goodstein 1994). In the Pacific Northwest, the "jobs vs. owls" controversy generated widely varying estimates of the number of jobs that would be lost due to protection of ancient forests (Western Ancient Forest Campaign 1995). This controversy inspired me to investigate the relationship between jobs and the environment in the National Forests of the Lake States region: Minnesota, Wisconsin, and Michigan.

I took values for each variable from the alternative management plans described in the 1986 final environmental impact statements filed for these forests as part of the long-range management plans required under the 1976 National Forest Management Act. I noted the level of forest related employment predicted to result from forest operations, the level of timber harvest, and the area devoted to semiprimitive nonmotorized recreation (SPNM). I used the level of timber harvest as a variable indicating the level of human disturbance across the forest. I used the area devoted to semiprimitive nonmotorized recreation as an indicator of the amount of interior forest/remote habitat provided by the various management alternatives.

Interior forest habitat and remoteness were chosen as beneficial qualities because species requiring these have declined in abundance since the arrival of European settlers to the region. Some, such as the Cougar, have been extirpated from the region (Department of Natural Resources 1973). Others, such as the Wood Thrush, continue to decline as a result of human alterations to the landscape (Robinson et al. 1995). Gray Wolf populations are negatively associated with road density (Mladenoff et al. 1995). Fragmentation is the principal threat to most species in the temperate zone (Wilcove et al. 1986).

SPNM was chosen to indicate interior forest and remote habitat because the level of human disturbance in these areas is less than in the rest of the forest and roads are closed to motor vehicles. Interior forest and remote conditions are therefore more likely to be found in areas designated for SPNM than in the rest of the forest.

The jobs vs. timber harvest investigation revealed that there need not be an immediate reduction in employment associated with reductions in timber harvest. Predicted employment could actually be increased by 89 jobs (0.5%) for the region as a whole without reducing employment in any forest despite a six percent reduction in timber harvest for

* This is a brief synopsis from a Master's thesis deposited at Memorial Library at the University of Wisconsin-Madison. The author thanks Dr. Laurel Travis and Professors Donald Waller, Raymond Guries, Joseph Bongiorno, and Grant Cottam for assistance in the completion of the project, which was funded in part by the Conservation Biology and Sustainable Development travel fund.

the region. Selection of the plans with the lowest level of timber harvest resulted in a 35% reduction in harvest accompanied by an 8% reduction in employment.

The jobs vs. SPNM investigation produced similar results. An increase of 181 jobs for the region (1.0%) could be attained without reducing employment in any forest despite an increase of 19,000 acres of SPNM (1.6%) for the region. Selection of the plans with the most SPNM resulted in an increase of 301,000 acres of SPNM (25%) for the region accompanied by a loss of 872 jobs (5%).

In sum, this study revealed that modest reductions in timber harvested from the National Forests of the Lake States region need not result in decreases in employment. Harvest could be reduced by 6% with no reduction in employment at any forest, or by 13.7% with no associated drop in regional employment. Similarly, increasing the area devoted to SPNM did not cause an immediate decrease in employment. SPNM could be increased by 1.6% without reducing employment at any forest or by 17% without decreasing employment on the regional level. Combining constraints produced similar results.

The jobs numbers used in this study are predictions made by the Forest Service using IMPLAN. The accuracy of this study therefore depends on the accuracy of IMPLAN.

Moreover, the management plans presented in the environmental impact statements do not represent a broad range of alternatives. This study should therefore not be considered as an endorsement of any group of alternatives. If the range of planning was broader and more consistent between forests, this analysis would be more meaningful.

A trade-off between local jobs and timber harvest does exist, as does a trade-off between local jobs and SPNM. However, significant reductions in timber harvest or increases in SPNM can be made with little impact on local employment. If the forests are viewed on a regional basis as opposed to a forest basis, even greater reductions in timber harvest and increases in interior forest are possible without affecting regional employment levels. ■

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Daniel Cottam (4257 Doncaster Dr., Madison, WI 53711-3753) has a Masters in Conservation Biology and Sustainable Development from the University of Wisconsin-Madison. He is currently looking for a job while delivering pizzas.



The "Public" Institutions Twisting the Ear of Congress

by Michael Robinson

RANCHING AT THE CENTER OF THE "MY USE" MOVEMENT

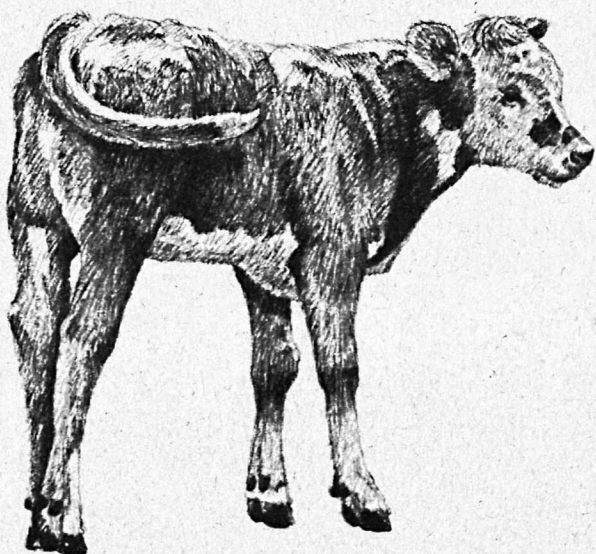
While skiing through the avalanche of pro-extinction legislation tumbling out of Congress, the conservation community must, as Dave Foreman and David Johns pointed out last year, also take the offensive. To be effective, we must understand why our message has not taken root with the voting public (as Dave's Summer '95 "Around the Campfire" elucidates), and the institutional basis for the political power of the Wise Use (AKA "My Use") movement. In a previous *Wild Earth* article,¹ I discussed state wildlife policy, and Sinapu's attempt to forge a state biodiversity policy. Herein, I'd like to expand that discussion to a general look at why it might appear from the behavior of elected officials that the majority of people in the public lands states of the West vehemently oppose rational conservation policies. To do so, I will mainly reference Colorado, a state with an urban, (relatively) ecologically-minded populace, led by anti-Nature elected officials.

The clearest look at the My Use movement must focus on the hegemony of ranchers in public lands policy. Ranchers have been at the center of efforts to privatize public lands—the heart of the My Use agenda—since the 1890s street protests in Denver and elsewhere in the country against President Grover Cleveland's creation of Forest Reserves (subsequently renamed National Forests). A century later, the My Use agenda remains the same, now incarnated as Senator Pete Domenici's Public Rangeland Management Act (S. 1459), which would make grazing the dominant use of Forest Service and BLM lands, divest the public of any meaningful participatory role in grazing decisions, and enshrine livestock grazing as a right, not a privilege. To understand why Congress pursues a virulent anti-Nature agenda, and why the Administration refuses to stand up for environmental laws, we must understand the role of ranching in the "political economy" of the West.

RANCHING OLIGARCHY DERAILS PRESIDENTIAL AGENDA

The President didn't stop after his masterful political campaign. With only a few days to regain his voice and catch up on sleep, William Jefferson Clinton followed up his election victory by striding into the adoring crowds at a southern California mall, the suburban heartland of his victory. Among the thousands of shoppers clustered around his anxious Secret Service entourage, probably not a single public lands rancher was present.

A few months later, Clinton's first budget included his promised increases in mining and grazing fees. The President, commanding a majority party in Congress, was on a roll. Observers were shocked subsequently when the President backed down on his budget in the face of protests of increased grazing fees by Western senators.²



¹ *Wild Earth*, Spring 1994.

² In the current presidential campaign, Clinton has again shown deference to the powerful ranching industry. A day after announcing a sell-off of federal petroleum reserves to lower gasoline prices for consumers, the Clinton administration outlined a policy of increased federal purchases of beef for school lunch programs that would raise the price of beef to benefit ranchers.

Then in the summer of 1993, when Interior Secretary Bruce Babbitt unveiled a series of minor public lands grazing policy changes misnamed Range Reform '94 (the policies didn't range very far, nor were they real reforms, nor were they implemented in 1994), it appeared the West spoke in unanimous rebellion against a tyrannical colonial government. Western senators (including those from North Dakota, where fewer than one hundred ranchers use public lands) successfully filibustered against even a watered down version of Babbitt's plan. Largely as a result, Babbitt weakened "Range Reform" even further, and then delayed its implementation until late 1995.

Rancher control of public lands policy flies in the face of the demographic and economic insignificance of ranching in every Western state. Colorado provides a good example. In this state of over three million human residents, fewer than three thousand ranchers graze their stock on public lands—less than one tenth of one percent of the state's population. Since even public land ranchers largely use private lands for their business, only 0.07% of Colorado employment and 0.04% of its income depend on public land ranching.³ Yet both Colorado's US senators and the governor claim ranching roots, and consider ranching support among their highest legislative priorities: Rancher-Senator Ben Campbell led the fight against "Range Reform"; the grandparents of Senator Hank Brown, himself a former executive of the Montfort meat packing company, were ranchers. Both Colorado senators are co-sponsoring Domenici's Public Rangeland Management Act. Governor Roy Romer grazes his livestock on state-owned and National Forest land, and played an instrumental role in forcing Bruce Babbitt to back down from his original proposal, in favor of a more ranching-friendly plan.⁴

Rancher control of public lands policy flies in the face of the demographic and economic insignificance of ranching in every Western state.

In fact, a survey of any Western state other than the Pacific coastal states will reveal the same dynamic: A peculiarly large percentage of high level elected officials claim ranching backgrounds. Babbitt himself, of course, came from a ranching family in Arizona. In the Senate, Max Baucus (D-MT), Malcolm Wallop (R-WY), and Larry Craig (R-ID) are all ranchers. How do ranchers so consistently elect their own to power, and why do even non-rancher senators (including such environmental proponents as former senator Tim Wirth) fight so assiduously for ranching interests?

The roots of ranching control lie in several factors, including the common view of the rancher as an amalgamation of the heroic, lone cowboy and the genially patriarchal aristocrat—an intense and irrational public devotion comparable to the old British view of their royal family.⁵ Ranchers' stature does not account for all, however. More important, through the exigencies of historical and geographical circumstance, ranchers created a series of institutions to help them tame the wild West. Today, those same institutions and the laws that uphold them serve to keep political power within ranching communities.

Unlike frontier miners, who operated largely in isolation (staking a claim and then guarding it from interlopers), ranchers had to cooperate to round up free-ranging stock, string barbed wire fences, kill wide-ranging predators, and build water storage reservoirs. Such cooperation facilitated creation of private cattlemen's associations (one doesn't hear about similarly functioning institutions for miners), as well as public bodies. It engendered a culture of cooperation, and dependency on government handouts.

It also resulted in state and federal laws largely designed to facilitate the flow of money and natural "resources" to private entities.

In modern times, along with the continued flow of such money come political connections—which in turn channel more money to the "grass-roots" of these networks. The institutions supported by these often arcane laws principally concern themselves with policies regarding water, wildlife, taxes and other fiscal mechanisms, and grazing fees. If we change the state and federal laws supporting the ranching establishment, three benefits will ensue: First, ranchers' political and financial clout will decline nationally, thus crippling the heart and soul of the My Use movement. Second, the national impression of a unanimous chorus of support for ranching emanating from the West will cease. Finally, the direct biological impacts of ranching and associated My Use causes will decline as saner national policies prevail. To change the laws that undergird ranching, we need to understand how these networks operate:

Water Conservancy Districts Are Political Machines

Water is the basis of almost all value in the arid West, not only sustaining ecosystem health, but also providing for most economic value. Whether in building suburbs or irrigating alfalfa (a primary livestock food), water—as the old saying goes—travels uphill toward money. But, money also flows downhill toward water; and state water laws, originally set up by and for ranchers and the irrigators providing them cheap cattle feed, continue to give ranchers disproportionate political power.

³ Dr. Thomas Powers, SUWA newsletter, Spring 1995.

⁴ See *Wild Earth*, Spring 1994.

⁵ See Lynn Jacobs, *Waste of the West: Public Lands Ranching* (1991) for an exposé of the ranching myth.

As Philip Fradkin noted in his 1981 book, *A River No More: The Colorado River and the West*, over three-quarters of the water used in the Upper Colorado River Basin goes to livestock feed. Getting water out of streams and rivers and onto pastures involves a lot of engineering and money—far more than that provided through the sale of hamburgers—so a special institution, known as the water conservancy district, was created to leverage federal funds into dam and canal construction. Colorado and California provided the prototype for water conservancy districts, though almost every Western state has them. Colorado's system, the most complex in the country, serves to illustrate how these districts work.

Empowered to tax all land owners within a region, Colorado's water conservancy districts are governed by an unelected board, whose members are appointed by judges. Those judges are themselves initially appointed by the governor, and only subject to election in their second and subsequent terms. In other words, two levels of political appointments buffer the water boards' decisions from public accountability.

Water conservancy districts are the grassroots mechanism for securing government funds to build dams and other water projects. Though they tax urban landowners with no interest in irrigation, their traditional constituents are ranchers who (along with irrigators which grow cattle feed) form the dominant interests on their boards. With broad authority and funding, water conservancy districts operate as a political machine, "spilling" patronage to create broad support. The Southwestern Colorado Water Conservation District, for instance, mobilizes support for the Animas-La Plata water project on those two namesake rivers. Disguised as a project to provide domestic water for the Southern Ute and Ute Mountain Ute Indian reservations, the project would also provide municipal water for five towns in New Mexico and Colorado—essentially a bribe for real estate agents and the political establishments of Bloomfield, Aztec,

Shiprock, Farmington and Durango. But the greatest share of the water will go toward irrigation on private, non-Indian lands. Most likely, that subsidized water will mainly grow alfalfa for cattle, giving ranchers an indirect but substantial interest in the A-LP project. Ironically, since the Utes have prior water rights, they could legally seize water now used by farmers and ranchers off the reservations. Indeed, the threat of the tribes appropriating water now being illegally used by only a handful of non-Indians drives much of the support for the Animas-La Plata project. Should the dam proceed, state money will supplement hundreds of millions of dollars of federal funds, all to suck up almost one-fifth of the remaining flow of the San Juan River, by de-watering its headwaters.

Water conservancy districts also mobilize their powers to influence elections. In a local county commission or state legislature race, this political machine can play a decisive role. Even without direct and formal involvement by the district, its officers' extensive contacts serve as a political base—which may be one reason why most county commissions in Colorado have ranchers on their boards, and why, until a few years ago, the state legislature had more ranchers than lawyers. These representatives diligently defend the undemocratic and Byzantine system of state laws that constitute their political roots, and sit on the committees (in Colorado that is the Agriculture Committee) that write the laws on water. When some of those state representatives go on to serve in the US Congress, they again seek out committees that allow them to fund water projects, and to otherwise represent their political bases in the ranching communities.

Thus Senator Campbell, whose membership in the "world's most exclusive club" grants him tremendous power, has stated that the Animas-La Plata project is his highest legislative priority. The two Endangered fish species in the San Juan River, which so far have

blocked construction of the project, apparently inspired Campbell's election campaign pledge to dismantle the Endangered Species Act.

Water conservancy districts not only help politicians acquire office, they also stand ready to assist the officials in power. One of Senator Brown's chief advisors on environmental issues, Greg Hobbs, is the attorney for the Northern Colorado Water Conservancy District and was recently nominated by Governor Romer to the Colorado Supreme Court. In 1993, Hobbs persuaded Brown to block areas in the South San Juans from Wilderness protection under the Colorado wilderness bill, because of "water rights" held by a local rancher. Such "rights" constitute a relatively new class of legal claims. In 1982, Interior Secretary James Watt issued an order abdicating assertion of public (federal) water rights on public lands, in favor of rules issued under state law—written by and for water conservancy districts and their rancher constituents.

State Wildlife Policy Assists Ranchers

Similar to water policy, wildlife policy in Colorado serves ranchers. Many wildlife laws were originally based on ranchers' desire to exterminate predators and rodents. Today, state law still charters local predator and rodent control districts. These districts serve two purposes. First, they set local regulations to determine which animal species can be authorized to live on private lands within their boundaries. If a land owner fails to exterminate a species of rodent designated a nuisance species by the district, the district's agents can enter the land, kill all the rodents, and bill the (perhaps unwilling) land owner. If that person refuses to pay, the land can be seized by the state. Predator and rodent control districts also raise money. These funds are pooled with money appropriated by nine counties throughout Colorado, along with money provided by the Colorado Division of Predator Control, the Colorado Division of Wildlife, and the national Animal Damage Control (ADC) agency.

Animal Damage Control spends millions of dollars to coordinate the work of killing animals between local, state, and its own employees. As is the case with water, such coordination engenders a network of informal and administrative relationships between local ranchers and trappers and state and federal officials. Those relationships provide ranchers with additional money, information, and access to elected officials. As far back as the 1930s, ADC (then called the Bureau of Biological Survey) used its extensive network of local and state contacts to squash a move to significantly cut its Congressional appropriations. More recently, the legislature passed and Governor Romer signed a bill transferring all control over "depredating wildlife" from the Colorado Wildlife Commission to the state Commissioner of Agriculture, who oversees the Division of Predator Control. Aside from changes in regulations governing predators, this may also serve as a conduit for the further transfer of funds toward killing predators. ADC would likely cease operations entirely in any state that did not partially match federal funds.

As another informal aspect of this network, the governor traditionally re-

serves for ranchers several seats on the Colorado Wildlife Commission, the governing board of the Colorado Division of Wildlife (DOW). Until recently, four out of the eight commissioners were ranchers, though that is now down to three, including the former wildlife chair for the Colorado Cattlemen's Association. Not surprisingly, the Wildlife Commission and DOW have been very hostile to endangered species protection. The Commission has consistently fought against including Colorado habitats in either a Gray Wolf or a Grizzly Bear recovery plan. DOW will not even write recovery plans for most of the state-listed endangered species, and often advocates against federal listings of species within Colorado. Nevertheless, in late November 1995, Governor Romer struck an agreement with Interior Secretary Babbitt to give a greater advisory role to state wildlife officials in decisions on conservation of sensitive species. While on the surface, full communication between government entities is laudable, once again ranching interests will have a seat with federal officials in back room decisions on conservation matters.

In short, ranching influence on state wildlife bodies weakens environmental policies and feeds money back into

rancher hands. The Commission and DOW are required by state law to reimburse ranchers for damage done by "game animals" to their private property (including livestock, even if grazing on public lands). DOW recently announced that in the absence of any information to the contrary, the agency will generally accept ranchers' damage claims at face value, without examining any evidence of actual damage. Clearly, the time invested by ranchers in serving on public boards and commissions pays for itself. But ranchers in the legislature believe that is not enough, and have introduced a bill (which has already passed the Colorado House as well as key Senate committees) to change the method for calculating "game damage" claims. The bill, HB 1027, appropriates just under a million dollars for the first year to pay for the increased damage claims anticipated under the new formula. This attempt to transfer hunting funds to ranchers amounts to "takings" legislation, holding wildlife hostage to the ability to pay for their use of habitat on private lands. If it passes, DOW will have even less money for species recovery programs, and maintaining all wildlife—"game" and non-game alike—will appear to "cost" more.



illustration by Martin Ring

Fiscal Policy Buttresses Rancher Control

Fiscal policy is perhaps the most powerful mechanism by which ranchers retain financial, and thus also political, power. Pro-ranching fiscal policy involves three broad types, direct subsidies, tax breaks, and improperly secured loans.

Most of the dozens of major subsidies to ranchers flow from the federal, not the state level. These range from the obvious to the obscure. Perhaps most egregiously, a large proportion of federal land management costs—including fence, road and water tank construction—subsidizes grazing permit holders or mitigates damage exclusively caused by livestock. In the obscure category falls the annual appropriation (almost \$30 million in 1994) to the Foreign Agricultural Service for the promotion of American agricultural products overseas (one of the smaller of several subsidies to boost overseas agricultural sales). This may appear trivial in both fiscal and political terms, but that is not how the ranching industry views this program. Overseas markets are *the* solution to the ranching industry's decades-long problem of Americans' growing dissatisfaction with beef. Thus the National Cattlemen's Association pushed hard for NAFTA authorization, and the new-born National Cattlemen's Beef Association (consolidating the NCA and the National Live Stock and Meat Board/Beef Industry Council) has put foreign market development at the top of its agenda.

As with existing water and wildlife policies, fiscal policies involve local-state-federal relationships that serve ranchers. Indeed, state institutions often serve as vehicles for federal payments. For instance, subsidized irrigation water from federal dams is sold directly to water conservancy districts, which then parcel it out to individual ranchers and other irrigators. State agricultural colleges, funded partially by the federal government, are chartered under state law to provide services for agricultural interests. These services often consist of prostituted biological information de-

signed to bolster ranching interests in federal land management controversies. In New Mexico, for example, the Range Improvement Task Force, a body chartered by the state legislature to assist ranchers, and funded by both the federal and state governments, provides skewed biological information that the Forest Service then uses as the basis for decisions on management of our public lands.

Below-market fees for public lands grazing have garnered the most attention from the media and casual observers as a subsidy, but even here the real scandal—and one of the keys to ranching political power—has been ignored: One-half of the grazing fee goes not to the federal treasury but back to grazing advisory boards to spend much as they please. Until very recently, these rancher-controlled institutions typically spent grazing fee money on such uses as killing predators and building fences and water developments. Though Representative David Skaggs (D-CO) removed statutory authority for the grazing boards in the 1994 Appropriations Act, Domenici's bill would revive them with a vengeance; and even Babbitt's "range reform" regulations include an approximation of the boards, albeit with some environmental representation, renamed "Resource Advisory Councils." In whatever capacity and under whatever name, grazing advisory boards will be dominated by ranchers; if the past is any indication, they will serve as mini-political machines, spending their money on ranching propaganda and other self-serving political interests. As with water conservancy districts and predator control districts, state laws regulate expenditures by grazing advisory boards.

In Colorado and many other Western states, agricultural land is taxed not at its assessed worth, but at a fraction of its value. Though this can help abate the transformation of open space ranches into residential development, it provides no permanent protection. In fact, many ranchers collect their tax breaks for years, waiting until the price is right to sell the ranch to housing developers. In

other cases, ranchers pay lower taxes even where there is no threat of residential development. Instead, tax policies should support explicit conservation goals, recognizing permanent conservation easements as the vehicle for lowering land assessments.

Tax breaks to ranchers may also subsidize other extractive industries. In Wyoming, for instance, large swaths of public land are leased by oil and mining companies for grazing. In these cases, corporations may graze public lands not primarily to produce beef, but to take advantage of agricultural tax breaks on their adjacent private lands, which otherwise would be assessed at the value of their subterranean reserves.* Oil and mining industries thus also have a direct stake in public lands grazing policies.

Perhaps the most insidious link between ranching and another industry involves the loans made to ranchers by banks. As Charles Bowden and Michael Binstein pointed out in *Trust Me: Charles Keating and the Missing Billions* (1993), if you owe me fifty dollars, I've got you over a barrel; but if you owe me fifty thousand dollars and your assets are worthless, you've got me over a barrel. Using this yardstick, many banks are "over a barrel," having issued substantial loans to ranchers, secured by the collateral of public land grazing permits. On the infamous Diamond Bar allotment of the Gila National Forest in New Mexico, a Texas bank that is part of the Farm Credit Administration issued loans to a rancher, using as collateral his permit to graze 145,000 acres of National Forest land (most within the Gila and Aldo Leopold Wildernesses). The rancher only owned 115 acres of land. When the Forest Service determined that livestock were destroying the riparian habitat of the Gila Trout, a federally listed Endangered species, and (reluctantly) proposed reducing stocking, the bank enlisted Senator Domenici to successfully pressure the agency not to reduce stocking rates, but to instead send bulldozers into the world's first protected wilderness to create sixteen huge stock tanks—essentially reservoirs—to draw

* In like fashion, Representative Wes Cooley (R-OR), the House sponsor of the Public Rangeland Management Act reportedly has used the agricultural assessment on his ranch to lower the tax burden for his manufacturing business.



the cattle out of the river channel. (Gila Watch and other environmental groups have so far kept the bulldozers out of the Wilderness.)

The Farm Credit Administration supervises a whole class of USDA-chartered agricultural lending institutions that are owned by the ranchers and other agriculturists who borrow from it. These federal land banks, started in 1917 with government seed money, issue tax-exempt bonds, most of which are bought by other banks and insurance companies. Hence, if the federal land bank system starts failing, it may precipitate larger failures throughout the nation's financial system. Banks everywhere thus have an interest in turning grazing lease permits, which the courts have long ruled are privileges that can be withdrawn in favor of public interests, into property rights. Likewise, attempts to reclaim public ownership of water flowing from public lands would be opposed by banks that have issued loans using this water as collateral. Perhaps that is why Babbitt, though he suggested retaining unclaimed water in public ownership, did not even try to reclaim the water given away since 1982.

Indeed banks play a major role in supporting the ranching agenda in public policy. At Babbitt's May 1993 grazing hearing in Grand Junction, Colorado, several banks submitted testimony vehemently opposing a raise in the grazing fee and other changes in grazing policy. Senator Domenici's Public Rangeland Management Act would prop up these imprudent banks and ranchers by forbidding reductions in permitted grazing on public land allotments that have been so mortgaged (thus putting legislative imprimatur on the idea of grazing permits as private property rights).

State and federal funds also support the banking-ranching nexus. The Colorado Agricultural Development Authority, for example, issues tax-exempt bonds to banks for the amount of loans the banks make to ranchers and other agriculturists. Because the bank does not pay federal tax on the interest from the bonds, it can offer interest rates substantially below commercial rates. But rather than pay the bank back directly, the rancher pays off the loan to CADA, which then pays back the bank—with interest. This mechanism ensures that the

state agency assumes the risk if the rancher fails to make payments. Between the tax-exempt bonds and the bankers' no-risk guarantee, ranchers have access to capital not always available to other private business interests. The banks, of course, support ongoing expansion of the agricultural sector, no matter what the environmental costs, to continue making these safe and profitable loans.

The links between banking and ranching interests coincide in Representative Wayne Allard (R-CO), a Senate candidate who has introduced legislation to give away the BLM lands to the Western states and who has fought against minimum in-stream flows for water on Forest Service lands. Allard even went so far as to introduce legislation requiring all National Forest planning documents to be amended if they have the intended or inadvertent result of protecting a population of any animal on National Forest lands! The congressman, himself a large animal veterinarian from a rural area, has hired a bank executive, Mike Bennett, to represent him on environmental issues.

CONCLUSION

The ranching establishment employs many other public mechanisms to exercise political power within local communities, each serving as part of the base of a national political pyramid. For instance, USDA's Natural Resource Conservation Service (formerly Soil Conservation Service) provides financing for locally run "conservation" programs, which typically serve as aids for, or mitigation of, ranching. One of the programs run by NRCS is a class of agencies called Resource Conservation Districts, chartered to provide (among other services) public education about conservation issues. However, RCDs are selective about their education: An RCD in southern Colorado refused to sponsor a slide show about wolf recovery, terming it "too controversial," until forced to do so by the Conservation Service state office. Such institutions, which are not generally viewed as ranching oriented, allow local community organizers to use federal funds to further ranchers' political agendas.

Within state legislatures, most of these mechanisms are only understood by their beneficiaries—the ranchers who employ them for their own advancement and those who serve a ranching constituency. Ranchers who do not themselves sit on the multitude of boards, commissions, and elected offices that provide their livelihood, understand whom to talk to keep their subsidies flowing; their reliance on the public trough engenders a constant political engagement that has become the dominant icon of ranching culture, beyond even the barbed wire fence, the pickup truck or the rifle in the cab.

Ranchers are very politically active for another reason as well. Ranching is seasonal work. In the spring and fall, ranchers labor very hard, but throughout the rest of the year, with the aid of massive subsidies which keep them from having to work out in the field, many ranchers become part-time lobbyists.

Emphasizing ranching culture is not to dismiss the larger corporate interests that constitute the majority of ranching operations. But between banking and oil company lobbyists representing the larger financial interests in public lands grazing, and sophisticated "family farmers" who can trot out old pickup trucks for public admiration, the institutions that serve the ranching establishment are as carefully concealed as they are pervasive.

Over the last three decades, much of the conservation community's resources has gone to pressure Congress to protect public lands. Meanwhile, the My Use movement has made full use of community institutions which are buttressed by federal and state funds and often chartered under state laws. Just as the Christian Coalition uses fundamentalist churches within communities as political launching pads, so ranchers use water conservancy districts, predator control districts, grazing advisory boards, banks and similar institutions to siphon money, disburse patronage, and get their message out to the masses.

With work, however, wildlife proponents can overturn this system. Urban legislators can be educated about these abusive institutions and urged to sit on the committees writing the laws governing them. On the federal level, allies can be found among fiscal conservatives by advocating budget cuts targeted not only at environmentally damaging programs, but at seemingly unrelated subsidies, such as loan guarantees and agricultural export promotion programs.

On the state level, initiative campaigns can strip funding from indefensible programs like predator control boards, or can mandate the election of water conservancy board members, thus opening these institutions to greater public scrutiny. State laws governing corporations can even be amended to prevent public property from being used as collateral in private business transactions. By refocusing on state legislatures and laws, and

changing the operating rules of the state-chartered vehicles for community organizing, conservationists can change the ground rules—and the key players—in the national debate over our public lands. ■

Michael Robinson is executive director of Sinapu, Colorado's wolf recovery and ecosystem restoration group. Sinapu, named after the Ute word for "wolves," can be reached at POB 3243, Boulder, CO 80307; (303) 447-8655.

The spring 1996 issue of Sinapu's publication, Colorado Wolf Tracks, reports that the US Senate has passed Domenici's Public Rangeland Management Act, SB 1459. Sinapu warns that the House will probably also approve the bill, and urges readers to tell President Clinton (White House comment line 202-456-1111) what they think of the act.



illustration by Martin Ring

The Bullmoose Party

by PJ Ryan



People have occasionally asked where your kindly editor stands politically, as *Thunderbear* commentary seems to be all over the political map. Republican? (No.) Democrat? (Not bloody likely.)

I am a proud member of the Bullmoose Party, founded by Theodore Roosevelt in 1912. There aren't many of us left, which is a pity.

The Bullmoose Party was the closest thing to a successful third party that this country has seen. It grew out of a conjunction of political forces that have an eerie resemblance to present day politics; that is, weak, ineffectual Democrats and arrogant, reactionary Republicans.

Former President Roosevelt believed that the ideals of his "Square Deal" had been abrogated by his successor, President Taft, whom he believed, rightly or wrongly, to be favoring the strong over the weak, and that the nation's natural resources were being systematically looted. Roosevelt called for greatly expanded welfare programs and government regulation of industry, the elimination of injustice, the creation of equality of opportunity, and the conservation of the environment, and believed that the judiciary's primary obligation was to protect human welfare rather than private prop-

erty. (It is ironic that Theodore Roosevelt, dead in his grave at Sagamore Hill National Historic Site for 76 years, seems to have more political pizzazz than Clinton, Dole, or Gingrich!)

Naturally, the Republican Party of 1912 wasn't buying this and Roosevelt lost out to Taft in the Republican primary. Undaunted, Teddy founded his Bullmoose Party. (He called it that, he said, because he felt like one.)

The Bullmoose Party carried California, Michigan, Minnesota, Pennsylvania, South Dakota, Washington, and 27% of the popular vote, enough to lose the election for Taft and win it for the Democratic candidate, Woodrow Wilson.

Today, however, it would seem that a present day Bullmoose environmental party could go all the way against sniveling, ineffectual Democrats and arrogant, reactionary Republicans. I wonder who the standard bearer might be? ■

PJ Ryan works for the National Park Service and publishes "the oldest alternative newsletter in the federal government" (Thunderbear, POB 2341, Silver Spring, MD 20915, \$13.50 per year). The article above is from the July 1995 issue (#178).

Ecosystem Integrity, Sustainability, and the "Fish Wars"

by Laura Westra

FISH WARS

Conservation officials, as well as environmental ethicists and conservation biologists, talk often these days of ecological integrity and ecosystem management. For the new language and the emerging paradigm to be meaningful, however, the ethics of "integrity" and of the ecosystem approach must provide practical guidance for public policy; they must suggest ways to support sustainability for all and fairness in dealing with those who are vulnerable. In a world where hunger is the constant companion of millions, primarily in less developed countries, and malnutrition is too often the lot of the poor even in the richest nations, global policies to support food production and fair distribution must remain a primary concern.

Oceans and other large water bodies that could alleviate global hunger are becoming increasingly polluted and over-exploited instead. Exemplifying these problems, Canada has recently been the site of two major controversies, or "fish wars," one of which nearly turned to violence. In the 1980s, Newfoundland fishermen slowly reduced their cod stocks, with the complicity of provincial and federal governments more interested in present votes than future sustainability. In spite of the dire predictions of scientists, the fishers continued to push for increased quotas, with the misplaced confidence that the fish would somehow always be there. In 1992, the cod population crashed, depleted beyond possible recovery for the foreseeable future. Fishery crashes may well become a common occurrence, if ecological requirements such as the ones suggested by the principle of integrity are not followed (Hutchings and Myers 1994; Sea Shepherd Log 1994).

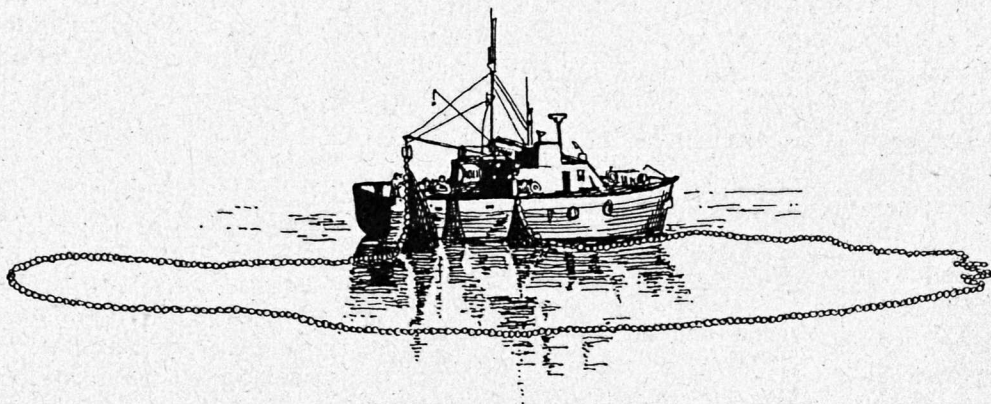


illustration by Sarah Lauterbach

The principle of integrity (PI), recognizes a) the interrelation between human and non-human nature and their "connaturality" and kinship; b) the intrinsic value of natural/evolutionary processes (Karr 1995; Kay and Schneider 1995; Ulanowicz 1996); and c) the foundational value of life-support systems for ecological sustainability (Goodland and Daly 1995). It also acknowledges that d) ecological sustainability is primary, as it alone supports economic and social sustainability (Goodland 1994; Westra 1995). Therefore e) at the most basic level, that is, at the *life* level—the dichotomy between anthropocentrism and non-anthropocentrism is false. "Preferences" sometimes address want-interests, sometimes need-interests; but at the basic, survival level *only*, we have no interests that are completely separate from those of all other life, so their "values" and our "values" coincide.

The problem erupted again in March 1995, this time accompanied by international conflict and legal disputes. The fish in question was turbot (haddock). On 10 March 1995, the story burst out on the front page of Canada's national newspaper, *The Globe and Mail*:

Four warning bursts of machine gun fire across the bow brought the Spanish trawler Estai to a halt after a four-hour chase through the foggy Atlantic....

The problem was one of overfishing beyond the 200-mile limit in the Grand Banks off the coast of Newfoundland. Use of guns in defense of fish stocks is almost unprecedented in Canadian history; but Newfoundland's premier, Clyde Wells, argued that Canadians in many fishing villages have had to watch their communities slowly die as European vessels fished large amounts of cod and flounder from 1988 to 1993, and have seen Spanish vessels take as many as 50,000 tons of turbot over the last three years, despite Canada's own 16,300 ton limit (and the Spaniards' legal limit of only 3400 tons).

The Spanish trawler *Estai* was hauled in, its crew returned to Spain, and its captain jailed until the ambassador of Spain posted the \$8000 bail for him. Fisheries Minister Brian Tobin had the unqualified support not only of the fishing villages but also of Prime Minister Jean Chretien, and all of Canada, notwithstanding the strong condemnation by EC officials and the charges of "piracy" levied against Canada.

For our purpose, the most important aspect of the controversy was captured by the wording on a placard waved by one of the 6000 demonstrators waiting for the captured ship to dock. It said, "This is a WORLD Fishery, not a Spanish one" (*Globe and Mail* 3-13-95). These sentiments were echoed by Newfoundland's premier, who insisted Canada is acting "on behalf of the international community" as it moves to punish and eliminate these activities, which are "an offense to mankind."

Increased quotas, even if sought to support traditional lifestyles, do not necessarily constitute a desirable "value." For

instance, although native people in the Amazon have claimed to be living harmoniously with nature and they are indeed less disruptive to natural processes than commercially exploitative foreign practices in the area, their goals and those of conservation biology do not necessarily mesh (Redford and Stearman 1993). Canada and all other countries must learn to gradually reduce their overall economic goals, else they will face complete extinctions of specific fish and of *their traditional lifestyles*.

From the scientific perspective of an ecosystems approach (and of complex systems theory), there is no guaranteed "safe," sustainable commercial catch and no clear linear causality between the overfishing of, say, cod and its extinction (Ulanowicz 1996). Climate changes, increases in UVB because of ozone depletion, and increased pollution from dumping in the oceans and toxic precipitation are all contributing causes, too. Hence it is not acceptable to argue for high catch limits on the basis of earlier quotas.

Further, neither Canada nor any other country should simply focus on the economic aspects of a natural "resource." The value of natural ecosystems far transcends this narrow view, as plants and animals all fulfill specific functions which are lost if the species go extinct, or even if their numbers fall below those necessary to fill their niche.

In a discussion of ecosystems and sustainability in fisheries, Hammer et al. (1993), explain:

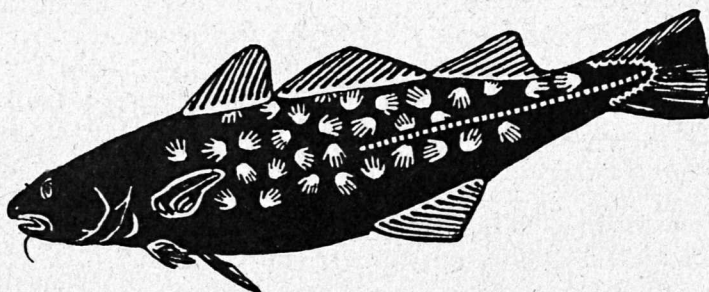
Whereas species diversity is a property at the population level, the functional diversity, what the organisms do and the variety of responses to environmental changes, especially the diverse space and time scales to which organisms react to each other and the environment, is a property of the ecosystem.

To view ecosystem health only as instrumentally valuable is to ignore the larger picture and the life-support and benchmark functions of the wild, in landscapes of appropriate geographical size (biomes). Hence, primary concern should focus on the wild (core areas), even when sustainability is the issue in question (Noss and Cooperrider 1994). Sustainable agriculture, sustainable forestry, and sustainable fisheries will not follow unless sustainability of wild ecosystems is addressed first. This long-term perspective has been anticipated and in fact *required* by North American and global regulations and treaties, all of which include future generations in their reach.

In essence, there is a basic difference between landscapes *utilized* (however carefully) for the implementation of human goals—thus *managed* rather than protected, and accorded only instrumental value—and those left wild. The latter can be valued both for themselves and as the basis of all other "goods." Wild landscapes support not only the biota within them, but also indirectly the life of everything else. Such a concept of ecosystem integrity is now present in The American Fisheries Draft Position Statement on Biodiversity (Winter and Hughes 1995).

In sum, the ethics of integrity requires embracing 1) principles of respect and preservation for wild (that is unexploited) areas; and 2) protection of ecosystems for their own intrinsic value and to permit them to maintain their life-support functions. These first-order principles in turn entail second order rules: 3) restraints on all technological activities involving toxic, hazardous, or genetically manipulated substances, which should not be permitted if there is any chance they might have a negative or an unpredictable impact on core and buffer areas; and 4) acceptance of additional limits to human "culture" activities, that is, to all non-basic human wants, through a) zoning regulations, and b) qualitative and quantitative regulations regarding the use of so-called natural resources. This last implies that limits must be imposed on *how much* can be taken, as well as *what* can be taken, from the standpoint of ecological sustainability.

To return once again to the "fish wars," here we have traditional lifestyles at stake. People have lived by fishing from time immemorial. No doubt, fishermen in both Newfoundland and Spain can reach back through generations to show their traditional dependence on the bounty of the seas. But fisheries have not remained "traditional" in either techniques or sizes of catches. Faster, bigger boats, huge nets, radar, and other new technologies ensure larger and larger catches for multiplying humans with steadily expanding demands and often with incomes to sustain a wasteful lifestyle—until fisheries crash. Already, many areas are too polluted for continued use, and this double-hazard scenario of overfishing and pollution is repeated all over the world.



As an alternative for *some* sort of fish-dependent subsistence, many nations are turning to aquaculture; but the environmental prognosis for this growing industry is not good. In short, if we turn away from natural fisheries and their losses, and try to supplement them through aquaculture, we open the door to another set of environmental problems, including destruction of mangroves in the tropics, organic pollution of coastal areas, and displacement of what few sustainable local fishing cultures still survive. Thus, overfishing may be forcing us to yet another hazardous and unsustainable option. "Aquaculture is the aquatic counterpart of agriculture" (Beveridge, Ross, and Kelly 1995). Largely because of the problems of natural fisheries over the last twenty years, aquaculture has increased exponentially, and now accounts for 17% of the world's fish harvest.

Like agriculture, aquaculture has deleterious effects on the environment and on human health. It affects biodiversity in several ways: a) "through the consumption of resources"; b) "through the transformation process itself"; and c) "through the production of wastes" (Beveridge et al. 1995). Its effects on biodiversity are both direct and indirect. Releasing "exotic genetic material into the environment" is a direct impact, changing "the biotic components of an ecosystem," thus indirectly causing possible loss of habitats or alterations in ecosystem functions (Beveridge et al. 1995).

In conclusion I have argued for the ethics of integrity and for strict regulations, including reduced quotas, to resolve "fish wars." Also needed are large marine reserves, off-limits to fishing, parallel to the continental reserves proposed by The Wildlands Project (Noss 1992). The Sea Shepherd Conservation Society's account of the global "fish wars," although far less favorable to Canada's interventions, *also* suggests drastic world-wide regulations to redress the problem (Sea Shepherd 1994).

Neither "values" embodied in entrenched lifestyles and occupations nor any other "national vision" will

illustration by Sarah Lauterbach

resolve the "fish wars." What was required in the Grand Banks in March 1995 was precisely what happened: the imposition of a multinational, global regulation, supported by law, but also by force, if necessary. In the future, however, such forcible stoppage of overfishing should be based on the needs of all life for wild ecosystems, not the narrow economic interests of any one nation. ■

Laura Westra, Ph.D. is an Associate Professor at the University of Windsor (Department of Philosophy, Windsor, Ontario, N9B 3P4 Canada) and author of An Environmental Proposal for Ethics: The Principle of Integrity.

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Dependence Day

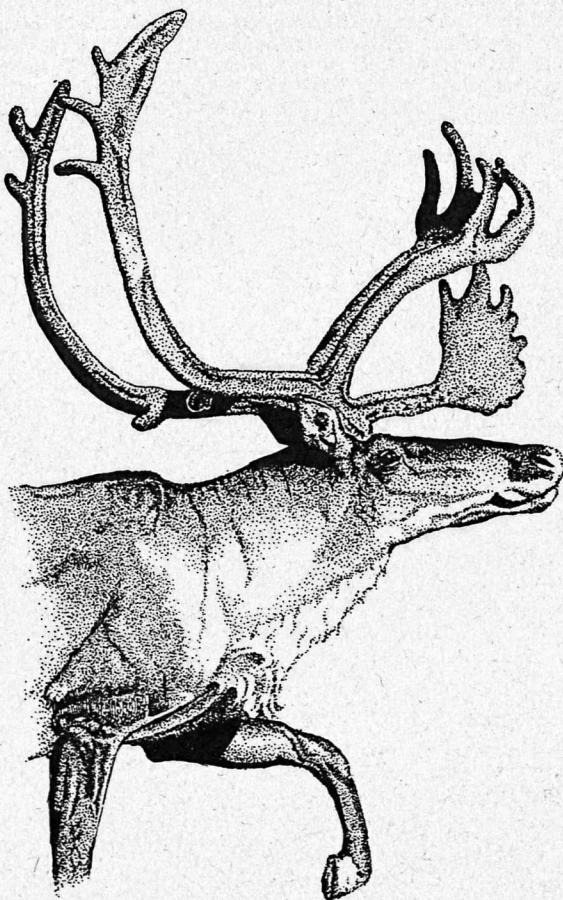
*It would be a quieter holiday, no fireworks
or loud parades, no speeches, no salutes to any flag,
a day of staying home instead of crowding away,
a day we celebrate nothing gained in war
but what we're given—how the sun's warmth
is democratic, touching everyone,
and the rain is democratic too,
how the strongest branches in the wind
give themselves as they resist, resist
and give themselves, how birds could have no freedom
without the planet's weight to wing against,
how Earth itself could come to be
only when a whirling cloud of dust
pledged allegiance as a world
circling dependently around a star, and the star
blossomed into fire from the ash of other stars,
and once, at the dark zero of our time,
a blaze of revolutionary light
exploded out of nowhere, out of nothing,
because nothing needed the light,
as the brilliance of the light itself needs nothing.*

—John Daniel

The Caribou Commons

*A Project to Protect the Caribou of Manitoba**

by W.O. Pruitt (Editor)



INTRODUCTION

All Caribou in North America are considered to be the same species, *Rangifer tarandus*, although they do form several subspecies of varying degrees of distinction. Caribou are gregarious and usually form bands of 10 to 50 individuals or loose herds often larger than 1000 animals (Banfield 1974).

BARREN GROUND CARIBOU

Rangifer tarandus groenlandicus typically make long migrations between the summer range on the tundra and their winter range in the taiga. In recent years the number of Barren Ground Caribou appears to have increased (Klein 1971). This may be due to a decline in hunting pressure, or it may reflect improvement in sampling methods such that more are being counted.

The Barren Ground Caribou are normally out of the range of direct human influence. Factors with the greatest influence on Caribou numbers are climate, predator populations, hunting, and changes in vegetation (Klein 1971). Currently, much of the winter range of Barren Ground Caribou remains relatively natural. In Manitoba, the forest-tundra and northern parts of the taiga that the Barren Ground Caribou use during winter are not economically viable for forestry, consequently little or no fire control is exercised there unless human habitation is threatened.

WOODLAND CARIBOU

Rangifer tarandus caribou are generally found in the taiga all year round, although many Woodland Caribou of the Cape Churchill (Manitoba) group spend considerable time on the tundra (Campbell 1994). Their diet consists of whatever vegetation is available at the time, with lichens, sedges and green vascular plants being preferred (Darby 1979).

Woodland Caribou are sedentary or their movements between summer and winter ranges are relatively short, usually less than 50 kilometres (Darby and Pruitt 1984). During winter the Caribou are gregarious, but individuals scatter in spring. Large patches of stable-age or "old-growth" coniferous forest with a minimum of edge are necessary for Woodland Caribou (Johnson 1993). In recent historic times, Caribou did not, as far as we know, use the grassland region.

* Boreal Ecology (1995) Class Project: This document is the latest in a long series of annual projects by my IV Year Honours Zoology class in Boreal Ecology at the University of Manitoba. It may be the most important of all because it fits Manitoba into the continent-wide context of The Wildlands Project. The Boreal Ecology class this year consisted of Allan Benoit, Ryan Brook, Greg Dyck, Ian Gilchrist, Lori Nichols and Heidi Wiebe. My role has been, as usual, instigator, gadfly, devil's advocate and editor.

Woodland Caribou have suffered a considerable decline since the early 1900s (Bergerud 1974). Although there is vigorous debate over the exact cause of this reduction, most agree that it is human-related (Bergerud 1974; Johnson 1993). Humans have indirect effects through logging (Cumming and Beange 1993) and increased forest fires (Schaefer and Pruitt 1991), and direct effects in the form of hunting (Jackman 1973). Currently the greatest problem for Woodland Caribou is habitat loss (Bergerud 1974).

It appears that Woodland Caribou cannot tolerate human disturbance in any form. Development in southeastern Manitoba has resulted in almost complete extirpation there. This may also be due to the nematode *Parelaphostrongylus tenuis*, which has become a serious problem following the rise in White-tailed Deer numbers (Edmonds 1991).

Other than regions of local population extirpation, the range of Woodland Caribou in Manitoba has not undergone any significant permanent changes (Johnson 1993). Therefore, if the habitat lost to fire, forestry and human development is allowed to return to its natural state, Caribou will likely repopulate these areas.

Traditional Use

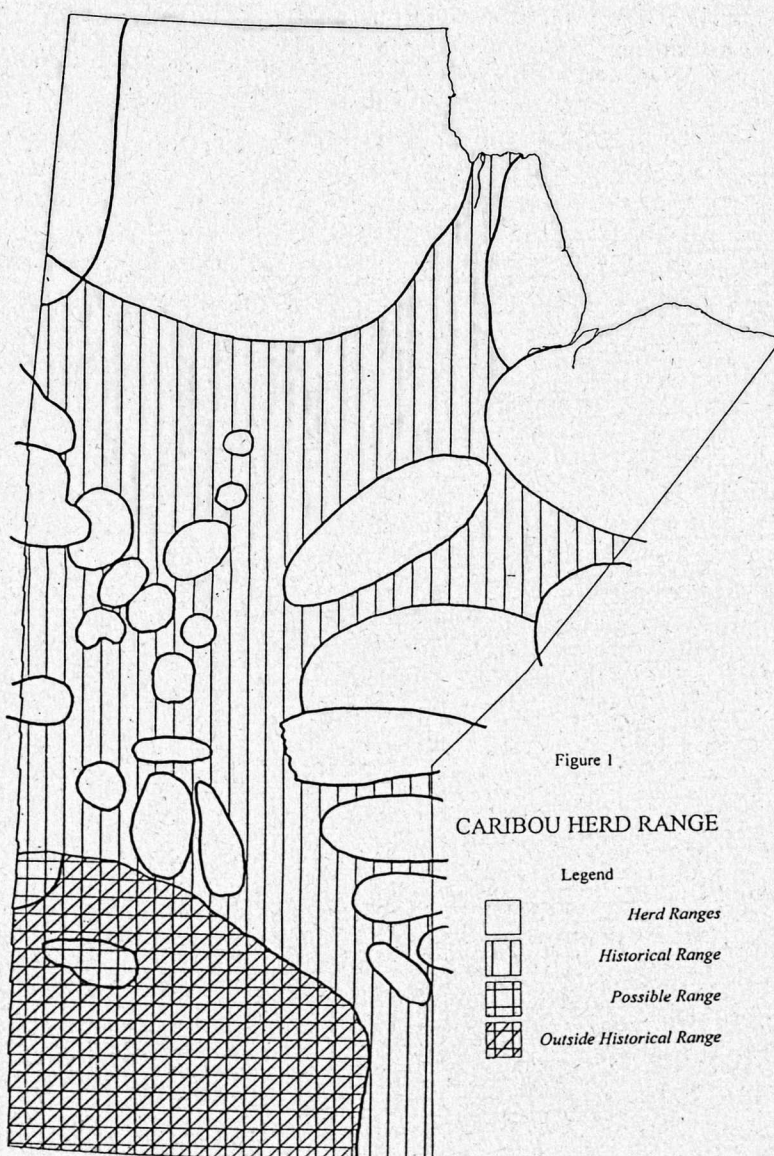
Traditionally, Caribou were a major part in the diet of Inuit, Chipewyan, and Cree peoples. Scattered bands of nomadic hunters using primitive weapons have, in recent decades, however, been replaced by hunters based in settlements and firing high-powered rifles from snowmobiles, motorboats and aircraft (Miller 1987). Barren Ground Caribou are especially vulnerable because they live in the open and travel in large, conspicuous herds. Their traditional migration routes make them especially easy to locate at certain times of the year (Bergerud 1974).

Caribou Range

Before the arrival of Europeans, Woodland Caribou ranged over most of Manitoba except the southwestern corner of the province. While some 27 Woodland Caribou "herds" are believed to remain in the province, they have been extirpated from their historical range in southeastern Manitoba (Johnson 1993; Figure 1). Barren Ground Caribou of the Beverly and Qamaniruaq herds migrate into northern Manitoba to winter in the taiga and forest-tundra. The Cape Churchill and Penn Island herds are questionable as to their subspecific status (Campbell 1994). Of historical interest is the question of whether Woodland Caribou ever inhabited the Duck Mountains and Riding Mountain regions of the Province.

Forest Fires

Fire is a part of the natural ecosystem in Manitoba, recycling plant communities. Natural fires result in a mosaic of uneven-aged forest stands. Burned areas contain many deadfalls which severely limit the movement of Caribou, thus decreasing their use of these areas (Schaefer and Pruitt 1991). Bergerud (1974) postulated that fire can create a habitat mosaic with suitable areas becoming available on a rotating basis. This can only occur if the fire cycle is considerably longer than the present 50-80 years. Because forest fires can make large areas unsuitable for Caribou, more land must be set aside for them to meet their minimum requirements than calculations of simple animal intake/habitat production would suggest (Schaefer and Pruitt 1991).



NATURAL REGIONS

Manitoba is 650,000 square kilometres in area, generally of low relief, rising gradually from sea level along Hudson Bay in the northeast to over 600 metres elevation in the southwest. The Precambrian Shield extends from the southeastern corner northward along the east side of Lake Winnipeg and beyond its north end. The Shield rarely exceeds 30 metres in relief and lies between 120 metres elevation in the southeast and 240 metres in the northwest.

Manitoba can be divided into 12 natural regions: Arctic Tundra, Northern Transition Forest, Hudson Bay Lowlands, Precambrian Boreal Forest, Manitoba Lowlands, Aspen/Oak Parkland, Western Upland, Souris Till Plain, Tall Grass Prairie, Turtle Mountain, Pembina/Tiger Hills and the Assiniboine Delta. These have been described by Manitoba Natural Resources (1992). We will only consider the regions of importance to Caribou.

Arctic Tundra

This natural region lies primarily along the coast of Hudson Bay in the northeastern corner of the province. The area is mainly flat with scattered rock outcrops. Palaeozoic sedimentary and Precambrian igneous basement rock predominates.

"Low Arctic" conditions prevail in this region and tundra communities cover upland areas (Shay 1984). The region is carpeted with vegetation composed of lichens, mosses, sedges, rushes and patches of grass. Dwarf Black Spruce (*Picea mariana*), White Spruce (*P. glauca*), Tamarack (*Larix laricina*), willows (*Salix spp.*), birches (*Betula spp.*), Jack Pine (*Pinus banksiana*) and Trembling Aspen (*Populus tremuloides*) occur in scattered groups (Miller 1987). Permafrost limits drainage, resulting in very wet ground and scattered lakes.

In Manitoba, the Arctic Tundra region is almost exclusively Crown land, with almost 50 percent of it comprising the Cape Churchill Wildlife Management Area. Although part is being considered for National Park status, the CCWMA is also being considered as part of the impact area for the proposed "spaceport" east of Churchill. (See discussion under Hudson Bay Lowlands.)

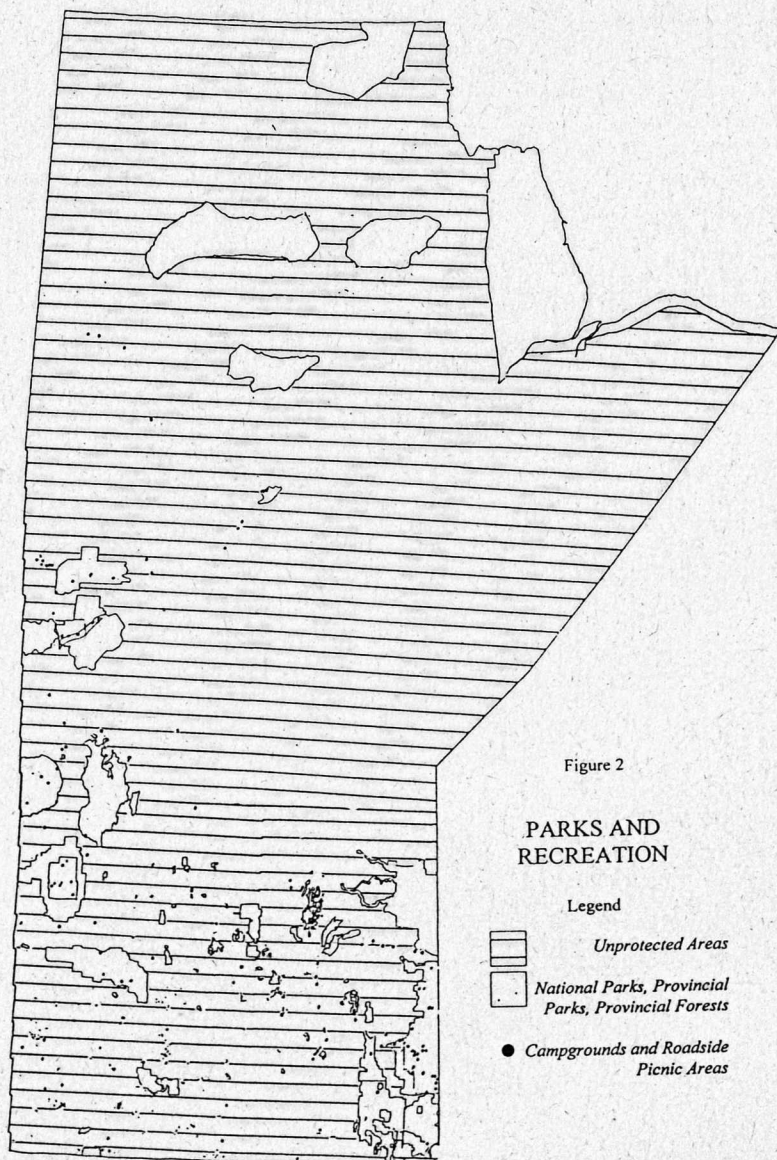
Northern Transition Forest

This region lies south of the tundra and north of the closed coniferous forest and is the third largest region in Manitoba. (It should not be confused with the mixed deciduous/coniferous forest of the northeastern US and southeastern Canada, which south of the border sometimes is given the name of Transition Forest, but is more often called Acadian Forest in the Maritime Provinces.) The region is underlain by Precambrian rock covered with a thin layer of glacial till. There is considerable evidence of glacial activity.

Climatic conditions are rigorous and permafrost is widespread. The vegetation consists mainly of low shrubs and scattered spruce with an underlying mat of lichen. Lichens are an important winter food for the Caribou. Muskegs and bogs are common throughout. Moving northward through this region, the upland forest becomes more sparse and the trees more stunted and deformed until they disappear, giving way to the tundra.

Hudson Bay Lowlands

Thick deposits of glacial and marine clays overlie Palaeozoic sediments of this region (Thomasson et al. 1980). It is generally flat and contains vast amounts of peat. The entire region is still rebounding, south to north, from the weight of the continental ice sheet, resulting in a series of abandoned beach-ridges differing in age. Very low (recent) beach-lines tend to be covered with



peat. The high (older) beaches are well-drained and have large trees and abundant lichens.

This region is included within the limits of "Akjuit," the proposed "spaceport" east of Churchill. The spaceport would subject the region to overflights, sonic booms, and fuel leaks (solid as well as hydrazine) from rockets as large as Taurus (72,800 kg) and Delta III (230,000 kg).

Precambrian Boreal Forest (taiga)

This is the largest natural region in Manitoba, covering almost 40 percent of the province. The podzol soil is underlain by Precambrian rock of several types, sedimentary as well as igneous. Glacial till covers the bedrock in many areas, often forming eskers and other glacial deposits. White Spruce, Black Spruce, Tamarack, Jack Pine and Balsam Fir (*Abies balsamea*) are well adapted to this environment. Lakes, streams and bogs are common features of the landscape.

This region is under extreme pressures from clearcut logging (for dimension lumber and pulp), fires, sports hunting and aboriginal hunting. Manitoba's only Provincial Wilderness Park is in this region. Since the park was established, the rate of environmental pillage in it has actually increased: mineral prospecting, fly-in angling and sports hunting camps, leasing of lakes for commercial exploitation of wild rice (with accompanying use of rice machines and chemical fertilizers and herbicides) as well as ditching, damming, and blasting drainage channels through rock ridges.

Manitoba Lowlands (taiga)

This region is underlain by Palaeozoic sedimentary rocks covered by deposits of glacial till and glacio-lacustrine silt and clay. Low-lying swamps and bogs are common. Ancient beach ridges mark the past existence of Glacial Lake Agassiz.

This region is undergoing intensive exploration for possible mineral deposits, undoubtedly because part of it has been proposed for National Park status.

PROTECTED AREAS

The types of parks and "special places" in Manitoba include National Parks, Provincial Parks, Provincial Forests and Wildlife Management Areas. Many of these areas must meet the demands and objectives of several conflicting interests: tourism and recreation, timber-cutting and mining, or untouched wilderness for the preservation of species.

National Parks are intended to preserve representative natural areas of significance for the benefit of present and future generations (Watkins 1990). Management in these parks is to reduce interference with natural processes by creating 5 zones with different intensities of use: a special preservation zone, wilderness zone, natural environment zone, outdoor recreation zone and a park services zone. Commercial exploration, extraction or development of natural resources are generally not permitted, but sport angling, cottaging, commercial development (general services, lodges and outcamps),

Manitoba is one of the worst provinces in Canada for protection of parks from commercial exploitation.

water control structures, utility and transportation corridors and travel by motor boats (but not off-road vehicles) are allowed (Watkins 1990). At present Manitoba has only one National Park, Riding Mountain. Part of the Cape Churchill Wildlife Management Area and a tiny bit of the Manitoba Lowlands are being considered for National Park status.

Provincial Parks are expected to meet the demands and objectives of several conflicting interests, similar to National Parks. Manitoba has 58 Provincial Parks under 7 different classifications: Natural Parks, Wilderness Parks, Recreation Parks, Heritage Parks, Recreation Trailways, Recreation Parkways and Recreation Waterways, each with a different purpose and degree of human activity (Manitoba Natural Resources, Parks). Manitoba allows forestry, fisheries management, mining, hunting, wild rice harvest, cottaging, commercial development, water control structures, utility and transportation corridors, some agriculture and all forms of mechanized travel in its Provincial Parks (Watkins 1990).

The present Provincial Government has proposed new park guidelines that give primacy to commercial uses over park values. Boundaries of present parks, and new parks, will be adjusted to eliminate all areas with even slight potential for commercial activities from within park boundaries.

Wildlife Management Areas are tracts of Crown land set aside to provide wildlife habitat for the education and enjoyment of the people of Manitoba. WMAs may also be used for agriculture, forestry, recreation, gravel extraction and other resource uses, as well as habitat modification for "game" (Manitoba 1990). Until recently no permanent structures were allowed in WMAs; but in 1990, the provincial legislature changed the law to allow Ducks Unlimited Canada to construct their previously illegal main office building in a Wildlife Management Area. Therefore, the category of Wildlife Management Area no longer has any meaning in Manitoba.

Provincial Forests were established to reserve land for a perpetual growth of timber (Forest Act 1987). Many of these forests have since been overlain with Provincial Parks but continue to be Provincial Forests as well. Provincial Forests are of two types: forest reserves, used for both recreation and timber extraction; and forest management licence areas, which are used for timber extraction only. The owner of a licence has rights to the trees only, and must use sustained yield management (Manitoba Natural Resources 1990). At present, three forest management licences exist in Manitoba—held by Pine Falls Paper Co. (formerly Abitibi-Price Inc.) since 1979, Repap Manitoba since 1989, and Louisiana-Pacific, which has just been awarded a hotly-disputed licence in western Manitoba.

PROPOSED GUIDELINES FOR PROTECTION

Manitoba is one of the worst provinces in Canada for protection of parks from commercial exploitation. Some of the policies recently proposed by the Manitoba Round Table for Natural Lands and Special Places still favour economic interests above ecological ones.

The first objective of the Round Table plan is to "keep representative areas of Manitoba's natural regions in an undisturbed state to maintain biodiversity and sustain natural processes." The goal is to protect 12 percent of Manitoba, through legislation, from commercial activities such as logging, mining and hydroelectric development, with representative areas from each biologically distinct region. Yet the Provincial Government would "re-define the boundaries of these designated areas to exclude areas presently committed to commercial logging, mining or hydro development." If these areas are already protected, it is because they were previously found to be biologically important; such boundary shifting is, therefore, in direct conflict with the first objective of the plan.

One of the Round Table policies states the intent to "Honour legitimate land use, access and resource harvesting rights of individuals, businesses, organizations and aboriginals, by allowing those uses and rights to continue." These are the same rights that have allowed the current levels of commercial development to degrade the areas. In other words, all economic development which was supposedly banned under other sections will be allowed under this portion of the new policy. Another section advocates the sale, lease or rental of Crown land and resources in natural lands and special places. This is just the opposite of recommendations by the Manitoba Environmental Council and would clear the way for increased private ownership and increased commercial development.

In general, most of the policies of the Round Table advocate "sustainable development" within the boundaries of the natural lands and special places which are supposed to be kept in an undisturbed state to maintain biodiversity and sustain natural processes. If protection of natural areas is the main objective, then economic and commercial development, even if sustainable, must be banned completely from the areas designated as the 12 percent of Manitoba to be protected.

HUMAN INTERACTION WITH WOODLAND CARIBOU

Recreation

In Jasper National Park alpine tundra range, Woodland Caribou declined dramatically in the 1960-70s. The decline was correlated with a 1271 percent increase in human activity and harassment (Stelfox 1985). In contrast, a study of High Arctic Svalbard Caribou (*Rangifer tarandus platyrhynchus*) in late winter failed to discover how the short-term behavioural responses, such as trauma and energy expenditure, could affect the well-being of the animals (Tyler 1991).

Transportation Access and Human Hunting

Woodland Caribou movement may be affected by artificial barriers such as snow berms, railways and roads (Curatolo and Murphy 1986; Dau and Cameron 1986). Often Caribou will cross roads if these are found on traditional routes (Johnson 1985; Johnson and Todd 1977). Klein (1980) suggested that if there is an increase in predator activity or hunting along these routes the animals may avoid the crossings, disrupting traditional movement patterns and thereby effectively decreasing the range or fragmenting the herd into smaller components.

As Caribou become more accustomed to highway traffic, Caribou deaths increase as roadkills (Edmonds and Bloomfield 1984). Johnson (1985) believed that collisions remain a major threat to Caribou. Warning signs may be effective in reducing mortality from collisions with motor vehicles (Johnson 1985).

In Manitoba, Caribou are classed as a big game animal. Human hunting is a significant mortality factor for Caribou. Bergerud (1985) suggested that there can be no harvestable surplus of Caribou when natural predation pressures are present. In a study of Mountain Caribou, Johnson (1985) surmised that human-caused deaths (including hunting) may have equalled recruitment between 1972 and 1983. Between 1967 and 1983 illegal hunting of Mountain Caribou made up 75 percent of the observed mortality, with all hunter-caused mortality occurring in September through November. Road access increases the hunting opportunities (Benoit, in prep.; Jackman 1973). Indeed, Stevenson (1986) suggested that "the effects of access on caribou may be so severe that there is little value in modifying logging practices to maintain caribou unless road closure is included in the management plan." The closing of all hunting in some areas of Caribou range is believed to reduce the "threat of inadvertent poaching"—the shooting of Caribou mistaken as other game species (Johnson 1985).

Forestry

Some wildlife managers believe that the harvesting of trees is not initially detrimental to the Woodland Caribou (Johnson 1993). Some also believe that changes in the forest composition due to timber harvesting have allowed the expansion of Moose (*Alces alces*), deer, and Gray Wolf (*Canis lupus*) at the expense of Caribou (Wildlife Branch files in Johnson 1993). More certainly, with the change of habitat and increased access came influxes of both alien species and hunters (Bergerud 1985; Bloomfield 1980). The increased access to Caribou range decreases habitat by permitting logging and increasing chances of fire. Logging and fires reduce the uneven-aged climax stands of forest required to produce arboreal lichens that sustain Caribou through the winter (Cook 1972) to regenerating patches of even-aged stands. Edmonds and Bloomfield (1984) reported that, in Alberta, Woodland Caribou did not feed in clearcuts

larger than 2 hectares (1 ha is roughly 2.5 acres) and were known to cross a larger clearcut only once in 4 years. Bergerud (1985) claimed that the Woodland Caribou of the Slate Islands, Ontario, had high densities during logging in the 1930s; and today, in the absence of White-tailed Deer and Gray Wolves, thrive in disturbed second-growth forests following both logging and forest fire. Schaefer and Pruitt (1991) found, however, that "uneven-aged" or "stable-aged" ("old-growth") Jack Pine forests in southeastern Manitoba—although having smaller terrestrial lichen crops than younger, even-aged stands—had more favourable snow cover conditions which allowed these lichens to be available more readily.

Another forestry-related activity that may be detrimental to Woodland Caribou is the control of spruce budworm (*Choristoneura spp.*). It has been suggested that these infestations cause the slow denudation of branches which allows light penetration through the canopy to create favourable conditions for arboreal lichens (Ahti and Hepburn 1967).

Scarification (mechanical preparation of seed bed) and herbicide treatment used in "regeneration of forests" can hinder the establishment and growth of lichens (Eriksson 1975). Eriksson (1975) found that Reindeer were reluctant to cross treated areas. Other chemical treatments may be harmful, such as fertilizing with ammonium nitrate and urea, which affect the winter foraging of Reindeer (Eriksson 1980). Stevenson (1986) suggested that partial cutting allows retention of some arboreal lichens and that partial cutting and small patch harvesting may improve forage lichen growth on the remaining trees.

Mining

Mining itself usually has little direct impact on Caribou range, as long as the mine is not located on a mineral lick or in calving or rutting areas (Johnson 1993). Increased development and accessibility are the heaviest impacts of mining, because mines may require many employees, creating large urban centres. Lichens are very sensitive to airborne contaminants, so smelter emissions have a long-term effect on surrounding Caribou habitat (Klein 1971).

Hydroelectric Developments

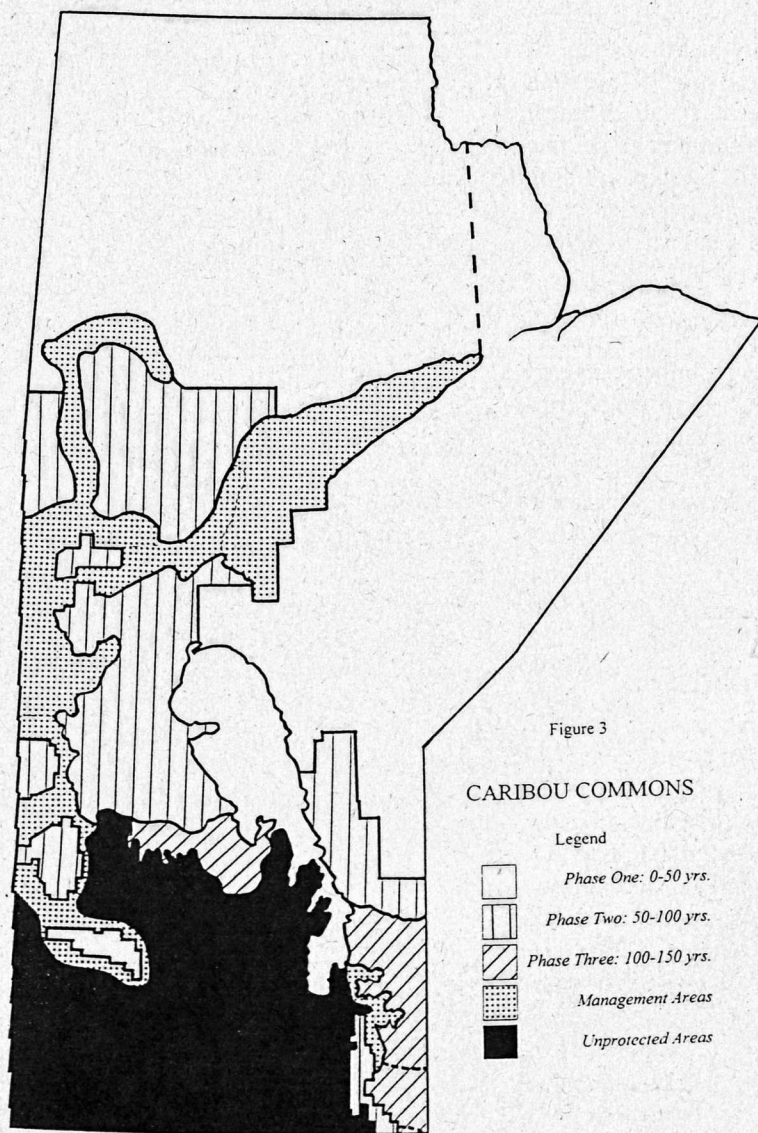
The direct effects of a hydro transmission line itself on Woodland Caribou may be minimal, but roads developed along the line are a threat by allowing increased access to caribou range (Johnson 1993; Crichton 1990). Reindeer herders in Scandinavian countries noticed that the sound produced by hydro lines seemed to disturb Reindeer (Klein 1971). Also, changes in light, moisture, snow and wind in the cleared areas may deter Reindeer from crossing these unfamiliar lines for one or two years after they are built (Klein 1971). Transmission lines and roads increase the chance of Caribou being spotted and taken by hunters or natural predators such as wolves (Johnson 1993).

Hydroelectric dams create severe problems for Caribou. The dams and resultant flooding reduce available habitat and deny the Caribou migration routes. In Scandinavia new waterways, lowered water levels downstream, and unsafe ice were found to disrupt migration routes of Reindeer. Death traps in the form of ice shelves and slanted shore ice are caused by variable water levels (Klein 1971). Dams also mean increased access and development in the area, thus adding to the threats Caribou herds may face (Johnson 1993).

THE CARIBOU COMMONS

Because of the vast regions of land in northern Manitoba still considered "pristine wilderness," our "Caribou Commons" scheme deviates markedly from the core-buffer-corridor approach of The Wildlands Project (Foreman et al. 1992). Within Manitoba our proposed "core reserve" encompasses the entire northern portion of the province and extends southward along gradients to where human intervention becomes insurmountable.

Our proposal is for establishment of the Caribou Commons in three stages, over the course of 150 years. Each successive phase will involve the incorporation of additional land into the Caribou Commons.



Phase One

The initial phase of the Caribou Commons project (Figure 3) should begin immediately and be completed within 50 years. The establishment of the initial protected areas will include setting the following criteria for usage:

- 1) Treaty rights of aboriginal peoples with respect to hunting, trapping, and access to the land will continue.
- 2) Registered traplines will remain in operation at the discretion of the individual trappers.
- 3) Winter roads will remain in operation but with access limited to aboriginal communities.
- 4) Campgrounds will be closed.
- 5) No new outfitters' licences will be granted and existing licences will not be transferable.

- 6) Hydroelectric transmission lines and facilities will remain in operation but with decreased contact between employees and Caribou.
- 7) Restricted scientific studies may be undertaken.
- 8) Areas will be cooperatively managed with aboriginal peoples.
- 9) Sports hunting will be permitted through licenced outfitters only.
- 10) No new mineral development will be permitted.

Phase Two

The second phase of the Caribou Commons should take place between 50 and 100 years from the onset of the project (Figure 3). In addition to the usage criteria established in the initial phase, the following criteria will be enacted:

- 1) Forestry activities will be disallowed in all reserve areas, including Provincial Parks and Forests.
- 2) Major roads will be open to restricted access only.
- 3) Minor roads will be closed.
- 4) Limited-use private lands will be bought for incorporation into protected areas.
- 5) Commercial fishers on lakes Manitoba, Winnipegosis, and Winnipeg will be allowed to continue.

Phase Three

The final phase of the Caribou Commons project would begin 100 years after the onset and be completed 150 years after the onset of Phase One (Figure 3). Along with the previously-described criteria, Phase Three will involve the following measures:

- 1) Cottage areas will be regained by the Crown through attrition. Existing cottages may not be sold, but may be passed on to direct descendants.
- 2) Crown land leases within protected areas will not be renewed.

Management Areas

Caribou currently inhabit some of the areas to be retained for human and economic development. To preserve these herds it will be necessary to establish, beginning in Phase One, the following management guidelines:

- 1) No hunting will be permitted other than that provided for by aboriginal treaty rights.
- 2) Buffer zones or agricultural, forestry, mining "interfaces" will be designated where appropriate.
- 3) Caribou herds will be monitored intensively, but not intrusively.
- 4) Low-impact human and economic development will be allowed in selected areas only.
- 5) Strict anti-poaching measures will be enforced.
- 6) Herds in critical danger may be relocated or augmented.

GUIDELINES FOR THE CREATION OF THE CARIBOU COMMONS

Phase One

The regions to be protected by Phase One of the Caribou Commons were chosen after detailed analysis of human use within the current and historical range of Caribou in Manitoba (Figure 1). The southern limit of the Phase One Caribou Commons is delineated by the northern boundary of forest licences held by Pine Falls Paper and Repap Manitoba Inc. Because of current agreements, it was felt that these licences must be respected. The region known as the "mineral belt" was also excluded from the Caribou Commons because of its economic importance and the existence of large human populations and operating mines.

We mapped a transportation and hydroelectric "buffer zone" extending from the mineral belt to the northeastern portion of the province. We recommend this zone because it is the main access to the north for vehicles and hydroelectric transmission lines.

Phase Two

Phase Two of the project increases the area of the Caribou Commons southward. The areas previously excluded because of forest licences are now incorporated.

In southeastern Manitoba the boundary of the area is to avoid the high concentration of private cottages in the Provincial Park system (Figure 2). The Interlake Region is also incorporated into the Caribou Commons as far south as the existence of large, contiguous areas of Crown land. Because of high human population and resource development in west-central Manitoba, this area was left as a zone of human occupation.

Phase Three

In the final phase of the project the protected land encompasses the full historical range of Caribou in the Province of Manitoba (Figure 1). The area excluded is that of intense human usage (transportation, hydroelectric transmission lines, mining, private land and agriculture). Although the vast bulk of the land required for the full development of the Caribou Commons is already owned by the Crown, a minimum of private land is required.

SUMMARY

The Caribou Commons is designed as an effort to protect the habitat of Caribou in the Province of Manitoba so that their long-term survival can be assured. Because of the negative effect humans have on Caribou, a reduction in contact is required to preserve them in Manitoba. This project has endeavoured to limit the interactions between humans and Caribou wherever possible. Although we may not be able to eliminate human intervention into Caribou habitat, this project enables us to reduce it dramatically. Also, by basing an ecological reserve on a wide-ranging ungulate, numerous other species of plants and animals will benefit from the decrease in human development of their natural habitats.

A balance must be achieved in order to satisfy the needs of the Caribou and the needs of the human population. For this reason, the establishment of the full Caribou Commons outlined in this report cannot be accomplished in a short time period. By breaking it into three phases over a period of 150 years, the Commons can be realized. This time frame will enable human populations to establish alternative economic enterprises that do not rely on the land needed for the continued survival of the Caribou and other species. It is hoped that the creation of the Caribou Commons will allow future generations of humans to continue to enjoy the natural communities of plants and animals in Manitoba. ■

W.O. Pruitt is Professor of Zoology at the University of Manitoba. His research interests are adaptations of mammals to northern environments, particularly to winter and snow. In 1973 he started, and still operates, Taiga Biological Station in the Shield country northeast of Winnipeg.

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North, South, East and West

Toward an Inter-Hemisphere Conservation Corridor

by Jim Thorsell

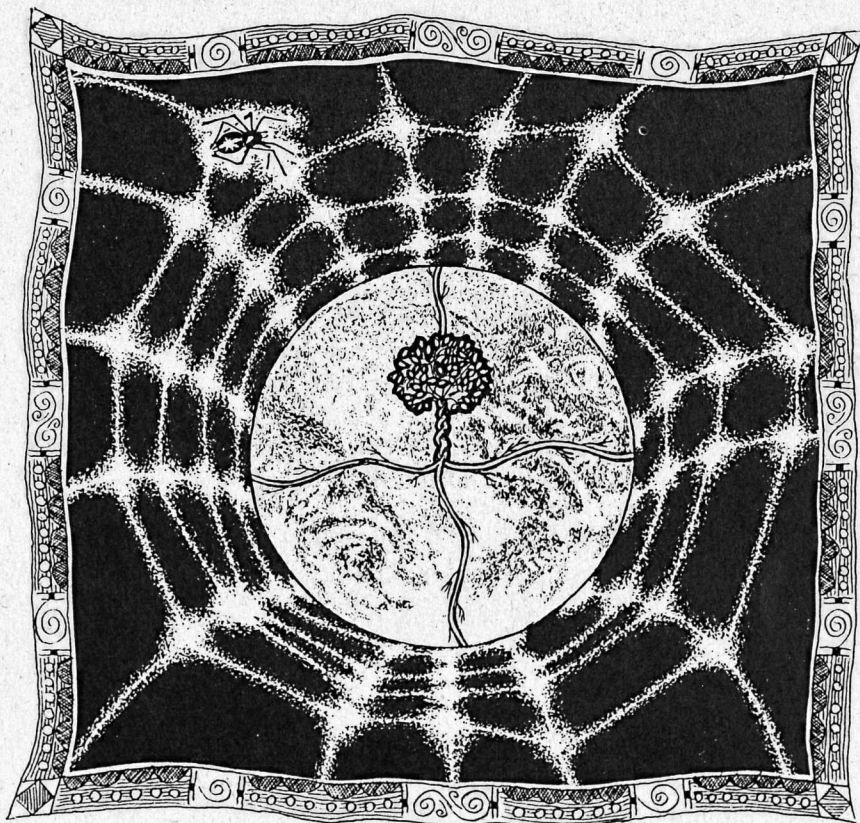
Achieving conservation in Central America has been no easy task. Poverty, civil disturbances, population growth, land tenure issues, and often the lack of political will have been obstacles to the establishment of a functional network of nature reserves throughout this biologically diverse region.

Nevertheless, a rudimentary park system does exist and an ambitious regional project to link protected areas in a continuous corridor has been underway since 1990. Named *Paseo Pantera*—or Path of the Panther—the project has succeeded in mapping the existing and proposed reserves and identifying missing links. A data bank has now been developed using GIS techniques. Peace dividends, conservation benefits, cultural heritage interests and indigenous rights are blended in the Path of the Panther and all agendas are combining to promote the concept.

While the Path of the Panther corridor is 1000 kilometers in length and is limited to this small region, the potential for linking it with protection efforts elsewhere to form a 40,000 kilometer trans-hemisphere green corridor presents an exciting prospect. Such a green belt could extend from the European continent through Asia to the Far East and across the Bering Strait. It would continue south through North America, hook up with the Path of the Panther and connect with another proposal linking the protected areas of the Andes down to the farthest reaches of the southern hemisphere.

A bold but feasible concept. Here is an outline of the possibilities:

- South America—A concept for a continuous chain of protected areas extending through the Andes from Tierra del Fuego to Colombia was developed by various IUCN members at a recent meeting in Ecuador. An IUCN General Assembly Resolution on this was passed at the General Assembly in Argentina in January 1994.
- Central America's *Paseo Pantera* is well advanced in its planning and is being implemented now by the various governments involved, with support from the Wildlife Conservation Society.



- Mexico—Currently a missing link in the North American chain but with the stimulus of NAFTA and the growing conservation awareness in the country, the potential certainly exists.
- USA—A Great Divide Trail and a Pacific Crest Trail now link up two separate networks of protected areas from the Mexican to the Canadian borders. The proposed Northern Rockies Ecosystem Protection Act and The Wildlands Project would reinforce the linkage in the American section.*
- Canada—A series of protected areas along the spine of the Rocky Mountains is also unified through the concept of a Great Divide Trail which runs up to northern British Columbia. There is but a short gap before the extensive St. Elias World Heritage park system, consisting of five major contiguous national and provincial parks, takes the corridor on into Alaska.

Perhaps it is ambitious enough to stop here with a "Corridor of the Americas" but a further extension to Asia and Europe could also be envisioned:

- Beringia—The concept of a Beringia international heritage corridor has been agreed to in principle by the presidents of the US and Russia, and detailed studies have been conducted.
- Siberia/Mongolia/Northern China—Another missing link in the chain but, once again, the potentials are there, needing to be studied.
- China/Central Asia—Here UNESCO has been promoting the restoration of the Silk Route, the old Marco Polo trail from Beijing to Venice.
- Europe—North from Venice becomes problematic, but corridors could be indentified through the Alps to Geneva or alternatively up through the border parks system of eastern Europe and on to the Baltics and even into Lapland.

Of course legs and branches on all these options can be plotted and other variations exist. Yet the essential concept of a global green corridor linking a series of nature reserves, cultural sites, and other heritage resources is clearly feasible and already partly in place. The challenge now is to find a suitable forum where this can be discussed by representatives of the existing corridor projects, and then to gain endorsements from the respective governments. A daunting process indeed, but that is what was originally thought about the Path of the Panther! ■

Jim Thorsell has field experience in over 400 national parks in 80 countries. He is Senior Advisor for Natural Heritage for the International Union for Conservation of Nature (Rue Mauverney 28, CH-1196 Gland, Switzerland). He coordinates IUCN's work for UNESCO's World Heritage Convention and serves as the headquarters contact for the IUCN Mountain Protected Areas task force.

* Editor's note: The Wildlands Project, Canadian Parks and Wilderness Society, and allied groups are well on their way to designing a Yellowstone to Yukon (Y2Y) corridor. See Harvey Locke's article in WE winter 1993/94 as well as recent TWP updates. —JD



Body of Owl

*Early summer. Mice mow the grass with
their bodies as they run. A light wind.
A river and a grove of pine trees.
Soft light and cool air. The sun pulls*

*its 80-degree day into the night
as if pulled through a needle.
The screech owl is as still as a stick.*

*Above the mice, the blond spruce pine cones
hold on to their secrets for as long
as they can. The owl is all eyes.*

*The mouse doesn't even whimper
as the owl strikes. And the owl
doesn't cry as I climb,
climb
into the body of owl.*

—Linda Young

Book Reviews

A PLACE IN SPACE: ETHICS, AESTHETICS, AND WATERSHEDS

by Gary Snyder; Counterpoint (1627 I St. NW, Suite 850,
Washington, DC 20006); 1995; \$25; 263 pp.

Gary Snyder needs no introduction to *Wild Earth's* readers, and the majority of the twenty-nine essays contained in *A Place in Space* are reprints, at least one having been published in this journal. Should you consider adding the book to a shelf already groaning under a heavy load? Without a doubt, yes.

One simple reason is that few manage to keep abreast of Gary's work: he is an imaginative and prolific writer whose works appear in unexpected places. Thirteen of the essays have been written since the 1990 publication of *The Practice of the Wild*, and all of them express deep insight into wild nature in a remarkably spare, direct style. Snyder's voice is arguably the clearest and most commanding in a crowded theater of nature writers, environmental scientists, conservation biologists, and others who engage themselves with the issues of habitat, species, and sustainable living. The collection spans nearly forty years, a virtue in that no reader can miss the constant center and inexhaustible depth of Snyder's work.

More than anything, *A Place in Space* gives me hope that the task of creating bioregional cultures that allow room for biodiversity, ecological integrity, and human flourishing is not so conceptually complicated as to lie beyond the realm of possibility. Snyder believes that the first step begins with the simple realization that we are of and about the earth: every human lives within and is a part of a place in space. Each of the three sections—headed "Ethics," "Aesthetics," and "Watersheds"—fleshes out this elemental principle, drawing on Snyder's rich experiences and later reflections.

"Ethics" avoids philosophical jargon, offering instead such pieces as a

retrospective on the Beat generation and the now classic "Smokey the Bear Sutra." What did the Beats have that we need? The power of the unfettered imagination to transform life, something that is "more basic and more revolutionary than any political program based on 'civilized abstractions.'" Snyder also explores such issues as "sacramental ecosystems" and the relevance of ecological science to the basic questions of humanity, namely "who we are, how we exist and where we belong."

The essays in "Aesthetics" are an inspiration for those who would regain a placed-sensibility of the interrelations of organic and cultural forms. Or those who would seek words that still have earth clinging to their roots, otherwise called "bioregional narratives."

The essays in "Watersheds" are a fitting conclusion. St. Henry observes in *Walden* that only one in a million exemplifies the principles for which she or he speaks. *Wild Earth* has no typical reader; likely we are all committed to overcoming the human-centered philosophies that motivate the destruction of the wild. Yet call our philosophy what we will, be this reinhabitation, restoration, conservation, or preservation, few of us acknowledge let alone close the gap between principles and practice. Those who do live out their philosophy are exemplars, to whom we should give single-minded attention. Snyder is one who does. *A Place in Space* offers us an opportunity for a sustained meditation on the practice of the wild. ●

—Reviewed by Max Oelschlaeger
(Center for Environmental Philosophy,
University of North Texas, Denton,
Texas, 76203), author of *The Idea of Wilderness*.

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Landscape and Memory

Why We Garden

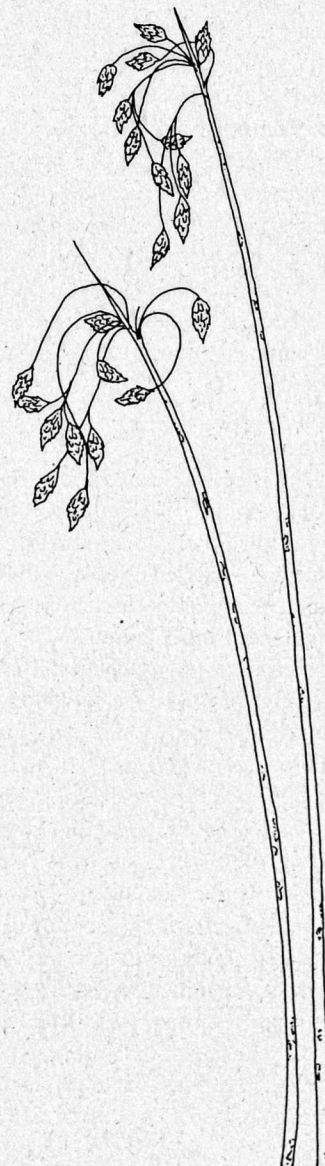


illustration by Libby Davidson

THE PRAIRIE KEEPERS: SECRETS OF THE GRASSLANDS

by Marcy Houle, Addison-Wesley Press (1 Jacob Way, Reading, MA 01867); 1995; \$20 (hardcover); 224p.

Author Marcy Houle was a graduate student at Oregon State University when she was assigned to a Fish and Wildlife Service study of hawks on the Zumwalt Prairie, a 200 square mile area in northeast Oregon. Bounded by the Hells Canyon complex to the north and east, and the Wallowa Mountains to the south and west, the Zumwalt is said to harbor one of the highest concentrations of buteos on the continent. The grassland is privately owned by ranchers who have grazed and farmed the area for a century. Houle's task was to assess hawk numbers, species, distribution, reproductive success, diet, and most important, why the Zumwalt has so much hawk activity. Her research was ultimately aimed at providing answers to the question of how to manage grassland ecosystems for biodiversity.

As Houle notes at the beginning of her book, native grasslands are greatly jeopardized throughout North America. She doesn't list the reasons why, however, either at the outset or anywhere else in her story—which is just as well for her purposes because if she had, her book's premise would be suspect. Though agriculture—farming and ranching—has led directly to the devastation of native species across the Great Plains and mountainous West, Houle contends that private ownership and livestock grazing are the salvation of the Zumwalt, and by extension, grassland ecosystems in general.

As a story, *The Prairie Keepers* is engaging—both lyrical and humorous. Houle, the fresh-faced, naive, Julie Andrews-like character, walks into a rural community peppered with oddballs, both benevolent and hostile, and a social milieu that resists newcomers and new ways. Nevertheless, she finds allies, including a Forest Service biologist, a Soil Conservation Service employee, and some local ranchers who

take an interest in her work. There are amusing escapades with stuck trucks, a testosterone-crazed bull, and cocky male bureaucrats looking to show off their cleverness to Houle (who finds most of them boorish and selfish instead). Her descriptions of the birds themselves are the best parts of the book. Elegant and inspiring, the hawks reveal to Houle not only their food habits and habitat choices, but also the private dramas of their wild lives, which include show-downs with nest predators and anguish over the death of fledglings.

Unfortunately, Houle does not confine her musings to birds and hinterland eccentrics, but attempts to argue for the preservation of a particular, rural way of life, using limited science (her own research) and a predictable litany of pro-livestock rationalizations. She seems to have drawn her own character as a rather naive, idealistic young woman who wanted to fit in and be liked, for her desire to believe in the goodness of the ranchers and their appealing lifestyle overwhelms her skepticism about the effects that lifestyle has on the land.

Houle contends that livestock grazing benefits wildlife because cows are "primary grazers." They take rough, low-quality forage avoided by other herbivores, such as deer, antelope, geese, ground squirrels and pocket gophers; and they simultaneously promote regrowth of the young, succulent shoots that the "secondary grazers" prefer. If the "wolfy" plants became prevalent, Houle claims, "...there would be no available food for many species of wildlife, the 'overmature plants' not being acceptable food...in historic times, in places where there were no bison, like the Zumwalt and much of Oregon, early settlers almost starved because there were so few deer and antelope and other animals..."

What are the problems with this line of reasoning? First, the species Houle

names as beneficiaries of livestock grazing are relatively common, if not downright "weedy." Many tolerate, or even thrive in, disturbed areas, so long as they are not killed outright and the ground is not so pulverized as to offer virtually no food or shelter.

Second, it is true that some animals will not eat "wolfy" plants, but many others simply *prefer* not to eat the dry vegetation, any more than we would prefer to eat shredded wheat if we could get fresh cinnamon rolls. Also, the plant condition that Houle derides as "overmature"—a term foresters also use, for ancient forests—provides other services to grassland systems, including structural diversity, nesting and hiding cover for birds and small mammals, and probably hydrological benefits, by catching wind-blown snow that would otherwise be swept away and by holding moisture in the tangle of dead and slowly rotting vegetation at ground level.

In the Zumwalt region, the predominant native grass species are bunchgrasses, like Bluebunch Wheatgrass and Idaho Fescue, which tolerate light grazing. The deferred rotation grazing scheme that Houle says most ranchers use on the Zumwalt probably would not drive out the native bunchgrasses if carried out conservatively. However, just as foresters have defended their logging practices because "there's still Douglas-fir and ponderosa pine out there" but do not acknowledge that they've eliminated all the age and structural diversity of the forest, so too do Houle and other livestock advocates ignore the qualitative changes that cows impose on individual plants and plant communities.

The third error in this argument over the necessity of primary grazers is that the ecosystem has already provided itself with them. As Houle herself states, Bison and Elk willingly, even contentedly, eat the "shredded wheat" that other

animals spurn. If wildlife managers are truly concerned about biodiversity, they will promote *native* primary grazers, not exotic ones. As Houle and any other biologist should know, the primary grazer niche is only so big, and as you fill it with cows, you leave less room for native species. In addition, the energy that goes into the Bison or Elk eating Bluebunch Wheatgrass stays within the ecosystem, instead of being transported out, as happens to cattle. After a native herbivore dies, that energy is transferred to predators, scavengers, and decomposers such as fungi and bacteria.

The Hell's Canyon area adjoining the Zumwalt is presently home to some of the largest Elk herds in the country (roughly 14,000 in Wallowa County alone). But, as quoted above, few native ungulates were found in northeast Oregon at the time of white settlement. While it's not clear whether Houle believes large native grazers were historically rare because the land had not yet been endowed with cows, or thinks deer, Elk and Pronghorn simply never got here in large numbers, she clearly implies that the reason for the current abundance of Elk is the ranchers' wise management. Houle does not consider two other possibilities, one more theoretical, with respect to the historic situation, and another observable today, regarding the prosperous Wapiti.

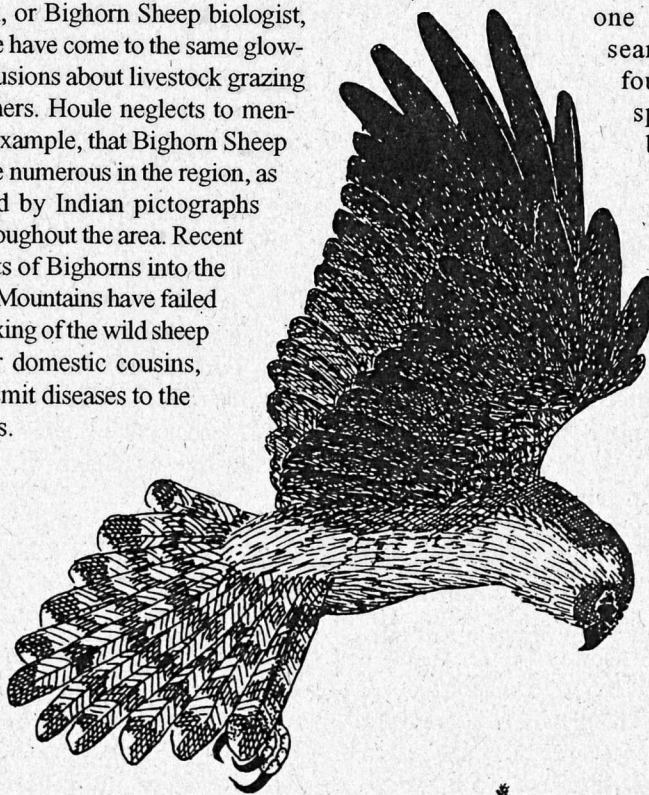
Some researchers theorize that native American hunters were responsible for suppressing herbivore populations in various regions of the West, including the Intermountain grasslands. The advent of horses, especially, made Indians highly efficient predators. Whether this was the cause of the depauperate fauna of eastern Oregon is speculation, but it is at least as plausible as the idea that North American mammals had to wait around until European settlers introduced cows before they could really thrive in their native habitat. With regard

to Oregon's present wealth of Elk, the primary reason appears not to be rancher benevolence—for in fact, most of the Elk live on public lands, much of it ungrazed by cows—but a continuous, relatively intact, and diverse range of habitat, from dry canyon bottom to cool, timbered mountaintop. Unlike most regions of the West, where Elk winter range is either grazed by or hayed for cows, and summer range is also grazed by cows, Elk have a great deal of the public lands of the Hell's Canyon ecosystem all to themselves.

One wonders, if Houle had been a wolf, fish, or Bighorn Sheep biologist, would she have come to the same glowing conclusions about livestock grazing and ranchers. Houle neglects to mention, for example, that Bighorn Sheep were once numerous in the region, as evidenced by Indian pictographs found throughout the area. Recent transplants of Bighorns into the Wallowa Mountains have failed due to mixing of the wild sheep with their domestic cousins, who transmit diseases to the wild herds.

Since Houle was out of her area of expertise when talking about grazing mammals and range conditions, her tired arguments in that arena can be dismissed more readily than her findings with regard to the *buteos*. It does indeed appear that hawks and other raptors thrive on the Zumwalt, in greater numbers and diversity than almost anywhere else on the continent. Since many people typically associate these birds of prey with wild landscapes, the wealth of raptors in an area managed for an exotic animal is puzzling.

Moreover at least one other researcher has found some species of *buteo* to favor large



* Houle cites J.T. Lokemoen's work in Colorado. In contrast, C.D. Littlefield, S.P. Thompson and R.S. Johnstone (1992) found on the Malheur National Wildlife Refuge in Oregon that wintering Rough-legged Hawks, a species not studied by Houle, preferentially used "idle" land—land not currently grazed or mowed, where the hawks' major prey species, montane voles, were more plentiful. In addition, their paper cites another by Lokemoen (Duebber and Lokemoen 1977) that reports nests of American Bitterns, Northern Harriers, and Short-eared Owls in an undisturbed grassland, but none in annually grazed areas, over the course of a 12 year study.

The danger of a treatise like The Prairie Keepers is that it turns "what could work here" (cows and hawks can coexist in this particular place) into "this has to work everywhere" (cows are necessary for ecosystem integrity).

holdings of private ranchland over adjacent, "idle" but otherwise similar habitat." What could be the connection, if any, between ranching and raptors?

Some explanations that come to mind are, first, as Houle states, nesting raptors are not very tolerant of high levels of human activity. Since most Western ranches are large spreads with few people on them, the hawks are probably left alone for the most part (notwithstanding the occasional trigger-happy cowboy). In addition, the species that Houle studied (Red-tailed, Swainson's, and Ferruginous Hawks) subsisted primarily on Northern Pocket Gophers and Belding's Ground Squirrels, rodents that tolerate, even prefer in the case of the ground squirrels, areas with short vegetation. Because these particular rodents appear to do fine on rangelands in moderately good condition, the hawks should do well, too, so long as they aren't being shot or poisoned.

The reason why the Zumwalt is especially attractive for buteos, more so than other places in which the range is in relatively good shape, may be the unique configuration of mountains, canyons, and prairie in northeast Oregon. A more ecologically diverse region would be difficult to find in North America. The enormous vertical relief, in a relatively small area, allows a greater variety of species and larger populations to exist than would be found in a more typical Western landscape. Each species can meet its precise habitat requirements—in essence, more niches are available. This was true before the cows, and if cows vanish from the Zumwalt, it will continue to hold, and in fact diversity may increase, so long as the land is protected from major development.

Which leads to Houle's greatest fear, that this special little part of the West will be "discovered" and destroyed by condos, ORVs, and groups like the Hell's Canyon Preservation Council, which is proposing a 1.5 million acre Hell's Canyon National Park. The author seems particularly confused in her dis-

cussion of public land management and agencies, as well as the impacts of human hikers versus munching cattle, and the causes of "boomtowns" and home development. She talks about how ORVs run rampant in National Parks: they do, in a few places, like snowmobiles on the roads of Yellowstone; but for the most part, it is other public lands, not National Parks, that encourage the ATVs, dirt bikes, and jet boats. She decries the "aggressive" tourists trampling parks to death. Apparently she is unaware that the threats to ecosystems within National Parks come primarily from activities—such as livestock grazing, logging, stream dewatering, dams, and air pollution—that occur outside park boundaries. And despite these problems, the natural environments of most parks remain more complete, more fully functioning, than the lands outside.

Ironically, Houle laments the fact that the American populace is increasingly out of touch with the land, yet rejects the notion of public land. Are we to just read about the beneficent ranchers who live in harmony with the earth, and be satisfied with that? Maybe we can look at the private land as we lean over a barbed wire fence?

No doubt the small towns at the base of the Wallowa Mountains, perched at the edge of the Zumwalt, are being transformed. I saw this for myself on a recent visit. Scenery, not herefords, is becoming the most valuable commodity in the region. Interestingly, the relatively strict land use laws of Oregon (part of the bureaucracy that Houle denigrates) act to slow the development of this area. While believing that the ranchers she admires so much would only give up the land and their way of life if "evicted" by "untenable laws and sky-high fees," she turns a blind eye to all the other forces that drive people away from family farming, including irresistible profits from selling and developing, competition with agri-business, and disillusionment (usually of the younger generation) with the hard, often dull

business of running cattle, moving irrigation pipe, and driving two hours to get to town for shopping or a movie.

Certainly, more peacemakers like Marcy Houle are needed, who look for the good in those individuals and groups that others say should be enemies. As she admits in her book, Houle turned out to be a better PR person than a biologist, and she did get a number of ranchers to take an interest in raptors. She also got them to realize that the BLM, Fish & Game, and other agency folk were real people, and vice versa. The danger of a treatise like *The Prairie Keepers* is that it turns "what could work here" (cows and hawks can coexist in this particular place) into "this has to work everywhere" (cows are necessary for ecosystem integrity). The author is overeager to make sweeping statements when the science, even for her study area, is limited and the conclusions are based on some faulty assumptions of cause and effect.

Finally, she makes the common error of confusing what is significant socially with what is important biologically. Houle may long for the days when travelers never packed lunch, as an old-timer tells her, because when they got hungry they just stopped at the nearest farmhouse, whether somebody was home or not. But the wolves and the Bighorns didn't get any "free lunch" from the ranching way of life, and neither does the public. The Zumwalt Prairie might, in many ways, be a nice exception to the rule; but when it's just 128,000 acres out of the hundreds of millions of acres in the West grazed by cows and sheep—land where species like Lahontan Cutthroat Trout, Black-footed Ferret, Columbia Sharp-tailed Grouse, Bison, Masked Bobwhite, prairie dogs and many others have been either excluded or are threatened due to livestock—that's small comfort. ●

—Reviewed by Mollie Matteson
(POB 3975, Eugene, OR 97403), wildlife biologist and free-lance writer

GRASSLAND: THE HISTORY, BIOLOGY, POLITICS, AND PROMISE OF THE AMERICAN PRAIRIE

by Richard Manning; Viking Press (375 Hudson St., New York, NY 10014-3657); 1995; \$23.95; 306p.

Richard Manning's new book, *Grassland*, is a well-written and thorough overview of what is probably our most abused ecosystem—the sweeping grasslands that run east from the slope of the Rockies to trees in the Midwest that signal the end of the prairie. Manning's book takes us on a far-reaching journey through the politics, history, and ecology of this broad landscape.

While little of the information Manning has collected is new, he has done a superb job of reporting. He goes beyond mere recounting of facts or quotes; he does what all good reporters should do but few achieve—he provides perspective and insight as well as facts. Manning has also accomplished something that is perhaps more difficult than shedding light upon some obscure piece of original research—he has managed to capture numerous ideas in one lucid synthesis. The incredible amount of information in the book's 300 pages ranges all over the map, from the politics of range wars to the literature of the plains.

Manning is obviously enchanted with the landscape; yet for the most part, he avoids being captured by the agrarian myth and cowboy fantasy. Although he occasionally misses the opportunity to point out obvious paradoxes, such as a wheat farmer in Montana who has plowed up thousands of acres of native grasslands to grow an exotic grass then complains about a proposed gold mine that will “tear up the country,” he nevertheless makes a convincing case that the attempt to domesticate the grasslands has produced a landscape of failed dreams and paradigms precisely because they were settled and brought under the plow.

Manning also discusses some of the landscape restoration ideas that offer a positive future in the region, such as the Big Open and Buffalo Commons. I would have liked a bit more attention to these ideas—in my view, not only are the plains our most abused ecosystem, they also offer our greatest hope for major ecosystem restoration.

For most of the book I kept saying to myself, Manning's got it right. He presented all the reasons why this landscape should never have been settled; and indirectly at least, he presented many reasons why we should think of it as a potential wildlands restoration site.

Still, in the end, one senses that while Manning intellectually appreciates the fallacy of Great Plains settlement and agriculture, he can't quite accept its failure as inevitable or desirable. At a gut level, he feels somewhat ambivalent, I suspect, about the statistics and facts he relates. He seems to conclude that there was something noble in the cause of Great Plains settlement, however misguided it might have been. I may be reading more into it than Manning really suggests, but I get the feeling that for the author what began as a fairly clear task of documenting the history and abuse of the grasslands as both a place and a metaphor, left him feeling less certain about his original thesis.

After taking us on a journey across miles, ideas, and paradigms, he doesn't quite know how to end the book. For example, he gets sidetracked attacking animal rights activists over hunting and other issues that are only tangentially related to the topic at hand, and certainly shouldn't be discussed in the closing chapters.

This is an expansive book, one that admirably matches the vastness and sweep of the landscape discussed.

Musing over what we should do with the plains, he asks should we graze them with cattle, or is there hope for a new kind of agriculture based on native plants? He doesn't really answer these questions, and in light of all he has said earlier, he should be very suspect of these ideas. I think, despite the critique he has offered, he still wants to see the plains and its people succeed as a human enterprise. It's like he has produced a smoking gun, a dead body, and a suspect, but doesn't want to press charges.

The plains are still an unresolved problem, for Manning and for the nation. Maybe that is as it should be, for one of the major intellectual problems of the historic past is the assumption that the plains could be categorized and explained easily in one or two good ideas or models as with Frederick Jackson Turner's “frontier” paradigm or the myth that water follows the plow. Maybe Manning's final tentative conclusions are better reflections of reality, and neat tidy endings are illusions.

Anyway, these are minor criticisms. Considering the breadth of the topic Manning chose to cover, he has done a superb job. This is an expansive book, one that admirably matches the vastness and sweep of the landscape discussed. ●

—Reviewed by George Wuerthner
(Box 3975, Eugene, OR 97403), wilderness explorer, author, and TWP board member

Pandora's Remaining Gift

HOPE, HUMAN AND WILD: TRUE STORIES OF LIVING LIGHTLY ON THE EARTH

by Bill McKibben; Little, Brown & Company (34 Beacon St., Boston, MA 02108-1493); 1995, \$23, 227p.

Devoted as it is to a meliorative vision, Bill McKibben's new book does not seem likely to elicit anything like the international acclaim given his gloomy study of global warming in *The End of Nature* six years ago. I suspect that he'll not be surprised; the first sentence acknowledges that "for those concerned about the environment, this is a strange season of waiting, a hard time for hope." Indeed it is. Simple greed, willful self-delusion, and the absence of campaign finance reform are driving an all-out assault on the environment and the regulations that protect it. A particularly egregious example is the industry-backed legislation to end US compliance with the Montreal Protocol and its amendments. One of the bill's two sponsors, Republican majority whip Tom DeLay, asserted that the scientific basis for the link between chlorofluorocarbons and the destruction of the ozone layer—for which three scientists earned the Nobel prize in Chemistry last year—is "debatable." The bill's co-sponsor, Representative John Doolittle, was given to understand the extensive peer review process to which the laureates' research was subjected. His response: "I'm not going to get involved in peer-review mumbo-jumbo." When those who establish public policy can so cavalierly dismiss our primary tool for understanding all natural systems, a paean to hope like Mr. McKibben's new book can seem inadequate, even perversely naive.

Sadly, neither the import nor the real value of *Hope, Human and Wild* is apt to become widely apparent unless (or until) large-scale environmental crises and the foundering of growth-dependent economies impinge upon personal, middle-class comforts in industrialized nations, forcing most of us to confront a materially diminished life. Then "true stories of living lightly on the earth" will seem eerily prescient, and we will hun-

ger for actual visions of how to "produce decent human lives with less money, less energy, less wood. Less stuff."

In widening circles of significance, like a stone dropped into a pond, Bill McKibben's stories move outward from his own rural home in upstate New York's Adirondack mountains to the Brazilian city of Curitiba, to the populous state of Kerala in southwestern India, bringing home in the end a recognition that there are "ways to live that both satisfy human desires and pay attention to the limits placed on us by the planet." The result is a paradoxically hopeful "primer for retreat" from the "untenable heights" of economic expansion and consumption which industrial societies temporarily occupy. The effect is to revivify two familiar dicta: small is beautiful; and think globally, but act locally.

Against the backdrop of accelerating global deforestation, Mr. McKibben first invites us to view the regenerating forests of the Northeast as "an expanding frontier of recovery that, given infinite human care and nurturing, might follow the waves of destruction across the continent and then around the world." He offers us examples of community supported agriculture, value-added local industry, and non-exploitative tourism as ways to bolster regional self-reliance and sustainability against the tyranny of a global consumer economy.

One could argue that this "explosion of green" in the most crowded corner of the nation is anomalous, a consequence more of benign neglect than deliberate restoration. Or one could even observe that this ecological renaissance was made possible—and is rendered insignificant—by the westering movement of agribusiness and timber industries to richer plunder. But this is to miss the point and the method of the book.

In Curitiba, Brazil, Mr. McKibben discovers a city made attractive, humane,

and richly diverse by progressive planning, civic pride, and municipal risk-taking under the leadership of a visionary mayor. Rather than a sterile "money-making machine," a downtown shopping district is designed as "a place for living—the exact and exciting opposite of a mall," prompting the consideration of whether by changing the conditions under which people live, we cannot evoke the capacity in human character to respond to "nonmaterial pleasures." To be sure, the picture of Curitiba and its citizens is anecdotal, impressionistic, but it is not blinkered: Mr. McKibben sees the trash in the river, and the greed and corruption that turn a community recycling program into involuntary servitude.

At this point, however, the reader who recalls Mr. McKibben's promise to deliver "strategies for retooling our societies and economies" may wonder when an assemblage of vignettes and pithy observations will give way to inductive synthesis in a plan of action. Yet this is precisely the point at which the reader should relinquish expectations of sustained, syncretic analysis, and submit to the book's rich, fugal design of contrapuntal themes.

In Kerala we are presented with a state that within a century has transformed itself from a caste-ridden, misogynous, colonial society to levels of literacy, health care, family planning, and social equity exceeding those in most Western countries. This is accomplished on an annual per capita GNP of \$330, less than one-fiftieth of the US standard. The cumulative effect of many examples is to make concrete and vivid the findings of the United Nations Development Programme's 1994 Human Development Report: essential qualities of human life are not dependent upon large-scale economic growth or individual accumulation of wealth. We need not resign our-

selves to the terminal environmental degradation that is the inevitable corollary of such unrestrained growth. To push the reader beyond the specious morality play in which the evils of monolithic socialism are subdued by the virtues of corporate capitalism, Mr. McKibben limns a society morally transfigured by (leftist) ideals of voter education and (Marxist) ideals of redistributed wealth. Rather than touting a political model or ideologic alternatives to democracy, however, he considers the actual results of these applied ideals as simple object lessons in civic "commitment to fairness," or as efficacious demonstrations of intersecting self- and public interest, from which we have "much to learn."

Observing that Keralan social ideals are sustained in the face of chronic unemployment, by the workers who must bring home their pay from oilfields in the Persian Gulf, Mr. McKibben quotes a development expert's comment that Kerala is "a bloated social welfare state without the economy to support it." To raise such doubts about sustainability, without providing viable solutions, has led captious readers to criticize his vision as unsophisticated.

Again, though, Mr. McKibben's larger purpose does not embrace overarching economic analyses; for those one must turn, for example, to Jeremy Brecher's and Tim Costello's thoughtful prescriptions in *Global Village or Global Pillage* for "economic reconstruction from the bottom up." Nor should the tough hope in this book be confused with the self-delusional wishing of a Gregg Easterbrook in *A Moment on the Earth*. The cumulative effect of Mr. McKibben's interwoven narratives is an invitation to understand that ecological cycles operate on far larger scales and far longer chronologies than wasteful, impetuous market economies can yet accommodate, and that sustainable living turns upon reconciling the differences. We are reminded in many artful, indirect ways that the promise of a technological fix only increases the likelihood that we will not constrain our

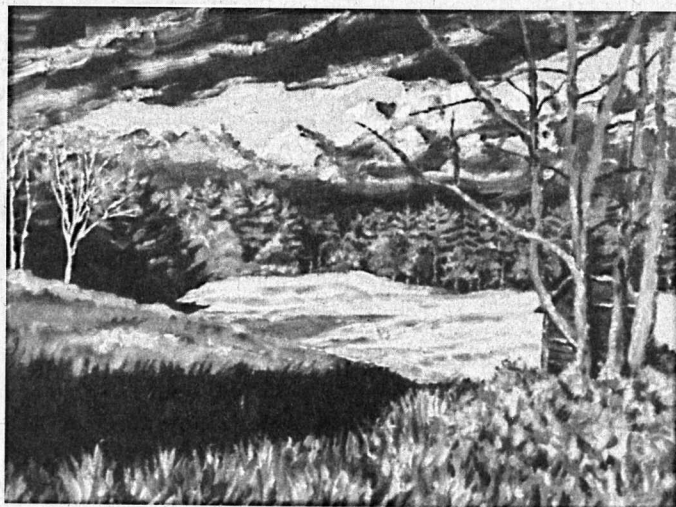
appetites in time to avert tragedy. Most important, this book offers the antidote to passivity and powerlessness in actual solutions. However incomplete or inadequate each may in itself be to avert ecological unraveling, the attempts emerge not from existing institutions but from people who actually live in affected communities and countryside, "people who are currently on the outskirts of political life in every nation on earth." As a more productive alternative to fear and threat, *Hope* offers us the essential, the only basis for the profound attitudinal and behavioral changes we must make if we are to avert global tragedy.

One way to get at the virtues of *Hope, Human and Wild* is to regard it as a sequel, not so much to *The End of Nature* as to the earliest and most enigmatic account of the Fall. Eight or nine centuries before Christ, the Greek Hesiod—

who shared Mr. McKibben's interests in social justice and the difficulties of living the Good Life—told the story in his *Works and Days* of how Zeus, "as the price of [Prometheus's theft of] fire," sent to humans "the sheer, impossible deception" of Pandora, bearing all the gods' gifts. Only after she was possessed in marriage did these gifts, scattered from a great jar, appear as "a sorrow to men who eat bread." If we had forgotten how persuasively Mr. McKibben can interpret this darkest part of the story, he linked his earlier diagnosis of reduced fossil fuel use with the central theme of this book in a terse article for the *New York Times Magazine* just before *Hope* appeared. "The sweet dream that we'll all grow rich enough to turn green is simply that—a dream, and one that will turn

into a nightmare if we try to follow it"; the prescription is the same as *Hope's*, but the tone is bluntly heretical: "brute objectivity requires new ideas about what constitutes sufficiency." Tone makes all the difference.

Hope, Human and Wild does more than interpret the curious end of Hesiod's story. "Hope was the only spirit that stayed there in the unbreakable closure of the jar, under its rim, and could not fly forth abroad, for the lid of the great jar closed down first and contained her. This was by the will of cloud-gathering



Zeus" (trans. Lattimore, ll. 59-104). Mr. McKibben's book pries open the lid, allowing us to glimpse a simple, profound truth that our own experience will confirm: no matter how great the human weakness and suffering, no matter how great the evil, no remedy is possible without hope. Our culture's myths require constant reconfiguration to cushion the losses of faith, to dampen the shocks and accept the changes that rush upon us. Without such redemptive visions as Mr. McKibben's, the future may soon appear to us under the paralyzing Dantesque inscription, "abandon all hope, ye who enter within." ●

—Reviewed by Michael Wilson, associate director of Sagamore Institute and humanities professor at Paul Smith's College (Paul Smiths, NY 12970)

THE COMING PLAGUE: NEWLY EMERGING DISEASES IN A WORLD OUT OF BALANCE

by Laurie Garrett; Farrar, Strauss and Giroux (19 Union Square West, New York, NY 10003); 1994; \$25 hardcover; 750p.

That humanity had grossly underestimated the microbes was no longer, as the world approached the twenty-first century, a matter of doubt. The microbes were winning.

We who concentrate on the charismatic mega-fauna lament that humans have put an end to evolution. Quite the contrary; as Laurie Garrett reminds us, evolution is proceeding apace, accelerated by human hubris. True, the evolution is that of bacteria, viruses, and other microbes; but anyone who reads *The Coming Plague* must conclude that these will affect our societies deeply.

The Coming Plague is interdisciplinary and will be a valuable source document in many fields. Garrett knows how bacteria and viruses mutate. She relates those mutations and their consequences to human actions in the natural world.

In writing the book, Garrett has drawn on her own extensive experience in Africa, as well as research from around the world. The result is a thoroughly researched, well documented, extensively foot-noted record of the rapid emergence and dissemination of such life-threatening diseases as Ebola, AIDS, Hanta, Lassa, Toxic Shock Syndrome and Legionnaires. Chapters interesting to a knowledgeable biologist will also be intelligible to a lay person, so well does she explain the concepts of recombinant DNA, genetic mutation, and diseases jumping species.

Unlike most disease specialists, Garrett searches for the environmental and ecological vectors of disease. She weaves the emerging plagues into their surrounding cultural, ecological, and social conditions. She recognizes the critical roles played by human over-population, pollution, toxic agriculture, global destruction of habitat and species, and naive trust in antibiotics. Economic imperialism, women's subordinate sta-

tus, rapid transport and war, have all influenced the grim picture now evolving.

Garrett puts disease in a global and historical context. She tracks epidemics through history. She recounts the course of modern health care—from certain optimism that antibiotics could cure and technology eradicate most diseases, to the current global village where Ebola is only a plane ride from an African town to New York City.

The Coming Plague is also an unbiased report of the sequence of events in the AIDS, Hanta, Ebola and other epidemics. She offers fascinating insights into key scientists, bureaucrats and politicians involved in battles against epidemics. The reader is left with unabashed admiration for scientists who—with few supplies, no forewarning of the diseases they might find, still less how to treat them—ventured into unfamiliar territories and cultures, and in some cases, died.

However, this book is more than a tribute to dedicated scientists; it is an astounding exposé of the political maneuvering surrounding international aid. As one disgruntled scientist muttered, "The politicians are worse by far than the viruses."

The result is a depressing list of mega-projects whose impacts worsened conditions for humans but vastly improved the situation for microbes, of religious and tribal disputes manipulated by the super powers, of obscene amounts of money squandered on military forces with the consequent disruption of stable populations and ecosystems. Disease moved in to take advantage of large pools of starving people. Garrett neither judges nor condemns; she reports. *The Coming Plague* is very clear on how the intravenous drug culture and sexual promiscuity have amplified the spread of disease.

She lists the ecological effects of well meant programs: spraying to

eradicate malaria-carrying mosquitoes resulted in the sand fly that carries *Leishmania donovani* moving into the vacant niche. Some of the book's most intriguing passages have to do with genetic mutation and the transfer of disease from animals to humans. One such example is the mild Snowshoe Hare virus which in 1992 caused encephalitis in more than 100,000 people in northern Russia.

"It's almost an axiom," warns immunologist Sir MacFarlane Burnet, "that an action for short term human benefits will, sooner or later, bring long-term ecological or social problems which demand unacceptable effort and expense for their solution. Nature has always seemed to be working for a climax state, a provisionally stable ecosystem, reached by natural forces, and when we attempt to remold any such ecosystem, we must remember that Nature is working against us" (p. 213).

Garrett is clear about the consequences of unbridled human numbers. "The extraordinary, rapid growth of the *Homo sapiens* population, coupled with its voracious demand for planetary dominance and resource consumption, has put every measurable biological and chemical system on earth in a state of imbalance" (550). In 1994, "with nearly 6 billion humans crowded onto a planet that had been occupied by fewer than 1.5 billion a century earlier, something had to give. That 'something' was Nature" (551).

Viruses are infinitely more adaptable than humans. After reading Laurie Garrett's assessment of the havoc humans have wreaked on natural systems and of Nature's responses, one can only conclude that natural selection is indeed in full operation at the apex of the food chain! ●

—Reviewed by Trudy Frisk,
Kamloops, BC, Canada

THE WISDOM OF THE SPOTTED OWL: POLICY LESSONS FOR A NEW CENTURY

by Steven Lewis Yaffee; Island Press (1718 Connecticut Ave. NW, Washington, DC 20009) 1994; \$26.95; 434 pp.

Arguably, the Spotted Owl issue is the most controversial environmental policy issue in the history of the United States. Like other major issues such as Hetch Hetchy, Echo Park, the Wilderness Act, and the Alaska Lands Act, the Spotted Owl issue has been debated in the national arena by major policy players, including the President. Some of the characteristics that made the issue so vexing will also make future issues vexing: the issue encompassed a vast landscape, it affected private and public lands, it affected a significant economic enterprise, scientific knowledge was incomplete and complex, it involved fundamental value differences, and interest groups on both sides used every avenue in the American political system to further their cases.

Steven Yaffee's *The Wisdom of the Spotted Owl* examines the controversy in detail. In the first of three sections, Yaffee traces the Spotted Owl case through the fall of 1993, draws broader lessons from the specifics of the case, and offers a series of proposals for how we can better deal with such complex environmental policy issues in the future. At least for someone from outside the Pacific Northwest who was not directly involved in the issue and followed the Spotted Owl case with general interest, this section seems comprehensive and even-handed. Indeed, Yaffee's may be the definitive version of "what happened." Future accounts may differ in interpretation and emphasis, but they will be hard-pressed to offer more relevant details than Yaffee offers.

The Spotted Owl case stresses that the case had lengthy precedents, with its beginnings traced back to 1972 when biologists studying the owl discovered its reliance on old-growth habitat. For most of its history, the Spotted Owl case was *not* a federal endangered species issue. Rather, the issue was driven by state

endangered species laws, the National Forest Management Act's provisions for species diversity, and a desire by many of the parties involved—especially the Bureau of Land Management and the Forest Service—to prevent the species from being federally listed as a Threatened or Endangered species, which would move the issue outside the administrative control of the BLM and Forest Service. This effort came to naught when, after environmental groups intervened, the Spotted Owl was listed as Threatened in 1989.

In the second section of the book, Yaffee examines five main problems underlying the Spotted Owl controversy. First, a diverse set of interests and motives, extraordinary large stakes, uncertainty over the science and the economics, and conflicting values and time frames complicated the Spotted Owl issue.

Second, the United States political system is not designed to respond to complex problems well—the system is fragmented, reactive, and crisis-oriented. Part of the reason for this design is that the framers of the Constitution were very concerned with centralized authority and hence did not want to make it too easy for the central government to exercise that authority. As our environmental (and social and economic) problems become more complex, the federal government will continue to have significant problems in dealing with these issues. Two major alternatives to address this exist: to reduce the role of the federal government in policy (the Gingrich approach), or to increase fundamentally the capacity of the federal government to deal with problems (as occurred in the Progressive Era and during the New Deal-World War II period).

A third problem is the role of interest groups in making policy. Such groups—on all sides—have incentives

to cloud the facts and overstate their interests. Also, due to the multiplicity of access points in the American political system, these groups can always find another law or institutional venue to further their cause (e.g., if you fail within the Forest Service policy process, you can turn to the courts; if the NFMA doesn't work, you can try the ESA). This makes agreement on a complex policy issue difficult. Yaffee also notes the difficulty of coalitions speaking with one voice, an issue of rising significance within the environmental community. A weakness in this chapter is his failure to discuss the privileged position of business in the American political system: it has ready funds, existing organizations, and special access to government.

A fourth general problem is the nature of existing natural resources laws, namely the Multiple Use Sustained Yield Act, the National Forest Management Act, and the Endangered Species Act. Problems with these laws include the damage done by multiple demands, the unintended effects of forest planning (e.g., smaller clearcuts led to increased forest fragmentation) and its subjugation to the power of the appropriations process, and the effort to protect ecosystems with a law designed to protect individual species.

A final problem leading to the Spotted Owl controversy was that agency values (especially for the Forest Service) and standard operating procedures were counterproductive in dealing with a nonroutine situation. Among the problems within the organizational culture of the Forest Service that Yaffee points out are its post-World War II "can do" industrial approach, its inability to tolerate dissent, its strong socialization, and its poor use of public participation. The FS had three responses as the Spotted Owl issue evolved: to ignore it, to deal with it through standard operating pro-

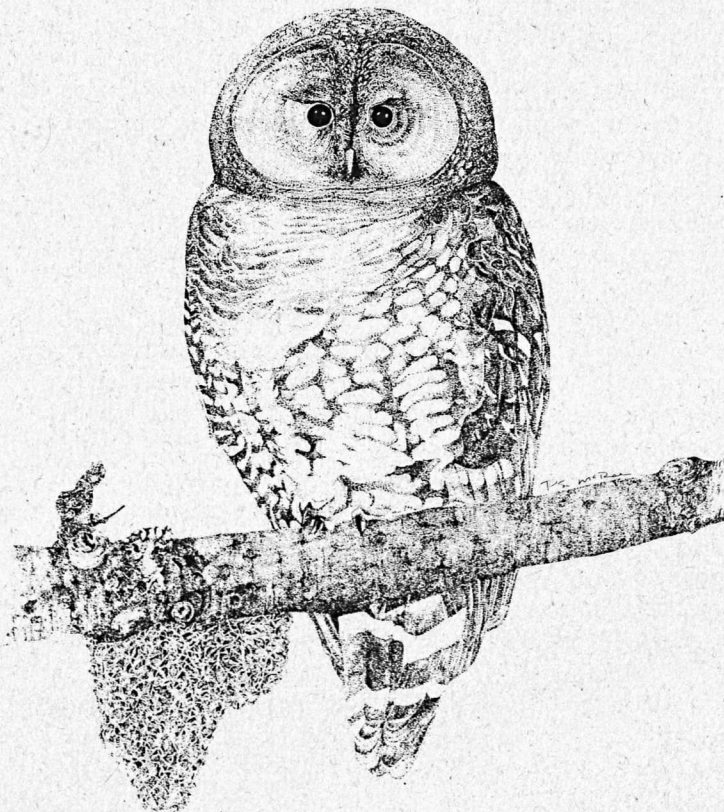
cedures (which didn't work), and to act strategically on behalf of the agency itself. Another major part of the problem was poor leadership within the FS. This lack of leadership was partly responsible for the lack of dialogue among groups within the region, which helped lead to the intense polarization over the issue.

In the final three chapters of the book, Yaffee offers his vision of the future in environmental and natural resources policy. He sees significant parallels between the late 1800s and the late 1900s, and believes a new movement analogous to the Progressive conservation movement is needed. I concur on these points. Our society and political system are faced with heightened issue complexity and reduced governing capacity. The increased complexity is due to expanding and conflicting public values and ambiguous and conflicting norms. The reduced capacity is due to declining slack in our stressed natural systems, diminishing government fiscal resources, fragmented power due to the tremendous rise of interest groups, and limited vision and insufficient guidance. Although his observations are accurate, I think Yaffee takes the status quo too much for granted. On fiscal realities, for instance, he does not discuss the importance of the antitax rhetoric that has so changed the national political picture in the last twenty years. As a nation we have the capacity to pay significantly more taxes; we are the least taxed developed nation in the world, so this is an issue of political leadership and education rather than fact. Turn-

ing to fragmented power, he fails to discuss reasons why business has the potential to dominate the political arena, and offers only a very brief discussion of the new conservation movement.

There are reasons to be optimistic, though. Conflict, Yaffee writes, creates windows of opportunity for change; there is a generational shift in leadership occurring within our political system, including in the Forest Service; some aspects of our public land management approach have worked well and give us something to build on; and we are in a period of rapid development of new ideas for land management. My own work on public lands politics leads me both to agree and disagree with Yaffee on two of his points. I agree that we are in a period of potentially dramatic change in public lands policy, a period more open to change than any since the foundation of public lands management in the late 1800s and early 1900s. It is also clear that significant change within the Forest Service is under way in terms of increased professional diversity. I am more skeptical when Yaffee writes, "Part of the reason to view this process of revitalization and renewal with optimism is that the core theories and operating principles of the Forest Service are not wrong, they just got bogged down in the values of the 1950s and 1960s; and need to be updated in a real (not token) way for the 1990s" (pp. 324-325). I don't think the Forest Service—or the natural world—will be well served by updating Gifford Pinchot for the twenty-first century. The agency would be better served by replacing Pinchot with Aldo Leopold as its touchstone thinker. (I sent this suggestion to the Forest Service as part of its reinventing government initiative. A year later, I am still waiting for a response.) Leopold's land ethic could serve as a much stronger grounding than "the greatest good of the greatest number in the long run," or multiple use and sustained yield. These latter phrases leave the Forest Service in charge of determining what is in the public interest; and as its past behavior has demonstrated, it has been biased to further a particular private interest and it has not handled public participation well. Similarly, despite its rhetoric, the Forest Service has not been good at science-based management (see Schiff's *Fire and Water*, 1962).

To improve the Forest Service, Yaffee recommends a series of changes: creating new mechanisms to bridge the agency-nonagency boundary; improving organizational management, especially leadership; improving information gathering and analyzing; and developing ways to promote creativity and risk-taking within the agency. He recommends changing the long-standing agency practice of frequent transfers. This technique has been used to build organizational loyalty and prevent employee capture by local interests, but it sacrifices local knowledge and commitment to a place. He also argues that the Forest Service should be a leader in new land management



approaches, in brokering compromise, rather than dragging its feet fighting for the status quo. Regarding information analysis, Yaffee writes, "Many respondents [to his interviews] felt that the FS and others had filtered information strategically, or interpreted information in an obviously biased manner. Others felt that agency officials had lied outright at times in the course of the debate" (p. 348). *Is this a surprise?* It seems very naive to me—as a political scientist—to expect an agency to interpret information in an unbiased manner. Agencies, like interest groups and people, have their own biases and these will influence their interpretation of information, either consciously or subconsciously. Indeed, many scholars suggest that there is no such thing as unbiased information. So to suggest that the Forest Service—or any agency—will become a purveyor of truth, justice, and the American way seems too much to hope for. Some of Yaffee's suggestions come out of the reinventing government school of thought, but my own work on public lands suggests that it will be extremely difficult to change the dominant idea on which an agency or policy is based. Efforts since the mid-1960s to shift the thinking within the Forest Service have not changed much so far.

In his final chapter, Yaffee recommends four ways to build better policies: (1) shifting and clarifying the objectives of resource policy: a stronger focus on ecosystem level biotic health through a variety of policies, laws, and agencies—not just the ESA—and new public lands designations modeled on Wild and Scenic Rivers, such as national conservation lands, national multiple value lands, national commodity lands; (2) changing incentives and providing opportunities: reducing federal subsidies for use of resources from public lands and effective regional scale planning; (3) enhancing the capacity of individuals and institutions; and (4) public resource management as a model of excellence.

Yaffee closes by writing that "'new perspectives,' the 'new forestry,' 'ecosystem management,' and 'landscape ecology' and whatever other slogans arise in an agency fond of such labels, must bear fruit in order for the agency to regain an image of trustworthiness and legitimacy, an image that has been tarnished by the events of the spotted owl and other recent controversies. The window of possibilities is open now, and change must not be of a token or simply rhetorical nature" (p. 377). This relates to the fundamental question raised in the final two sections of the book: can we reform the policy process and the Forest Service so as to avoid the polarization and conflict that was so apparent in the Spotted Owl case? Yaffee does a good job of suggesting ways to reform the system, but this begs a larger question: Will incremental reform do the trick, or must we move in bold new directions? Better process will definitely help, but what can it offer if segments of society have fundamentally different values? These larger questions will form the landscape of environmental policy in the twenty-first century. ●

—Reviewed by Chris McGrory Klyza, coeditor of *The Future of the Northern Forest*, author of the forthcoming *Who Controls Public Lands: Mining, Forestry, and Grazing, 1870-1990*, and political science professor at Middlebury College (*Program in Environmental Studies, Middlebury College, Middlebury, VT 05753*).

SLIDE MOUNTAIN OR THE FOLLY OF OWNING NATURE

by Theodore Steinberg; University of California Press (2120 Berkeley Way, Berkeley, CA 94720); 1995; \$24 Hardbound; 212p.

In *Roughing It* Mark Twain recounts an apocryphal tale that poses a tough legal question. When a landslide sends Morgan's ranch down Slide Mountain to cover Hyde's valley farm, who now owns the land? Law books, deeds on file at the courthouse, and witnesses all support Hyde's claim; but the judge rules for Morgan. If God decides to move Morgan's ranch, he reasons, then man will have to live with it. The law provides Hyde poor consolation: he still owns the undated soil. The tale, a practical joke perpetrated by locals on a new lawyer, suggests the absurdity of one of our culture's strongest convictions: that nature is an ownable commodity.

History professor Theodore Steinberg uses the story to begin his review of five real legal disputes, each confirming his thesis that our fixation on ownership of nature and the accompanying law of property have "not just confused but impoverished our relationship with the natural world." But having amply supported his thesis, Steinberg then refuses to place blame where it belongs. Instead he claims that "in the majority of cases the law of property works quite well to help control and own the natural world." This reluctance to deeply question our zeal to own nature diminishes an otherwise well-documented and valuable book.

The first case concerned Native Americans and a shifting river. As original human occupants of North America, the Omaha Indians, according to Lewis and Clark, "had no idea of exclusive possession of the soil." However, as white settlers moved in, they tried to salvage a portion of the land they'd roamed for generations by agreeing to a treaty setting aside reservation land hard by the Missouri River. Then the river moved. When it did, land that had been part of the Omaha's Nebraska reservation ended up across the river in Iowa. There, white settlers claimed it.

The Omaha sued to regain the land. The trial focused on how nature had moved the river. If the shift resulted from accretion (gradually shifting soil), it belonged to the settlers; if from avulsion (sudden build up of soil), it belonged to the Indians. Most of the shift, the judge ruled, had been caused by accretion. The Omaha were awarded only a small portion of the land.

Steinberg notes that while property law doctrines serve to portray our legal or economic relation to the land, they fail miserably to address the environmental

and social relations between people and land. To the settlers the land had become like a home. But, as Steinberg points out, envisioning the land as a house that they built “meant denying that it once belonged to the Omaha,” and “repressing the role that an uncontrolled Missouri played in delivering the property into the hands of the white people.” To the Indians the land was not their exclusive possession, but open ground from which they should not be banished. According to the settlers’ law, nature had rendered even that minimal claim illusory.

The second case also concerns a body of water, its shifting character, and shifting characterization. Louisiana’s Six Mile Lake had once been a wide body of water. It narrowed as current deposited newly-formed land (alluvion) on its banks. Classifying the lake became critical because under state law, alluvion along streams belongs to the adjacent landowner, while alluvion along lakes belongs to the state. The Louisiana Supreme Court held that Six Mile Lake was a stream. Then the court reversed itself, deciding that even a lake with a current sufficient to carry silt—one that looks like a river—can still be a lake, especially if it has always been called a lake.

Thus, naming nature invests natural objects with legal consequences. As Steinberg notes, however, names cannot define the physical reality of a lake. Nature is too elusive for that.

More elusive water, this time percolating subsurface water, is the subject of the third legal dispute. When settlers began pumping from underground aquifers in the Arizona desert to irrigate cotton crops, legal battles began over whether water belonged to the surface landowner or to the first to find and pump the water (the traditional prior appropriation law of natural resources). First the Arizona Supreme Court applied the prior appropriation rule, then it reversed itself and ruled for the surface owners.

Steinberg asks whether, in light of our dependency on water, the man owns the water or the water owns the man. Considering how courts and laws vacillate, one might also wonder whether artificial rules impoverish what could be a noble relationship with nature.

Steinberg’s final two cases raise us from the mundane (underground) to the sublime (overhead). Can a landowner demand natural weather conditions? A group of farmers sued their neighbors to stop them from seeding clouds, claiming it had caused a drought in their area. They won a limited victory. According to the court, technological in-

terference with their weather could only be justified if necessary in the public interest. In the eyes of the law, this case indicates, ownership rights to the weather depend on the needs of the public.

The final case—actually a series of examples—applies property law to an even more abstract aspect of the natural world. “In a culture in which everything must have an owner,” he shows, “even something as diffuse as airspace could become property.” In response to the crush of high-rise building in New York City, the city restricted airspace above each lot that an owner could fill. Then it created a market for that air in the form of Transferable Development Rights (TDRs). Steinberg recounts battles for TDRs over several famous buildings including Grand Central Station and Trump Tower. He notes ruefully that “while claiming to solve some problems, [TDRs] force the ideology of exchange further into the marrow of daily existence.”

In fact, New York’s churches, in particular Park Avenue’s St. Bartholomew’s Church, turned to trading their TDRs to promote church programs. St. Bart’s needed the money—in effect it felt it had to destroy itself to save itself. The courts refused. Steinberg wonders about the “sanity of a culture in which the goal of preservation is reached only through destruction.”

Insane though he has proven it to be, Steinberg surprisingly concludes that universal ownership of nature is workable, indeed inevitable. He sees the only real difficulty on the margins. But the viability of legal and ethical propositions is commonly tested on the margins; judges pose sometimes outrageous hypotheticals to test the sturdiness of a lawyer’s argument. The great value of this book is in its use of real cases to challenge an entrenched but outdated legal institution.

Having failed to challenge universal ownership, Steinberg misinterprets the passage from Thoreau’s *Walden* with which he concludes. He claims that Thoreau dreamed about owning a slice of the earth. But, in fact, Thoreau debunked the notion of land ownership. Thoreau believed he already “owned” all the land that mattered—the aesthetic, not the productive part. He walked freely through it and coveted no deed. Steinberg concludes that, because we believe we cannot afford to let any of nature alone, ours is an impoverished culture. Because he fails to deeply question modern property law, however, he fails to confront the culprit. ●

—Reviewed by Michael Martin, a lawyer and writer who lives in Fairfax, VA

GUARDIANS OF THE PARKS: A HISTORY OF THE NATIONAL PARKS AND CONSERVATION ASSOCIATION

by John C. Miles; Taylor and Francis (1900 Frost Rd., Suite 101, Bristol, PA 19007); 1995; \$29.95 hardcover; 363 p. with photographs and index

America's National Parks are precious fragments of God's earth desperately in need of guardians who care about them and are willing to stir the public pot and raise a ruckus, without fear or favor. The parks are inadequately protected by their assigned protectors at the National Park Service, who spend too much time in waltzing willingly to political tune callers and in foolish bureaucratic restructuring, assiduously avoiding the tough issues of park abuse and misuse.

This new book is not about the National Park Service, at least not directly, but rather about the citizen organization that serves as "watchdog" for the parks. The author, John Miles, has compiled useful data concerning the external and internal struggles of the National Parks and Conservation Association. At times NPCA (formerly National Parks Association) may not have been as effective as possible, but through the years has been led by energetic individuals wholly committed to the parks cause, including Robert Sterling Yard, Devereux Butcher, Fred Packard, Anthony Wayne Smith, and now, for the past fifteen years, Paul Pritchard. To its credit, NPCA has often been willing to take on the agency it watchdogs, in contrast to the American Forestry Association, the chronic public front and apologist for deeds and misdeeds of the US Forest Service.

I recall how Devereux Butcher, as a case in point, fought with all his might to keep National Parks from being reduced to popcorn playgrounds. He protested construction of a commercial tourist development at Flamingo, a prime wildlife location at the edge of Florida Bay in Everglades National Park. Then, after being forced out of the National Parks Association, he launched his own monthly publication, *National Wildland News*. In the issue of November 1960, he reported as follows:

Hurricane Donna, in September, seemed an expression of outraged nature striking back at man's violation of one of the world's truly superb nature sanctuaries—Everglades National Park.

When Everglades National Park was established in 1947, the National Park Service had an opportunity to show it had discovered the present day needlessness of resorts inside the national parks, and to demonstrate how a great nature sanctuary should be administered. Instead, it clung

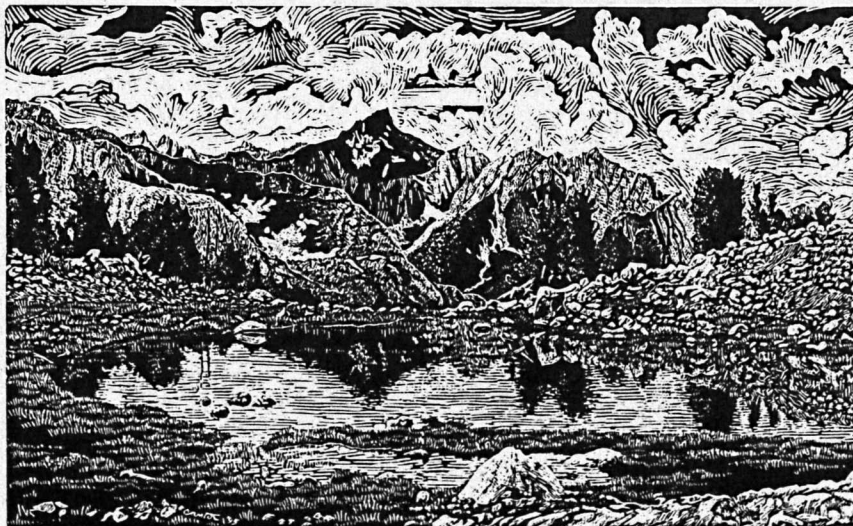
to the outmoded concept of the stagecoach era that hotels are necessary in the park's heartlands. Without overnight accommodations, reasoned the Service, visitors would not get the kind of experience they should have. Whereupon the Service authorized, under Mission 66, a big yachting-fishing resort of the kind that are a dime a dozen in Florida, to be built in the heart of the sanctuary.

After the Flamingo development was flattened by Hurricane Donna, Butcher suggested it be rebuilt near the park entrance, while restoring the natural scene at the site. But the Park Service ignored such opportunities, then and thereafter.

Miles traces the growth of NPCA to its present membership of nearly 500,000. With this new strength, hopefully its best days are yet to come. An appreciable number may have joined in response to direct mail solicitations, but NPCA does much good work, as in exposing and resisting the Contract with America's park closure scheme, spreading the gospel through the March for Parks, and stimulating the organization of local park friends groups.

Of course, those friends should always champion the parks first and foremost, and avoid cooption by park superintendents. Grassroots groups need to stir the pot and raise a ruckus—indeed, we all need to. ●

—Reviewed by Michael Frome, Ph.D., author of *Regreening the National Parks and Chronicling the West—Thirty Years of Environmental Writing*, scheduled for spring 1996 release by Mountaineers Books



Mount Clarence King (Kings Canyon National Park) by Evan Cantor

OUR LIVING RESOURCES

by US Department of Interior—National Biological Service
(Washington, DC 20240); 1995; \$44; 530 pp.

Here it is. The long-awaited first (and maybe the last) publication of the National Biological Service, the new department formed by Babbitt to bring honesty and accuracy back into the conservation of our living resources. It's a beauty with colored photos and graphics, tight little vignettes of many US animals and plants, portraits of a few ecosystems and ecoregions, and mini-essays on special issues (climate change, non-native species, habitat assessments). You fall into enthusiasm and hope, entranced by stylishness, the tight semi-scientific writing, and the continental coverage. You may even feel proud that you contributed an article (as I did on the status and trends of the Sky Island ecosystems of the Southwest). Then you step back: What *are* America's major ecoregion hot-spots? What *are* the major issues?

Slowly, the glitz fades. The coastal temperate rainforests (Pacific Northwest), North America's grandest wetland (the Everglades), and the San Francisco Bay and Columbia River drainage basins are not mentioned. The grossest gap is the Everglades. The melaleuca tree invasion, the plight of the Snail Kite (well, one paragraph, with no mention of the Everglades and water flow issues), the devastating scale of wetland loss, and the pollution by the sugar-industry receive no attention. Even Bill Wilen's article about the nation's wetlands skips the Everglades. The article on the Florida Keys grays out the Florida River, which collects sugar-plantation biostimulants that contribute to the demise of coral reef fish and other near-shore critters. Similarly, there is no vignette of the Northern Spotted Owl; and no trend or status report on migratory salmonids and smelt along the northern Pacific Coast.

Readers of *Wild Earth* will search in vain for the Big Picture view required for large mammals. There is no discussion of habitat corridors or the deleterious impacts of habitat fragmentation. Those readers in search of conservation biology principles will find them scattered and scarce. Concepts like *survival habitat* (the minimum habitat size required for short-term survival) and *minimal viable population* vs. *recovery population* have apparently not yet entered the thinking of NBS or the majority of its contributors.

In talking to the much beleaguered Ron Pulliam, the Director of NBS and one of the most admirable biologists trying to make a difference, he insisted these omissions were not intentional. Let's hope so and give NBS the support it needs just to survive. Confronted by yahoo politicians who wish conservation science would just disappear, *Our Living Resources* can be useful in persuading others that biodiversity matters. The book has fine vignettes on everybody from the Tarahumara Frog to the American Badger. Numerous small mistakes (e.g., the Chiricahua Mountains are in Arizona, not New Mexico, as stated) are easily forgiven. It's neither the misinformation nor the disinformation but the selective uninformedness that casts a cloud. ●

—Reviewed by Peter Marshall, conservation biologist and an editor of the Whole Earth Review

LIFE ON THE EDGE: A GUIDE TO CALIFORNIA'S ENDANGERED NATURAL RESOURCES

by Carl Thelander, editor in chief; Heyday Books
(POB 9145 Berkeley, CA 94709); 1994; \$45 paper-back; 550 pp.

If you live in California, this is among the top five books ever written on your state and the state of your state's biodiversity. *Life on the Edge* is a loving web of texts: Native American prayers and origin stories, historical narratives on the fate of California wildlife and on the causes of the problems (especially waterworks), scientific vignettes of every threatened population from fringed-toed lizards to whales, quotes, interviews with the scientists most intimate with the wildlife, fun poems. These texts are intertwined with eye-contemplative (vs. calendar-pretty) illustrations: photos, distribution maps, drawings, cartoons, Native American paintings, etchings, any image that works. *Life on the Edge* should become the standard text for California K-12 and no naturalist or conservationist should be without it.

Life on the Edge originated as Southern California Edison's educational manual for its employees who work within endangered species habitat. Its popularity led to this 550 page titanic volume—authored by a private consulting firm (BioSystems), Con Edison, and Audubon, and distributed by Heyday Books (one of the great small publishers of gentle but robust information). Kind of *Wild Earth* exorbitantly well funded. *Life on the Edge* is so attentive to interconnectedness that the preface describes the process and issues involved in choosing the appropriate kind of book paper in an inadequate market-world.

If you want to publish your own bioregion's history on the destiny of its wildlife and its entanglement with human life, this is the best book I have seen. It vibrates with an impressive educational hope. It is a model of the "new" enviro-history that needs to balance the commodity and conquest history of the past. As E.O. Wilson points out, it takes the abstraction "biodiversity" and gives it everyday value. In short, a rare gem. ●

—Reviewed by Peter Marshall

SILICON SNAKE OIL: SECOND THOUGHTS ON THE INFORMATION HIGHWAY

by Clifford Stoll; Doubleday (1540 Broadway, New York, NY 10036); 1995; \$22 hardcover; 247pp.

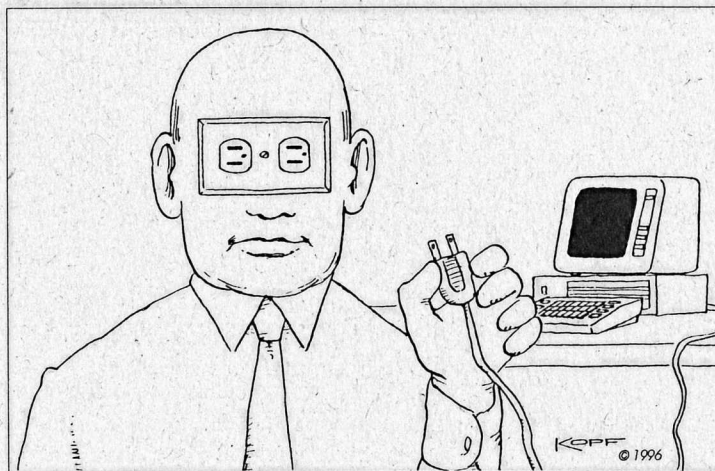
The main ingredient of "silicon snake oil" is "a technocratic belief that computers and networks will make a better society" (p. 50). They will not, Clifford Stoll explains. Networking, in fact, may draw our attention away from the real world. Networks "isolate us from one another and cheapen the meaning of actual experience" (p. 3). The Internet conveys data, but data are not knowledge.

An astronomer at the University of California at Berkeley, Stoll has been involved with networks since their creation and is a computer security expert. Nevertheless, he has become increasingly ambivalent about networking and computers in general. *Silicon Snake Oil* shows the liabilities of electronic library catalogs, computer shopping, computer information services, computer modeling, computers in schools....

Stoll writes in the first person, and the issues he addresses reflect his personal concerns. The book is not an exhaustive critique of computers. Effects on the health of users and on the job market are not discussed, for instance. Stoll's views on electronic (e-) mail and on the World Wide Web illustrate his perspective.

Like the editor of *Wild Earth*, Stoll views the first class postal system, not e-mail, as "one of the wonders of the twentieth century" (p. 166). It is certainly more reliable. Stoll's brother on the east coast mailed him a postcard a day for two months. At the same time Stoll sent himself e-mail from five different remote accounts. All the postcards arrived; five of the e-mail messages failed to make it. The postal service often successfully copes with incorrectly addressed letters; the Internet never. E-mail messages all look alike and lack warmth. E-mail letters are often carelessly written. (Because a computer user can easily correct errors if he so chooses, he is likely to write sentences before thinking them through.) If one belongs to news groups or lists, one's e-mail may be largely junk mail. Cyberspace sorely lacks "genuine editors" to separate the dross from the gold.

As for the World Wide Web, "it's easy to make fancy home pages"; but, when seeking information on the Web, even networking experts are likely to become lost "in a twisty maze of cross-references" (pp. 196-197). The Web is suited to key word searches, but key word access is not equivalent to good indexing. As with computer searches in general, the researcher does not know what material he misses. Reliance on the computer arbitrarily narrows the field of research.



Whatever the effectiveness of computer searches, the days of the Internet may be numbered. The system will deteriorate if a means of forcing users to pay for sending and receiving information is not put in place, Stoll says. Currently users do not help to fund the infrastructure or management of the system. Viewing it as free, they flood it with messages. Already the system slows down when many users request files from one location. Increasing bandwidth is touted as a fix. Such an increase, Stoll says, would have no more effect on electronic congestion than increasing highways has had on traffic congestion.

The book is not well organized. Chapters tend to fragment into individual, though highly quotable, paragraphs and sentences. The disorganization must be due in part to the fact that Stoll wrote portions on a computer (he invites readers to guess which portions and provides the answer in a cryptogram). An index partially compensates; and, as Stoll mixes humorous accounts of his experiences with general observations, the book is entertaining.

In the opinion of this reviewer, *Silicon Snake Oil* is a must for individuals and organizations owning or thinking of buying a computer and modem. Many readers will find it therapeutic. Learning that even computer experts regard software manuals as frustrating, for example, is comforting. All should find it thought provoking. Would you be more effective if you jettisoned or at least decreased the use of your modem? Are the massive investments by organizations in networking a waste of resources? Stoll forces us to ask such questions.

Contrary to popular belief, "the Internet, that great digital dumpster, confers not power, not prosperity, not perspicacity," Stoll states. It is a purveyor of facts and a consumer of time. Government officials, teachers, librarians, journalists, and conservationists need to hear and heed his words. ●

—Reviewed by Mary Byrd Davis, Yggdrasil Institute (POB 131 Georgetown, KY 40324), editor of *Eastern Old-Growth Forests: Prospects for Rediscovery and Recovery* (Island Press 1996)

LANDSCAPE AND MEMORY

by Simon Schama; Alfred A. Knopf (201 East 50th St., New York, NY 10022); 1995; \$40; 652 p., illustrated

Schama's main concern is with the fears, desires, myths, and religious concepts that shape our reactions to nature and turn it into the human category of landscape.

Although it has much to say about forests, rivers, and mountains, *Landscape and Memory*, the monumental new book by Simon Schama, is not so much a work of "nature writing" as it is a cultural history. Schama's main concern is with the fears, desires, myths, and religious concepts that shape our reactions to nature and turn it into the human category of landscape. "Before it can ever be a repose for the senses," he writes, "landscape is the work of the mind. Its scenery is built up as much from strata of memory as from layers of rock."

In each of the three main sections of the book—"Wood," "Water," and "Stone"—Schama shows how the human imagination has romanticized or demonized nature. His examples, bolstered by dozens of reproductions of engravings, photographs, and landscape paintings, are intriguing even when somewhat arbitrary. We learn how Yosemite and the redwood forests became quasireligious, quasipatriotic shrines, and how the ancient scheme to carve Mount Athos into the form of a man inspired Gutzon Borglum, relentless self-promoter and Klansman, to create the monument at Mount Rushmore. Schama's erudition ranges from Robin Hood to Bernini to the modern German painter Anselm Kiefer, and he is a sensitive interpreter of visual as well as written evidence, able to draw out the nuances of a painting or sculpture in the light of its own time.

Yet Schama is not entirely at home in the outdoors, as certain details reveal. He describes the peasants hired as guides for an early ascent of Mont Blanc as "skeptical" because they carried candles and tinder with them in case they had to spend a night on the mountain. "Prudent" might be a better word. He alludes flippantly to the fear of Father Fabri, who navigated the Nile in 1483, that "wallowing hippos" would "attack their boats and devour the passengers in their slick, pink maws." Fear of hippos is well justified, as Africans and travelers in Africa know. Still, Schama's journey to the Polish forest, described early in the book, proves that he is not content to reach all his conclusions in the library, and inspires some vivid, though densely worked, description:

Much of the woods lie under water. Fallen trunks lying across the course of streams create black ponds, twenty feet deep, and odorous peat-swamps filled with frogs and thunderfish and covered with a gray coating of algae from which, during spring and summer, blades of iris and marsh marigold sprout, like tufts of hair on a bald man's pate.

In the end, *Landscape and Memory* seems to imply that everything is landscape. While Bill McKibben's *The End of Nature* concluded with anguish that human beings have changed the environment so profoundly that even our weather is artificial, Schama takes this same idea as a calmly accepted starting point. Maintaining that people have been altering natural ecosystems "since the days of ancient Mesopotamia," he holds that "it is this irreversibly modified world, from the polar caps to the equatorial forests, that is all the nature we have."

The quotation from Thoreau that Schama chooses to begin and end the book seems intended to make that point. Thoreau writes, "It is in vain to dream of a wildness distant from ourselves. There is none such. It is the bog in our brains and bowels, the primitive vigor of Nature in us, that inspires that dream." Schama appears to interpret this as meaning that wildness is always qualified, that the earth has been domesticated. But Thoreau, though he located himself on the margin between town and forest, recognized that raw wilderness still existed. You can see this in the wariness that pervades his book *The Maine Woods*, in particular his deranged-sounding description of the harsh rock summit of Mount Katahdin. If *Landscape and Memory* is sometimes unsatisfying, it is because the author seems more interested in manicured Arcadias and ornamental fountains than in serious wilderness. ●

—Reviewed by Geoffrey Wisner (12 Suffolk St. Apt. 2 Cambridge, MA 02139), who frequently reviews books on African and environmental topics

WHY WE GARDEN: CULTIVATING A SENSE OF PLACE

by Jim Nollman; Henry Holt & Co. (115 W. 18th St., New York, NY 10011); 1994; \$25 Hardcover, 312 pp.

Should wilderness advocates care about a book on gardening? Perhaps not unless it's Jim Nollman's latest work, *Why We Garden: Cultivating a Sense of Place*. This book is not about gardening in the typical sense. Rather, it invites us to see "plants as collaborators" and organic gardening as a doorway to the sacred in nature, a portal perhaps as valid as the wilderness. "Nurturing a sense of participation with nature through the garden," writes Nollman, "expands the context of our attention—our watering, our planting, our harvesting, our enriching—beyond the garden wall, now to include the ecosystem we inhabit, our sense of community, and even the Earth itself."

This work sends an arrow to the heart of what may be a significant failing of the environmental movement. "What the environmental community may lack most," suggests Nollman, "is an ability to engage people in their daily lives in a positive creative and joyful manner." "Daily" is the key word here and as both a wilderness activist and passionate gardener myself, I believe the author has indeed identified a vital element conspicuously absent in most front-line environmental writing. Nollman cautions deep ecologists against anointing "wilderness as the only true font of the sacred." When they exalt wilderness to the exclusion of the rest of the world, he feels, they deny the "equally sacred potential of the 'middle ground' that lies in the center of all our lives, [and] limit their important message to a wilderness priesthood."

Prairie scientist Wes Jackson makes a related point in his wonderful book, *Becoming Native to This Place*. "To treat wilderness as a holy shrine and Kansas or East Saint Louis as terrain of an altogether different sort is a form of schizophrenia. Either all the earth is holy or none is. It is possible to love a small acreage in Kansas as much as John Muir loved the entire Sierra Nevada. This is fortunate, for the wilderness of the Sierra will disappear unless little pieces of non-wilderness become intensely loved by lots of people."

In an era where wildness is unraveling all around us, it is vital to link our backyards, our gardens and countrysides to the wilderness, if not in a physical sense (though sometimes this can be done as well) then in a spiritual one. The sacred resides in them all. The roughly 70 million gardening house-

holds in this country represent a bounty of potential wilderness advocates who could be drawn into the fold through a newly articulated relationship between gardening and the environmental exigencies of our time. Nollman lays the groundwork for this relationship, offering the garden as *the* essential tool within the center of profane society, which can remold culture "to embrace the sacred on a daily basis."

Some wilderness advocates disdain gardening because our break with nature can be traced to the introduction of agriculture; yet this may be precisely the terrain to begin the healing of our culture. Nollman thinks so. "Gardening's greatest gift is the control of humans by Nature," he asserts. This is the lesson of the garden; and from the first page, the author sets to the task of excising antiquated gardening terms that promote domination and have obscured this lesson since the beginning of agriculture. He replaces worn out terminology with a more participatory language that treats "plants as living things (even living beings), soil as an ally, and the garden as a guide and mentor aiding us in our struggle to reconnect with the Earth at the place we live." Following the seasons, the book's chapters offer 12 "conceptual" gardens (The Political Garden, The Predators Garden, The Weed Garden, The Soil Garden, The Sacred Garden...) which explore in profound and witty ways the notion that plants may indeed collaborate with us in recovering our sense of place.



YEA! GARDEN, linoleum cut by Suzanne DeJohn

Wendell Berry advises us to invest in the millennium by planting Sequoias. I took Wendell up on his sagely advice, as did Nollman who writes eloquently about the value of such acts in his chapter *The One Tree Garden*. In comparing the Sequoia he planted to awe-inspiring places like the Grand Canyon or Alaska's Mendenhall Glacier—places that embody a “temporal charisma” which helps us understand our place in time—he makes an important point about the inaccessibility of the grand places that most commonly stir our love of wildness. Photographs and passionate nature writing of such places are incapable of affecting Nollman “in any way commensurable with the daily experience I glean so easily while sitting with that little sequoia... Because the little sequoia grows right here in my own yard it keeps the fire lit better than anything else in my life.”

Indeed, the “deep gardening” that Nollman articulates so well keeps the fire lit for increasing numbers of us. Hope resides in that fire for, as he asks, “unless we figure out how to heal the Earth from the place we already live, is there any real hope of healing it anywhere else?” *Why We Garden* is a passionate call to link the wilderness to the organic garden—“the single most meaningful and accessible step any of us can take to end the hegemony of the centralized technological fix that has become so central to our lives and so debilitating to our ecosystems.” ●

—Reviewed by Daniel Dancer,
Underwood, WA, environmental photographer, artist and gardener.

There is no name for this happiness

*Even as
I tamp the dirt
around these urgent stems and vagrant roots
their names escape me
fly away like flawed introductions
Cineraria, torn label, gives me the slip
Salvia, Campanula, Coriopsis cut loose
like fugitive prayer flags.*

*Left behind I prod the earth
sing an untitled song to golden ragamuffins
pray the violet creeper, that drifter,
escapes the edges of its box.*

*Locked in a deeper place
(pale forget-me-not)
plain words remain
water, rock, mother and tongue.*

*Alone at night
I wander the house
not knowing when to eat
or go to bed. I think that I will come to nothing.
I do not know what to call this time,
solitary, brimming.*

*The flowers, beautiful outlaws,
grow in their rich dark.
I know. When I don't sleep I watch them
the purple faces of strangers
turning this way and that.
I'll show you when you come visit
these gardens, these unnamed delights.*

—Marty Williams

NEW Road Report

Northwest Environment Watch (NEW) recently released a study concluding that the Pacific Northwest, famous for its salmon streams, now has more roads than it does streams. NEW tallied more than half a million miles of public streets, highways, and logging roads in the watershed-defined Pacific Northwest and detailed the damage they cause. Copies of "Roads Take Toll on Salmon, Grizzlies, Taxpayers" are available for \$2 from NEW, 1402 3rd Avenue #1127, Seattle, WA. 98101; <http://www.speakeasy.org/new>.

Marine Predator Restoration

The Biodiversity Legal Foundation (BLF) Marine Conservation Program is underway in response to continuing loss and fragmentation of coastal marine habitat, severe overfishing, and the failure of state and federal governments to protect biological diversity on our public coasts and in marine ecosystems. For information, contact Biodiversity Legal Foundation/Marine Conservation Program, POB 18327, Boulder, CO 80308-1327.

Forest Ecosystem Health

The Citizens' Forest Ecosystem Health Initiative (CFEHI) outlines policies and programs to maintain and restore the health of federal forest lands in the West. The initiative details the role of fire in restoration, other restoration techniques, plans for conserving old growth and reducing roads, and general community management and involvement. The CFEHI is a joint product of the Klamath Forest Alliance and the Northwest Ecosystem Alliance. To request a copy, write KFA, POB 820, Etna, CA 96027.

Bioregional Workbook

Discovering Your Life Place: A First Bioregional Workbook, by Peter Berg, is an educational tool based on Planet Drum workshops to help people realize their relationships with local natural systems. Intended for all ages, it introduces the concepts of bioregionalism, and offers map-making exercises as well as suggesting strategies for living in place sustainably. For information contact Planet Drum Books, POB 31251, San Francisco, CA 94131; 415-285-6556; e-mail: planetdrum@jgc.apc.org.

Pacific Crest Trail Fundraising Trek

Walkin' Jim Stoltz is hiking the 2750-plus-mile Pacific Crest Trail as a fundraiser for the Northwest Ecosystem Alliance, Predator Project, and Southern Utah Wilderness Alliance. Walkin' Jim has walked over 20,000 miles through America's wildlands over the past 22 years. To raise money for the groups, Jim is asking supporters to pledge at least one cent for every mile he walks. Pledge sheets and more information are available by calling Carla Neasel at 406-585-9607.

Report on Fee Hunting as Viable Alternative to Grazing

Forest Guardians recently released a study showing that fee hunting opportunities within the San Pedro Parks Wilderness Area in northern New Mexico could provide an economically viable alternative to commercial livestock production. Conducted by Dr. Brian Roach of the University of California-Davis, the report determined that 41 Elk hunting permits would be needed to provide 25 ranchers with an alternative source of income equal to that generated from cattle production. The report found that in most cases the Elk hunting benefits are more than twice the value of the benefits of commercial livestock production. In addition, the protection of this watershed area from livestock grazing would benefit all who rely on water from San Pedro Parks. The report costs \$10. Contact John Horning 505-988-9126 or Dr. Roach 916-752-6182.

Fifth Annual Deep Ecology Workshop

This year's workshop, sponsored by the Way of the Mountain Center and The Aspen Center for Environmental Studies, will take place August 5-9. It offers the unique experience of living Deep Ecology in the wilds of the rugged Elk Mountains. Three CEUs of academic credit are available. Workshop presenters include Dolores LaChapelle, Max Oelschlaeger, Robert Greenway, Jody Cardamone and Penny Woodward. For more information write Jody Cardamone, Aspen Center for Environmental Studies, POB 8777, Aspen, CO 81612.

Talking Gourds

The Telluride Writer's Guild (in conjunction with the Ah Haa School) will host the annual Talking Gourds Retreat, a

gathering of poets, practitioners, and performing artists from 28-30 June 1996 at The Faraway Ranch on Wilson Mesa. This year's retreat, which will focus on education, includes lectures, workshops, rituals, and performances. It is centered around what Arne Naess termed deep ecology and inspired by the work of Dolores LaChapelle. For information, contact Judy Kohn, Director, 970-728-3886, POB 1590, Telluride, Colorado 81435.

Silphion Project

The Silphion Project is a UK-based group working to conserve the world's medicinal plants. The project involves cultivating specimens of North American plants in Britain to alleviate pressure on the genetic diversity and robustness of the wild populations, and to ensure a more consistent supply and quality of plant material. Brackenhurst College will site the collection and take part in the propagation and maintenance of plants. A database on the habitat, population biology, conservation status and collection in the wild of each species is also being developed. For more information contact Silphion Project, 66 Victoria Gardens, Horsforth, Leeds LS18 4PH England, UK; phone (0113) 258 3194; e-mail herbaid@gn.aps.org.

Mesoamerican Society for Biology and Conservation

The Mesoamerican Society for Biology and Conservation was formed in January 1996 at Lake Yojoa, Honduras by a group of biologists from five countries and numerous branches of the biological sciences. The new society will serve biologists and conservationists throughout Central America and southern Mexico by publishing a news bulletin, *Mesoamericana*, and by sponsoring annual congresses in Mesoamerica. Persons interested in the society are invited to become founding members and subscribe to the bulletin. Institutions are also invited to help found the society. For more information contact Oliver Komar, Zoology Department, Ohio Wesleyan University, Delaware, OH 43015; 614-369-0175; e-mail: ookomar@cc.owu.edu.

Canadian Population Newsletter

One newsletter of interest to environmentalists concerned about escalating human demands on Nature is *SusPop*

News, published in Edmonton, Alberta, Canada. It began in 1991 as the organ of the Sustainable Population Society and has gone on to become the newsletter of an alliance of Canadian population groups, the Canadian Population Action Network. The newsletter monitors population growth in Canada, the fastest growing of all western industrial countries. Its concerns include population growth in countries with high per capita consumption, and the spread of the consumer society to populous countries of the Orient; advocating a quantitative population policy for Canada and a more rational immigration policy; and protection of the rich biomes of southern Canada where population growth is concentrated. Contact SusPop News, Box 11964, Edmonton AB T5J 3L1, Canada, phone/FAX 403-466-2196.

GreenDisk Guide to Environmental Computing

The GreenDisk Paperless Environmental Journal has created an electronic environmental research encyclopedia. In addition to listings for Web Sites, the guide contains online databases, educational programs, and access to past and present articles of the GreenDisk which are keyword searchable for easy application. The guide contains files describing computer resources on such issues as Biodiversity, Population and Consumption, Decline of Global Fisheries, Biotechnology and Genetic Engineering, Endangered Species Act, and more. The guide is available in Macintosh and IBM formats and will run on any computer. It costs \$25; included is a \$30 credit toward the purchase of the back issues databases. A review issue and more information about the GreenDisk are available at URL-ftp://ftp.igc.apc.org/pub/GREEN_DISK/ or e-mail at <greendisk@igc.apc.org> or toll-free 1-800-484-7616, then enter code #3475.

Theater of Restoration

The Theater of Restoration (TOR) promotes the use of theater as a means to develop ecological literacy. The program was developed in a community-based homeschool out of a shared interest in the imaginative spirit, the natural world, and an awareness that living on Earth requires collaboration with nature. TOR workshops

focus on major environmental concerns: migration and the river of birds, salmon of the heart, calling the frogs back. Each week the themes are drawn from naturalist literature, poetry, and visual arts. The performances are crafted through visual media and poetic storytelling. They work with writing, drawing, mask and prop making, and explore ways to combine dialogue, mime, and readers' theater. The performance is presented to the community in an important sanctuary—a place of natural beauty or an area in need of restoration. For information write Nanda Current, Theater of Restoration, 530 Amigo Rd., Soquel, CA 95073.

Deep Ecology Literature

The literature of deep ecology (not to mention conservation biology, environmental policy, Nature writing...) is growing far too rapidly for *Wild Earth* to cover

adequately. Several titles by Canadian philosopher and *Trumpeter* editor Alan Drengson, however, deserve special mention here. *The Deep Ecology Movement: An Introductory Anthology* (North Atlantic Books, 1456 Fourth St. Berkeley, CA 94710), edited by Alan Drengson and Yuichi Inoue, offers a collection of articles exploring the grassroots deep ecology movement cross-culturally. Also noteworthy is Drengson's narrative on creating ecological harmony in daily life *Doc Forest and Blue Mountain Ecostery* (Ecostery House, POB 5885 Stn. B, Victoria, BC, Canada, V8R 6S8; FAX 604-598-9901). Drengson's newest book is *The Practice of Technology: Exploring Technology, Ecophilosophy, and Spiritual Disciplines for Vital Links* (State University of New York Press, State University Plaza, Albany, NY 12246-0001).

Erratum

Sharp-eyed readers noted the spring issue's back cover artwork was either miscaptioned or depicted a decidedly muscle-bound Fisher. The critter in question is, of course, a Wolverine. *WE* regrets the error, and begs forgiveness from *Gulo gulo*, *Martes pennanti*, and artist Martin Ring (whose other illustration in the issue, on page 9, does portray a Fisher).



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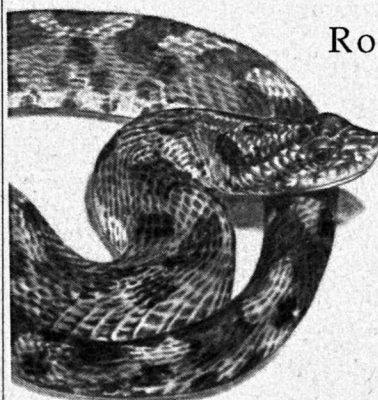
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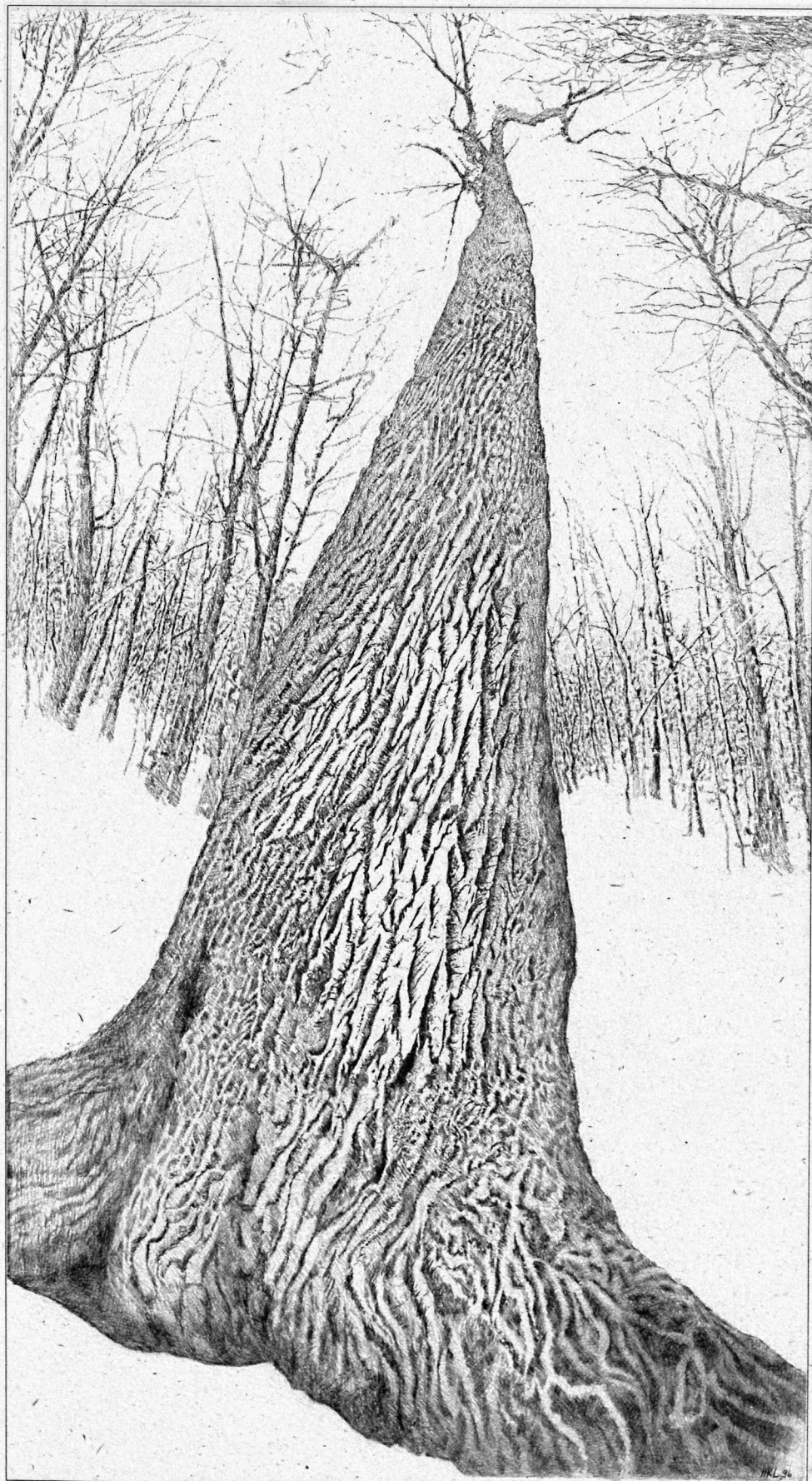
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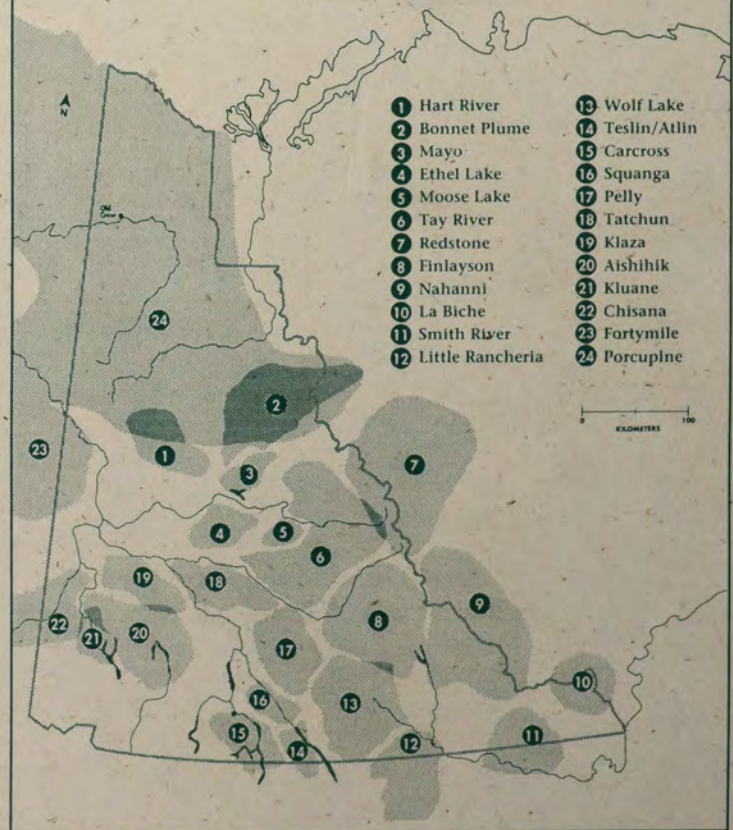
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