Wild EARTH

Fall
1995

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The Black Birch

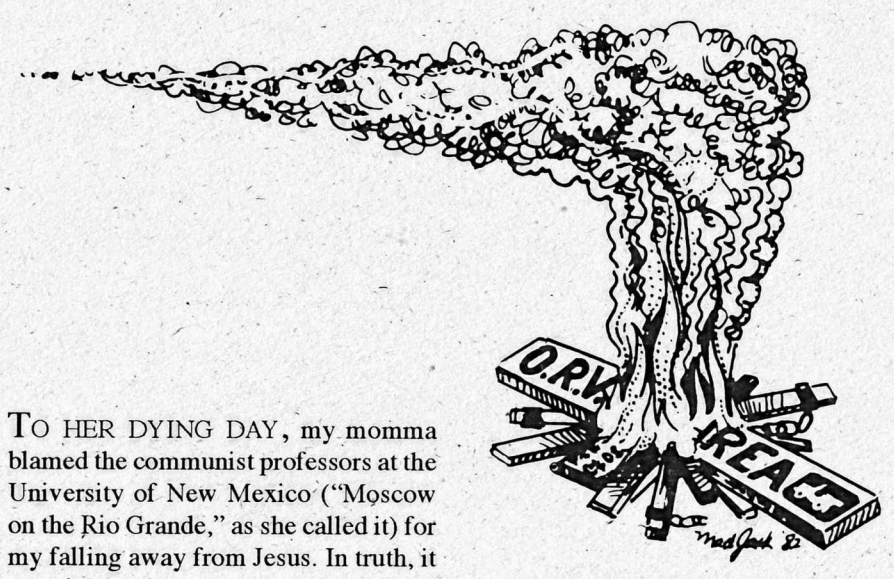
Rick Bass on Round River

Threatened Eastern Old Growth

Conservation and First Nation Relations

Wendell Berry on *Private Property and the Common Wealth*

Around the Campfire



TO HER DYING DAY, my momma blamed the communist professors at the University of New Mexico ("Moscow on the Rio Grande," as she called it) for my falling away from Jesus. In truth, it wasn't Marxists who turned me into an atheist, but their polar opposites: Libertarians. My friends in Young Americans for Freedom were acolytes of Ayn Rand, "faire" queen of the highly individualistic version of atheistic libertarianism called "Objectivism." Being a very young American for freedom at the time, I was swayed by her black-and-white explanation of the world.

Soon, however, I realized that Rand's Objectivism, indeed all Libertarianism, was a religion as much as was fundamentalist Christianity. Instead of the supernatural cant of Jehovah and Jesus, Libertarianism is a religion that worships at the altar of the golden dollar sign. Its holy ghost is the invisible hand of the marketplace. Its golden rule is everyone-for-him-or-herself greed.

Libertarianism bases all on economics. Like other religions, it is wildly hubristic: "We understand the way the world works; here is the revealed truth. It is all you need." It follows a crude Social Darwinism and is based on biological ignorance. No, it's even worse than that. Economic Libertarianism doesn't believe in biology.

This abiologism, I suppose, was what shattered my faith in my new-found religion. In the late 1960s, yes, even before Earth Day, Ayn Rand began to lash out at conservation. Her attack on those trying to protect my wild places caused me to doubt her just as she had caused me to doubt Jesus.

Nonetheless, just as Christianity has some good ideas if you discard the overarching supernatural cant, Libertarianism has some good ideas if you discard the overarching supernatural cant. So, I suppose I became to Libertarianism what a Unitarian is to Christianity: an agnostic who still sees some good ideas in the discarded faith.

What does this personal religious history have to do with conservation? Well, buckaroos, in case you haven't noticed, the American political system has just gone through a massive seizure. Things are different. The music of Yorktown is playing. The world turned upside down.

I don't think this seizure is a temporary freak event in American politics. Much has changed for the foreseeable future. This change will have major effects on conservation politics and particularly on funding for conservation programs. By taking a sympathetic agnostic's whiff of libertarianism, we might change our position in the new Social Darwinian heap.

continued on p. 2

WILD EARTH

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A major challenge for conservationists is to use libertarian ideas to protect biological diversity and wilderness, to defend the public lands, and to control pollution.

A failing of the conservation movement, as I've pointed out before in this column, is our inability to recognize, much less anticipate, trends in American politics and society. The most vigorous political faction in America today is a demented marriage of economic libertarianism and old-testament-style Christianity. Never mind that this marriage of convenience can't possibly last for long—it is virtually running the show now. Economic libertarianism will continue to be the driving force in American politics for some time.

With the jihad to balance the federal budget and the storming of the Bastille of federal regulations, the traditional exploiters of the public lands will seek every opportunity to kneecap conservation. Federal money will become ever tighter for land managing agencies—especially for their conservation programs. Some National Parks are shutting down. Funding for the Endangered Species Act has been slashed. A new generation of Sagebrush Rebels proposes to sell off public lands and federal mineral estates to balance the budget. It is a raid on the commonwealth to make dear old Albert Bacon Fall grin in his grave.

A major challenge for conservationists is to use libertarian ideas to protect biological diversity and wilderness, to defend the public lands, and to control pollution. Although libertarian arguments have been primarily used to oppose conservation, I think properly-applied libertarianism can strengthen conservation. Mind you, I'm *not* proposing changes in our basic principles, policies, or arguments. I am suggesting some *possible* new approaches as a strategy to deal with the hostile political whirlpool around us.

In recent Campfires, I've given some general guidelines for responding to the new political reality. Here I'd like to expand on one piece of what I've been talking about. The guiding light I propose for blending conservation and libertarianism is:

USER PAYS

This basic concept has long been used for hunting and fishing. Because hunters and fishers are willing to pay for licenses, there has been money to purchase wildlife habitat, operate hatcheries, fund state game and fish agencies, and so on. The hook and bullet crowd has been able to claim the boasting ground. "We pay for our outdoor recreation. The reason we have wildlife is because of hunting and fishing license fees." Despite the emphasis on weed species like White-tailed Deer, exotics like pheasants, and planting non-native fish, the good ol' boys have a legitimate point. It is time for hikers, bird watchers, river runners, backpackers, and those who just like the idea of wilderness and wolves to learn from our sporting brothers and sisters. If we want National Parks properly operated, if we want endangered species protected, if we want places to hike without dirt bikes and clearcuts and cowpies, we may need to pay for it. We also need to look long and hard at unnecessary costs and work to eliminate them. We need to listen to Randal O'Toole more.

The Golden Eagle permit sells for $25. It gives you unlimited, free access to all National Parks, Wildlife Refuges, and many other public facilities for a year. It is the biggest bargain in America. We should propose that it be increased to $100 a year. All money from it should go to the National Park Service and US Fish & Wildlife Service for national conservation programs. Entrance fees for individual National Parks and Refuges should be increased so that the fees are enough to fund management of the particular unit. Entrance fees should remain with the Park or Refuge. Senior citizens now get a considerable discount on Golden Eagle and specific entrance fees. This is unfair since senior citizens generally have more disposable income than other groups. Senior discounts should be eliminated. Campground fees should be high enough to cover all costs of building and operating the campground, including personnel costs. (Now, don't come running with guilty-liberal sniffing about how higher fees will discriminate against lower-income Americans. Some kind of discount could be worked in for the truly poor—but not for the "voluntary poor.")

I have found wild rivers, formally designated or not, to be the best managed public lands for primitive recreation and for biodiversity. Most wilderness rivers I float charge per person and sometimes per day. River rangers inspect equipment, check permits, and give etiquette and safety lectures at the put-in. River campsites are cleaner and less hammered than campsites in Wilderness Areas. These are some of the benefits of user fees. River use fees should even be increased to insure adequate presence of river rangers and to fund ecological restoration and cleanup.

Wilderness Areas should charge for recreational use on the wild river model—for each entry. Or Wilderness use could be handled on a Golden Eagle or hunting license model—buy your pass and you can enter any Wilderness Area in the country for one year. All entrance fees should go toward wilderness rangers, administering recreational use, and ecological restoration.

There should be a national sales tax on backpacking and river running equipment. Money collected should be used to acquire private inholdings in Wilderness Areas and along Wild Rivers. It should also be used to buy out grazing permittees in Wilderness Areas, National Parks, Wildlife Refuges, and other reserves. I've become convinced that butting-head battles with ranchers over grazing in Wilderness is bad news for all in-

volved. The most practical (and, I gotta admit, fair) way to end grazing in Wilderness is to buy 'em out. (As an aside, conservationists need to rally around the Land and Water Conservation Fund.)

There should also be a national sales tax on birdseed, binoculars, and other wildlife observation equipment. Money collected should go to fund Endangered Species programs. Some money from entry fees for Wildlife Refuges should also go for ESA costs.

Concessionaires in National Parks are getting a free ride on the NPS's shoulders. Fees for all commercial operations in National Parks and for outfitters operating on public lands should be increased. Where allowed, the use of private automobiles in National Parks should carry an additional fee (because auto-based recreation is more expensive for the Park). Campground fees for RV users should be higher than those for tent campers.

Another positive user-pays approach is the Defenders of Wildlife compensation fund for those who lose livestock to predation from reintroduced wolves or from Grizzly Bears. Defenders also rewards landowners who are honored with wolves denning and raising young on their lands. This is fair and encourages good public relations.

A libertarian approach can also be taken for landowners who build in natural fire habitats, flood plains, hurricane zones, and the like. The US should pay no compensation for natural catastrophes. If people are foolish enough to build in dangerous places, they—who enjoy the benefits of living in such places—and not the public should bear the risk. Too often Americans have a two-year-old's version of libertarianism—extreme self-centeredness with no sense of responsibility. They want to be free and have the government off their backs, but come disaster they want to be taken care of. This is similar to the libertarian assholes who whine and whimper about mandatory helmet laws for motorcyclists. They want the freedom to ride with the wind blowing through their locks. Fine. If they want to be fools, they have every right to be fools. But when they end up in wheelchairs, my tax dollars should not take care of them for the rest of their lives.

I realize there are good arguments against all I have proposed. True, if you have to pay to use Wilderness Areas, it takes away the sense of pioneer freedom to freely explore the land. But we are no longer a nation of few people and much wild land. Times have changed. Far more important than our recreational fantasies of the unlimited right to roam is the need to keep the land public and to keep it ecologically intact. By demanding the privilege to pay for wilderness and wildlife, we elevate ourselves in the debate. We are responsible.

There is also the problem that if the agencies are funded through recreational income, they will overdevelop Parks and Wilderness for recreation at the expense of biodiversity. Although this has not occurred with river fees (the numbers of permits are strictly controlled to limit overuse), some safeguards will have to be built in to prevent this problem.

Another problem is getting recreationists to be willing to pay their fair share. A solution would be to get the Conservation Alliance (a foundation of outdoor equipment manufacturers and retailers) to propose the tax on outdoor equipment, to get the Sierra Club (a conservation group of outdoor recreationists) to propose Wilderness Area user fees, to get the National Audubon Society (a conservation group of bird watchers) to propose the tax on birdseed and binoculars, and to get a group of conservation-minded outfitters and concessionaires to propose an increase in commercial use fees, and so on.

Unless we take more of a user-pays approach to public lands and wildlife, we will see a steady decline in funding for land management agencies and the Endangered Species Act. The first round of draconian cuts has already happened. It will get worse. Given this political climate, the only way to insure adequate funding for conservation is for users to pay more and then earmark that money for conservation and public lands management. A user-pays approach will also undercut some powerful arguments against conservation programs. And finally, I guess I am still enough of a libertarian to believe that user-pays is an ethical approach. When conservationists cry about funding cuts for National Parks, we stumble into the morass of the victim, of the irresponsible citizens who want their entitlement handouts. Instead of whining about the end of social welfare, we conservationists can take the lead in the debate about a new world of limits. Happy Trails.

—Dave Foreman, Gila Wilderness

Moonlight *by Douglas Moore*

The Wildlands Project Update

July 1995

Wendell Berry recently wrote that "(p)roperly speaking, global thinking is not possible. Those who have 'thought globally' (and among them the most successful have been imperial governments and multinational corporations) have done so by means of simplification too extreme and oppressive to merit the name of thought." [Wendell Berry: *Sex, Economy, Freedom & Community*, New York: Pantheon, 1993] Such global thinking is symptomatic of the loss of place Berry has rightly identified as contributing to the destruction of life on Earth.

If we can't truly think globally and still be anchored, we can at least be concerned with the globe, recognizing the interconnections among its many regions. And certainly we can and should link region-based work across North America to create and implement the vision of wilderness recovery.

Beyond North America, The Wildlands Project has always hoped to inspire similar efforts on other continents and adjoining oceans. In the last several months something more impressive than inspiration has been at work: parallel and convergent evolution in approaches to conservation.

Throughout the former Soviet Union (FSU) world class biologists and ecologists, along with newly emerging grassroots organizations, have been struggling to protect or restore landscapes. They are working to identify and link large cores based on the needs of wide-ranging species and ecosystem functions.

Wildlands staff were invited to a May meeting in Kiev, Ukraine to discuss cooperation with FSU counterparts. As a result of that meeting TWP will facilitate communication between groups in the FSU and North America, largely through journal subscriptions and referrals from the database. Even less well-funded than North American groups, FSU conservationists are working to protect Siberian Tigers and the Taiga in the east, wolves in Georgia, and wetlands in the west. We also hope to cooperate on protection of the arctic and oceanic life in the north Pacific.

More recently a group called EECONET organized a meeting in Lisbon to discuss recovery in Europe of large, linked natural areas. At the same time a meeting was under way near Rome (organized by World Wildlife Fund) to develop a strategy for large carnivore protection and restoration in Europe. The last refugia of bears and wolves are under assault by pollution and raging development.

It is no accident broad-based efforts similar to the North American Wilderness Recovery Strategy have emerged elsewhere. Wherever people love the wild, the best science points in the same direction: We must describe and implement protection for vast networks of land and water.

Global discussions have not distracted us from our main work, which is the creation of such a network throughout North America. Project staff have been working on a handbook for regional reserve design to be distributed toward the end of summer. Some of the materials will be in a second special issue of *Wild Earth* devoted to the project (now scheduled for publication in Winter 1995/6). The handbook will include:

by David Johns

- guidelines on developing a regional conservation strategy, including criteria for designating core areas and corridors;
- general information and case studies on ecosystem representation;
- guidelines and case studies on key species selection and determining ranges;
- directions for mapping marine ecosystems and species;
- methods for integrating activists in scientific work and examples of how it has been done;
- strategies for acquiring and using information, including how to make highly technical information available to a larger audience and ground-truthing;
- suggestions on preparing material for peer review;
- ideas on community involvement in the process of wildlands protection, including a list of community relations consultants;
- a list if people undertaking economic analysis of the impact of wildlands protection;
- strategies for private lands protection;
- examples of reserve design work at various stages of completion.

Not all materials will be ready in late summer, but the handbook will be looseleaf so contents can be easily updated. The items included are the things you have been requesting. When we distribute the handbooks Rod, Jim and I will go over them with you to try to ensure they meet your needs and get ideas for improvements.

In looking at the contents it's clear that on-the-job training is central to what we're doing. That further points to the need for completing reserve design pilots: initially emphasizing work in areas where we can complete it sooner rather than later, then making the lessons learned available to others.

Some of you have expressed concern over threats to regions not receiving a high priority. The prioritization did not reflect the biological value of areas or the immediacy of threats, but rather the ability of groups in those areas to complete reserve design. The list is flexible, and all regions will receive support.

During the last few monthes we have been working on a proposal to undertake a rapid ecological assessment of the US and Mexico. The process involves standardizing ecosystem typology, mapping all ecosystem types, and a quick gap analysis to determine what is and is not protected. When completed, this assessment will allow us to integrate ecosystem information on the US and Mexico with that of Canada and Mesoamerica. In the latter two areas the preliminary ecosystem mapping has been completed. The information will be made available to cooperating groups.

This work does not duplicate the US National Biological Service's Gap Analysis Project, which is a much lengthier and more detailed process. NBS gap analysis information will not be available for most US states for some years to come.

The project is working with potential funders to encourage their cooperation in providing enough support for each region to get reserve design work completed. Demonstrating the value of reserve design work by successfully completing pilots will attract more funding. Groups interested in working on joint funding proposals should contact the Oregon office.

A series of fundraising events will be organized by Patagonia in their stores throughout the US this fall. Contact your local Patagonia store in Santa Barbara/Ventura, San Francisco, Seattle, Salt Lake City, Denver, Dillon, Freeport, Boston, New York City and Washington, D.C. for details. The events will benefit both The Wildlands Project and cooperating regional groups.

A poster is being designed to bring The Wildlands Project message to a larger public. The Wildlands Project slideshow will be taped this August. We will also video-tape the slideshow.

On April 3 PBS broadcast a "Web of Life" documentary on biodiversity that featured The Wildlands Project. Reaction has been very positive. Copies of the video are available from WQED, 4802 5th Ave., Pittsburgh, PA 15213.

World Wildlife Fund-Canada has just published Paul Paquet and Arlin Hackman's *Large Carnivore Conservation in the Rocky Mountains*. Order from WWF-Canada, 90 Eglington Avenue E., Suite 504, Toronto, ONT M4P 2Z7. The price is $5 (Can.).

You've heard it from me before, but let me say it again: Without you there is no *Wild Earth*, no Wildlands Project, and little hope for the wild things. Thanks to all the cooperating groups and visionary funders.

The Wildlands Project welcomes new board members Libby Ellis (California), Steve Gatewood (Florida), Donna House (New Mexico), Brian Miller (Jalisco), Juri Peepre (Yukon), and Louisa Willcox (Montana). They bring with them not only long-standing commitments to wildness, but a multitude of talents. Libby Ellis brings management, public relations, and fundraising skills to the board. Steve Gatewood has long experience in protecting Southeast US ecosystems. Donna House has long experience working with indigenous peoples to protect and restore the US Southwest. Brian Miller has done work ranging from prairie dog conservation in the US to Mountain Lion work in and around the Cuixmala reserve along the SW Mexican coast. Juri Peepre has forged a broad coalition in Yukon Territory in support of a vast wildlands network that can protect Caribou herds and the boreal forest. Louisa Willcox has been working to make the dream of a whole Yellowstone real, and brings extensive organizing skills to the Project. John Davis, editor of *Wild Earth* was re-elected to the board, as was Michael Soulé, founder of the Society for Conservation Biology and mentor to some of the finest ecologists working today.

Private Property and the Common Wealth

by Wendell Berry

This essay owes its existence to anxiety. I write, as I must, from the point of view of a country person, a member of a small rural community that has been dwindling, perhaps for most of this century and rapidly since the end of World War II. Only the most fantastical optimism could ignore the possibility that my community is doomed—that it was doomed by the overwhelming victory of industrialism over agrarianism (both North and South) in the Civil War and the history both subsequent and consequent to it. It may be that my community—its economy, its faith, its local knowledge, its affection for itself and its place—will dwindle on for another generation or two and then disappear or be replaced by a commuters' suburb. If it is doomed, then I have no doubt that much else is doomed also, for I cannot see how a nation, a society, or a civilization can live while its communities die.

If that were all my thought, then I might find some comfort in despair. I might resign myself and at least sleep better. But I am convinced that the death of my community is not necessary and not inevitable. I believe that such remnant communities as my own, fallen to the ground as they are, might still become the seeds of a better civilization than we now have—better economy, better faith, better knowledge and affection. That is what keeps me awake, that difficult hope.

My hope, I must say, subsists on an extremely meager diet—a reducer's diet. It takes some strength from the knowledge that we may be looking doom squarely in the face, from the knowledge that human beings, let alone human societies, cannot live indefinitely by poison and fire. It takes some strength from knowing that more and more people seem to have this knowledge; more and more people seem to know that we now have to choose consciously, perhaps for the first time in human history, between doom and something better.

My hope feeds, however uneasily, on such a phrase as "the forest commons" that has recently floated up into public discussion. I think I know the worry and the hope from which that phrase comes. It comes from a growing awareness of the mutuality of the health of human beings and the health of nature, and this is encouraging. I am uneasy about it because I think I know also what the word "commons" means. It means a property belonging to a com-

An earlier version of this essay was delivered as a speech at a conference on "The Forest Commons" at Eastern Kentucky University, Richmond, Kentucky, 31 March 1995. It will appear in a new collection of Wendell Berry's essays, *Another Turn of the Crank*, to be published by COUNTERPOINT (1627 I Street NW, Suite 850, Washington, DC 20006) in October 1995.

illustrations by Evan Cantor

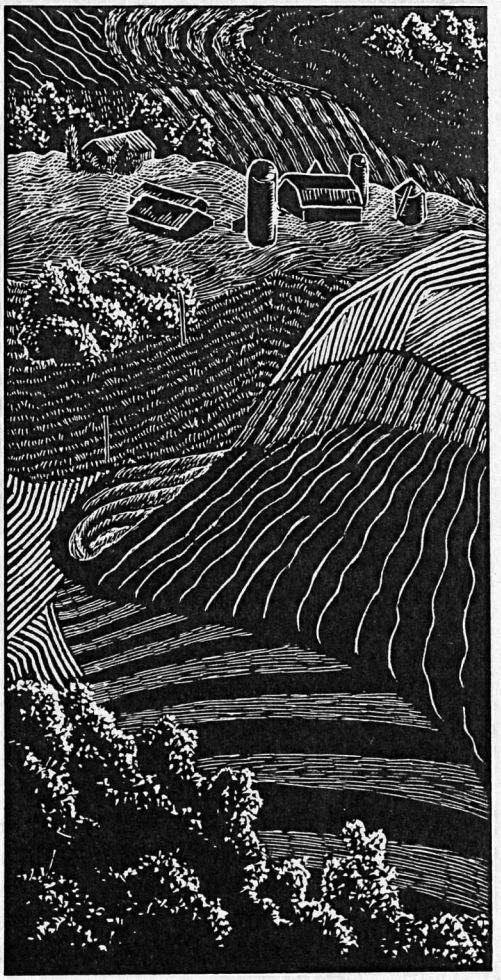
munity, which the community members are free to use because they will use it with culturally prescribed care and restraint. I do not think that this even remotely applies to us.

Historically, the commons belonged to the *local* community, not to "the public." The possibility of a commons, in the true sense, depends on local adaptation, a process in which Americans have, at times and in places, made a few credible beginnings, always frustrated by the still-dominant belief that local adaptation does not matter because localities do not matter. At present it is generally true that we do not know in any useful sense where we are, much less how to act on the basis of such knowledge. If we humans know where we are and how to live well and conservingly there, then we can have and use the place "in common." Otherwise—and it is still far otherwise with us—we must find appropriate ways to parcel out, and so limit, both privilege and responsibility.

The idea of a commons applies perhaps to most tribal cultures. It applied to English culture before the long and bitter history of enclosure. It applied, for a while, in New England. But we in Kentucky, as in most of the rest of the United States, never had such an idea. We have had the idea of private property, the idea of public property, and the idea of the commonwealth—and we have valued those ideas in about that order. We have never thought very well or very thoroughly about any of those ideas. Nevertheless, I prefer the word "commonwealth" (in its literal and now somewhat outdated sense) to the word "commons," for the very reason that "commonwealth" comes to us with so great a historical burden. We have been saying it and ignoring it for so long that though it accurately names our condition and our hope, it is not likely to lead to too much optimism. Too much optimism, I am afraid, will lead us to understand by "commons" only what we have so far understood by "public"—and that clearly would solve none of our problems.

In my own politics and economics I am a Jeffersonian—or, I might more accurately say, I am a democrat and an agrarian. I believe that land that is to be used should be divided into small parcels among a lot of small owners; I believe therefore in the right of private property. I believe that given our history and tradition, a large population of small property holders offers the best available chance for local cultural adaptation and good stewardship of the land—provided that the property holders are secure, legally and economically, in their properties.

To say that the right of private property has often been used to protect individuals and even global corporations in their greed is not to say that it cannot secure individuals in an appropriate economic share in their country and in a consequent economic and political independence, just as Thomas Jefferson thought it could. That is the political justification of the right of private property. There is also, I believe, an ecological justification. If landed properties are democratically divided and properly scaled, and if family security in these properties can be preserved over a number of generations, then we will greatly increase the possibility of authentic cultural adaptation to local homelands. Not only will we make more apparent to successive generations the necessary identity between the health of human



I believe that such remnant communities as my own, fallen to the ground as they are, might still become the seeds of a better civilization than we now have—better economy, better faith, better knowledge and affection. That is what keeps me awake, that difficult hope.

communities and the health of local ecosystems, but we will also give people the best motives for caretaking and we will call into service the necessary local intelligence and imagination. Such an arrangement would give us the fullest possible assurance that our forests and farmlands would be used by people who know them best and care the most about them.

My interest here is in preserving the possibility of intimacy in the use of the land. Some of us still understand the elaborate care necessary to preserve marital and familial and social intimacy, but I am arguing also for the necessity of preserving silvicultural and agricultural intimacy. The possibility of intimacy between worker and place is virtually identical with the possibility of good work. True intimacy in work, as in love, means lifelong commitment; it means knowing what you are doing. The industrial consumer and the industrial producer believe that after any encounter between people or between people and the world there will be no consequences. The consumptive society is interested in sterile or inconsequential intimacy, which is a fantasy. But suppose, on the contrary, that we try to serve the cultural forms and imperatives that prepare adequately for the convergence of need with fertility, of human life with the natural world. *Then* we must think of consequences; we must think of the children.

I am an uneasy believer in the right of private property because I am aware that this right can be understood as the right to destroy property, which is to say the natural or the given world. I do not believe that such a right exists, even though its presumed existence has covered the destruction of a lot of land. A considerable amount of this destruction has been allowed by our granting to corporations the status of "persons" capable of holding "private property." Most corporate abuse or destruction of land must be classified, I think, as either willing or intentional. The willingness to use land on a large scale implies inevitably at least a willingness to damage it. But because we have had, alongside our history of land abuse, a tradition or at least a persistent hope of agrarian economy and settled community life, the damage to the land that has been done by individual owners is more likely to be attributable to ignorance or to economic constraint. To speak sensibly of property and of the rights and uses of property, we must always observe this fundamental distinction between corporate property and property that is truly private—that is, property of modest or appropriate size owned by an individual.

Our history, obviously, gives us no hope that in our present lack of a general culture of land stewardship, the weaknesses in our idea of private property can be corrected by the idea of public property.

There is some hope, I think, in the idea of the commonwealth, which seems to acknowledge that we all have a common interest or share in the land, an interest that precedes our interest in private property. The best evidence of this precedence of our share in the common wealth is that we share also a common health; the two, in fact, are inseparable. If we have the "right to life," as we have always supposed, then that right must stand upon the further right to air, water, food, clothing, and shelter.

It follows that every person exercising the right to hold private property has an obligation to secure to the rest of us the right to live from that property. He or she has an obligation to use it in such a way as not to impair or diminish our rightful interest in it.

But—and here is the catch—that obligation on the part of the landowner implies a concurrent obligation on the part of society as a whole. If we give our proxy to the landowner to use—and, as is always implied, to take care of—the land on our behalf, then we are obligated to make the landowner able to afford not only to use the land, but to care properly for it. This is where the grossest error of our civilization shows itself.

illustration by Evan Cantor

In giving a few farmers our proxies to produce food in the public behalf for very little economic return, we have also given them our proxies to care for the land in the public behalf for no economic return at all. This is our so-called cheap-food policy, which is in fact an antifarming policy, an antifarmer policy, and an antiland policy. We have also a cheap-timber policy, which is similarly calamitous.

We hold the land under a doctrine of private property that in practice acknowledges no commonwealth. By allowing or forcing the owners and users of productive land to share in the commonwealth so minimally that they are poorly paid for their work and not paid at all for their stewardship, we have stood an ancient pyramid on its tip. We now have an enormous population of urban consumers dependent on a tiny population of rural producers. And this involves a number of problems that are not merely quantitative or practical.

In her paper, "Agricultural Industrialization and the Loss of Biodiversity," my friend Laura Jackson helps us to see that as farming families dwindle away, we lose not just essential and perhaps irreplaceable knowledge but also an old appreciation and affection that may be even more valuable. Here is what she says about the industrialization of livestock production; though she is talking about agriculture, her principle applies just as obviously to forestry:

While innovative farmers can still raise hogs and dairy cattle more cheaply and with fewer environmental impacts than the high-density livestock facility, they suffer as their neighbors go out of business and the infrastructure and markets for livestock crumble....Without a market to sell their animals, even the most practical, conscientious, and sustainable operations, including those of the Amish and Mennonites, are in danger of disappearing. When the minds responsible for these farms have left the countryside, replaced by minimum-wage labor in factory-style facilities, so will the potential to conserve and improve the agricultural landscape.

Conservationists have now begun to acknowledge that the health and productivity of the land constitute a commonwealth. I say they have *begun* to acknowledge this because at present they tend to acknowledge it only so far as it pertains to forested or otherwise "wild" land, the land that most conservationists understand as "natural." They wish to protect the common wealth of the forested land by some such doctrine as "the forest commons." But the danger is that this will accomplish only one more anomalous inversion; from a doctrine of private landownership that acknowledges no commonwealth, we might go to a doctrine of commonwealth in which there are no private shares. "The forest commons," I am afraid, may become an idea that will separate forestry and forest conservation from the rural economy, just as industrial agricultural is an idea that has separated farming and soil conservation from the rural economy.

To insist that our public forests should be cared for and used as a commonwealth already strains belief for it raises immediately the question of where we are to find the people who know how and are adequately motivated to care for it. Our history—which is the history of a colonial economy—has not produced, because it could not produce, an adequate number of people adequately prepared to be good stewards of the public lands any more than of lands "privately" owned. Colonial economies place no value on stewardship, and do not teach, encourage, reward, or even protect it.

To remedy this failure, we will have to realize that not just forest land but *all* land, private and public, farmed or forested, is "natural." All land is natural and all nature is a common wealth. Wherever we live, we live in nature and by using nature, and this use everywhere implies the requirement of good stewardship. But we will have to do more than merely change our minds. We will have to implement a different kind of education and a different kind of economy.

If in order to protect our forest land we designate it a commons or commonwealth separate from private ownership, then who will care for it? The absentee timber companies who see no reason to care about local consequences? The same government agencies and agents who are failing to take good care of our public forests? Is it credible that people inadequately skilled and inadequately motivated to care well for the land can be *made* to care well for it by public insistence that they do so?

The answer is obvious: you cannot get good care in the use of the land by demanding it from public officials. That you have the legal right to demand it does not at all improve the case. If one out of every two of us should become a public official, we would be no nearer to good land stewardship than we are now. The idea that a displaced people might take appropriate care of places is merely absurd; there is no sense in it and no hope. Our present ideas of conservation and of public stewardship are not enough. Duty is not enough. Sentiment is not enough. No mere law, divine or human, could conceivably be enough to protect the land while we are using it.

If we want the land to be cared for, then we must have people living on and from the land who are able and willing to care for it. If—as the idea of common-

wealth clearly implies—landowners and land users are accountable to their fellow citizens for their work, their products, and their stewardship, then these landowners and land users must be granted an equitable membership in the economy.

○

Thirty years ago, one of the organizations leading the fight against strip mining was the Appalachian Group to Save the Land and the People. This seemed an exemplary organization—an informed local response to a local calamity—and I was strongly affected and influenced by it. What most impressed me was the complexity of purpose announced in its name: it proposed to save the land *and* the people. This seems to me still an inescapable necessity. You really cannot specialize the work of conservation. You cannot save the land apart from the people or the people apart from the land. To save either, you must save both—that is a lesson taught nowhere better than in the economic history of the Commonwealth of Kentucky. To save both the land and the people, you need a strong rural economy. In truth, you need several strong rural economies, for even so small a state as ours has many regions, and a good economy joins local people conservingly to their local landscapes.

Perhaps the public will prove equal to the task of wilderness preservation, though that is by no means certain. But it is not easy to imagine the conditions under which highly competent and responsible public stewardship of land that is in use might be maintained for many generations and through the inevitable changes of politics and economics.

If we are serious about conservation, then we are going to have to quit thinking of our work as a sequence of specialized and temporary responses to a sequence of specialized and temporary emergencies. We will have to realize finally that our work is economic. We are going to have to come up with competent, practical, at-home answers to the humblest human questions: How should we live? How should we keep house? How should we provide ourselves with food, clothing, shelter, heat, light, learning, amusement, rest? How, in short, ought we to use the world?

No conservation issue could lead more directly to those questions than the issue of Kentucky forestry. It is true that our state contains some sizable areas of private or public forest land, but we cannot proceed on the assumption that we are dealing with large tracts of timber or that we can ever hope to conserve our forests solely by forest conservation policies, however enlightened.

In Kentucky we have 12,700,000 acres of forest, more than 90% of which is privately owned. We must assume, I think, that many of the 440,000 owners of this land would fiercely oppose any public appropriation of their modest properties or any diminution of their rights therein. Although I know very well the dangers to the common wealth and health inherent in private property rights, I would be one of those fierce opposers.

The first of my reasons is my too little faith in the long-term efficacy of public stewardship. Perhaps the public will prove equal to the task of wilderness preservation, though that is by no means certain. But it is not easy to imagine the conditions under which highly competent and responsible public stewardship of land that is in use might be maintained for many generations and through the inevitable changes of politics and economics.

My second reason is that I do have some faith in the long-term efficacy of private stewardship, again provided that the connection between the people and the land can be made secure. To be preserved in use, even our public lands must come to be intimately connected to their local communities by means of strong local economies.

The two great ruiners of privately owned land, as I have said, are ignorance and economic constraint. And these tend to be related. People have ruined land mainly by overusing it—by forcing it to produce beyond its power to recover or by forcing it to produce what it never should have been asked to produce. And behind this overuse, almost always, has been economic need. Sometimes ignorance and poverty have been directly related: the land would have produced better immediately had it been better used. But economic constraint also preserves ignorance in land use: families have often failed or starved out before they had time to learn to use the land well. Land that passes rapidly from one owner or user to another will not be adequately studied or learned and so will almost predictably be abused. The more marginal or difficult the land, the worse will be the abuse.

This work of ignorance and economic constraint, moreover, has been abetted by our time's radical and artificial separation of the producer's interest in the land from the interest of the consumer. In reality, these two interests are the same, and yet our idea of "the market" has encouraged us to think of the interests of producer and consumer as two interests, not only divided but competitive. And we have allowed many economic enterprises and many agencies to interpose themselves between producers and con-

sumers, greatly increasing our bewilderment about our economy, our connection to the land and to one another, and our ecological and economic responsibilities. One result, to name only the most prominent, is our so-called cheap-food policy, by which farmers are put under pressure to abuse the land on behalf of urban consumers, many of whom think of themselves as conservationists.

In Kentucky, we are now moving rapidly toward the end of such economic fantasy. Conservationists wishing to establish good forestry practices in our state will immediately see the hopelessness of conventional economics and of conventional conservation if only they will consider that many of the owners of Kentucky's forests are farmers, and therefore that one of the greatest threats to our forests is the continuing stress within our agricultural economy. We would-be conservers of the state's forests must see that the interests of producers and consumers, of landowners and conservationists, are not divided but only the two sides of a mutuality of interest that waits to be defined. Conservation clearly cannot advance much farther here unless conservationists can make common cause with small landowners and land users. And our state's small farmers and other small landowners desperately need the understanding and help of conservationists.

I would beg my fellow conservationists, as I would beg my fellow farmers, to realize that we must quit thinking of our countryside piecemeal, in terms of separate products or enterprises: tobacco, timber, livestock, vegetables, feed grains, recreation, and so on. We must begin to think of the human use of each of our regions or localities as one economy, both rural and urban, involving all the local products. We must learn to see such local economies as the best and perhaps the only means we have of preserving that system of ecological and cultural connections that is, inescapably, our commonwealth.

If conservationists are serious about conservation, they will have to realize that the best conserver of land in use will always be the small owner or operator, farmer or forester or both, who lives within a securely placed family and community, who knows how to use the land in the best way, and who can afford to do so. Conservationists who are also farmers or foresters already feel the tension between the demands of ecology and the demands of our present economy; they already feel the urgency of our need for a better economy and better work.

Now consumer-conservationists must begin to feel these strains and stresses also. They will have to acquaint themselves with the requirements of good agriculture. They will have to see that a good food economy does not enrich the agribusiness and grocery corporations at the expense of everything and everybody else but pays to the real producers the real costs of good food production in capital, labor, skill, and care. They will have to become active and knowledgeable participants in their local food economies. They will have to see that their local Sierra Club chapter is no more important to conservation than their local food-marketing co-op.

Similarly, they will have to understand the value of and give their support and patronage to the formation of good local forest economics, permanently in place, scaled so as to use the local forests in the best way, and able to pay a price for timber that will encourage the best forestry and logging practices. These three issues of local economy, scale, and price will determine the quality of use. Our present economy pretty well dictates that a farmer's woodlot or forested hillside will be roughly logged once in a generation or once in a lifetime, and otherwise ignored or used for grazing. A good local forest economy would both protect the forest from abuse and make it a continuing source of income to the landowner and the local community.

Let me give just one very suggestive example of what I mean. My friend Gene Logsdon owns fourteen acres of woodland in Ohio, and his son, Jerry, has a small woodworking shop. One of Gene's main reasons for owning his wooded acreage is that he likes trees. He likes to walk in his woods and look at the wildflowers or watch warblers in the spring. His two woodlots would, in a fundamental way, be valueless or even repugnant to him as fourteen acres of stumps. At the same time, a part of his fascination with his small farm, including his woodlots, is in his economic relation to it. He uses his land because using it makes economic sense and gives pleasure. He logs his woodlands very selectively for firewood and lumber, taking mostly dead or dying or defective trees—and always leaving some dead trees in hospitality to the birds and other animals. Every few years he accumulates enough logs for a day's sawing, and then he hires a man with a

illustration by Evan Cantor

portable band saw to come and saw the logs into boards. Here is what he wrote to me in response to something I had written about local forest economies:

You could have made the point in your essay that not only do woodlot owners lack bargaining power but when the wood comes back to the local lumberyard the price is atrocious. Jerry tells me that the last time we had the band saw man in to saw logs, we came away from a day's work with something like 3000 board feet of good white oak lumber, worth $3,000 or $4,000 and this was all from blemished or poor-grade logs that we could not have sold at all to a timber buyer. The band sawyer charged us $350! Not only that, but we got a few board feet of mulberry, pear, and sassafras for furniture accents. The mulberry and pear were big old yard trees that a regular sawmill would never take because of possible hardware in the log. A band sawyer can take the risk of hitting a nail because a dulled band-saw blade can be sharpened for $15.

This is an excellent example of intimacy in land use. This is the way a good forest economy reaches the ground. Such intimacy enables pleasure, good care, attention to details, awareness of small opportunities, diversity, and thrift. It prevents abuse, preserves the forest, and produces an economic return. A fourteen-acre woodland that supplies a household's winter heat and $1,000 worth of sawed lumber a year is contributing significant income—considerably more, in fact, than an equal acreage of corn. We should note in passing that Gene's woodlands have produced this income probably without diminishment of their value as standing timber. Moreover, as he well knows, such farm woodlands might also produce fence posts, medicinal or edible herbs, Christmas wreaths, mushrooms, and other products usable or marketable. We must also understand that this sort of forestry and forest economics cannot expectably or even imaginably be practiced by a public agency or a timber company.

But let us not limit our thinking just to the economics of woodlands. Let us think of the thousands of farm woodlands in Kentucky not just as the possible basis of a system of good regional forest economics but as parts of family farms that include, in addition to their woodlands, some land that is arable and some that is in permanent pasture. Such farms in Kentucky are capable of producing an astonishing variety of marketable products: forest products, livestock, row crops, herbs and mushrooms, fruits and vegetables. They can produce these good and necessary things in great abundance indefinitely, protecting in the process the commonwealth of air, water, forests, and soils, granted only the one condition: vigorous local economies capable of sustaining a stable and capable rural population, rewarding them appropriately both for their products and their stewardship. The development of such economies ought to be the primary aim of our conservation effort. Such development is not only desirable; it is increasingly necessary and increasingly urgent.

Wendell Berry is a farmer and writer in central Kentucky. His books of essays include The Unsettling of America, The Gift of Good Land, Home Economics, *and* What Are People For? *His latest books are* Watch With Me *(fiction) and* Entries *(poetry).*

Crossover Peak

How to take home this place,
where the lean of the tree
bears a memory of wind
and lichens perform
a slow devouring of boulders...
to lie down in a bosom of roots,
cold,
and hear the cold cricket heartbeat
of drowsy woods
is to know: futility of possession.

Take back nothing
but a craving for air the aspens breathe.

—Suzanne Freeman

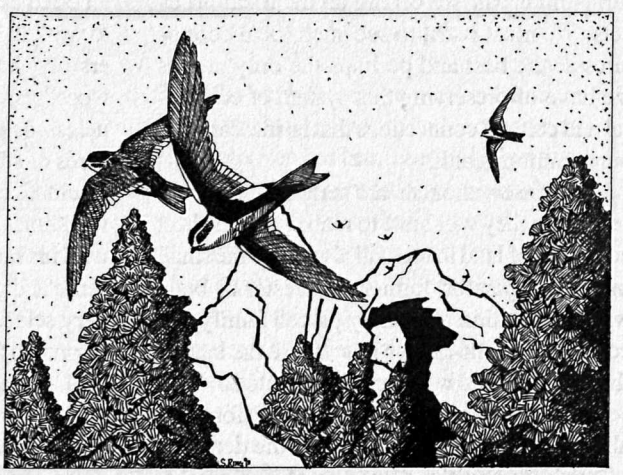


illustration by Sue Ring

Not Cows or Condos

I am writing to express concern over what I see as a potential stumbling block in the growing movement toward community based conservation. I fear we (the conservation community) may be tripped up by accepting outright the idea that our changing rural landscape is a greater threat to wildlife than the status quo. Proponents of this ideology claim (rather loudly in some cases, and without much basis in fact) that the ranchette or condominium development is inherently bad, but the deeded ranch, lumber mill, or gold mine somehow produces a group of "locals" that "we can work with." I fear many conservationists are being controlled by some previously unknown social imperative, or a politically correct new age mantra: if we don't have cows, we will have condos; if we don't have loggers, we will have ski resorts; if we don't have miners, we will have YUPPIE retreats. We're being force fed a generalist notion that we have no options, only simple choices, "cows or condos," and everybody knows that cows are better than condos, Fords are better than Saabs, and beef beats quiche. In my view, we have a multitude of options and to be most effective we best evaluate all the alternatives before we hang up our birkenstocks, don our Dan Post's, and start buckin' hay bales.

Folks concerned about rampant development do have a point. Many of our landscapes do need protection from thoughtless developers. The front range of the Rockies, the Animas Valley, and areas around Vail, Aspen, Jackson and Sedona are obvious candidates. However, I refuse to believe that most of the West will be settled by niblick-wielding octogenarians, or urbanized into biological wastelands. Condos on the Llano Es Tacado are just not big sellers.

Most of my friends and acquaintances who live in southeast Arizona, southwestern New Mexico and other "rural" landscapes moved there because they love wildlife and care about the land. Their love of place does not come from the economic value that the area can provide; it comes from a close relationship with nature. We should not be fooled by individuals or groups that claim to love the land yet continue to degrade or sell it for profit and power. There is a damn big difference between loving the land and loving the lifestyle, power, prestige, and money that the land provides. I'm not claiming every new resident cares about nature, but many do; for many, it is the driving force behind their move. By the same token many, maybe most, of the rural "locals" are not much interested in the natural history of the region and know very little beyond what grasses cattle consume, what trees sell at the mill, or where they saw that six point buck. Our job is to make alliances with those who love the land, not just the consumptive lifestyle afforded by rural customs. By building an alliance of caring citizens, even though they may be "californicators" or worse, we can often build a wilderness and wildlife constituency that would not be there otherwise. In many places it could be the best thing that has happened to the local environment in the last 150 years.

Statement of Purpose

Wild Earth is a non-profit periodical serving ecocentric grassroots groups within the conservation movement. We advocate the restoration and protection of all natural elements of biodiversity. Our effort to strengthen the conservation movement involves the following:

- We provide a voice for the many effective but little-known regional and ad hoc wilderness groups and coalitions in North America.
- We serve as a networking tool for grassroots wilderness activists.
- We help develop and publish wilderness proposals from throughout the continent.
- We render accessible the teachings of conservation biology, that activists may employ them in defense of biodiversity.
- We expose threats to habitat and wildlife, and offer activists means of combatting the threats.
- We facilitate discussion on ways to end and reverse the human population explosion.
- We defend wilderness both as *concept* and as *place*.
- We are the publishing voice of The Wildlands Project: the North American Wilderness Recovery Strategy.

Finally (with full acknowledgment that I'm not a biologist), I'm not convinced that all development bodes ill for the local ecology. As far as I know the jury is still out—in fact, as far as I know they haven't even been impaneled—on the question of the human landscape, in its myriad forms, and its consequences for wildlife. We need comparative studies that relate the built habitat to wildlife habitat, that weigh the effects of cluster development or ranchettes or condos, versus ranches, hay fields, farms, orchards, plantations, agribusiness, etc. No one knows the effects different types of development scenarios might have on native wildlife. In a relative sense, compared to the cow burnt pasture, the pistachio orchard or the clear cut forest, there might be some positive effects.

There are places where we can work with the locals, but we need to be careful about why, where and how we foster these relationships. Our efforts should be geographically and socially site specific. Our undertakings must be based on sound biology and sound social science and we must not compromise because we want to be a player in the local community. Our job is the protection and restoration of native biodiversity, not maintaining the status quo. Biodiversity and organic evolution and are nonnegotiable issues and we need to make that clear from the get-go.

As a final thought I will use an example and define a bottom line strategy for protecting biodiversity and building alliances. The reason there are no wolves left in the Southwest is the Western cowboy culture, which consciously and purposefully destroyed the wolf. Without the ranches, Mexican wolf populations would have had a much better chance to remain viable. Without the vast majority of cattle people in the future Southwestern landscape, the reintroduced wolf would have a much better chance to repopulate its former range. It is my job to work with the ones who will welcome the return of the wolf, but it is also my job to work to rid the West of the ones who won't.

—Rod Mondt, The Wildlands Project, POB 5365, Tucson, AZ 85703

Land and Water Fund Under Assault

As a former intern at the Wilderness Society during the 1994 struggle to get the California Desert Protection Act passed, I witnessed many of the trends Dave Foreman addressed in his Winter 1994/95 editorial: erosion of once supportive Republican members for environmental protection, lackluster mobilization among grassroots inured to stories of impending ecological doom and imminent threats of subdivision, bloated nationals willing, and often forced, to accept a damaging compromise... Tauzin's ESA amendment passed by the House was the foot in the door for the anti-ESA crowd and proved that there was widespread support for ESA "reform" among Democrats as well as Republicans. The Desert Bill was all of these problems encapsulated, and I believe it is the last large-scale lands protection bill this country will see passed by Congress for a very long time. Utah, Idaho, and Montana wilderness bills may eventually get passed, even by a Republican Congress, but they will surely omit a good portion of the worthy USFS and BLM acreage in those states, and will undoubtedly contain "hard-release" language. We may in fact be headed in the opposite direction, as the Republican majority contemplates closing some "low priority" Park Service areas and giving BLM, and perhaps some USFS, lands to the states to do with it as they see fit.

Yet we environmentalists still have the latent force of public opinion on our side, even if it hasn't surfaced recently. Our message needs to be reformulated, made more realistic to regain some of its stridency, if losing some of its incessant urgency which has contributed to the loss of its effectiveness. We have to pick our fights more intelligently, for if we choose to fight for every issue, we are likely to lose them all. Although I am inclined to believe that Gregg Easterbrook is infected with an overly optimistic bright-eyed view of the world, he is right in proclaiming that the past 25 years have seen some remarkable successes (I admit that I have not read his book, nor is it likely that I will, but I did read a condensation of the central message of his book that he wrote for the *New Yorker*). The vehicles for those successes—CWA, CAA, and ESA—are facing full-force assault from the Republican majority; and to be truthful, we should shoulder the blame for not addressing constructively the concerns states, municipalities, and industry have had with the legislation, earlier when we had the opportunity. We are likely to sustain far greater damage to these statutes as a result.

The purpose of this letter, however, is to draw your attention to an issue that while seemingly small, has tremendous resonance and is enormously symbolic. The Land and Water Conservation Fund, established by the same Congress that passed the Wilderness Act in 1964, was recommended for elimination under the Budget Resolutions recently passed by both House and Senate. To be fair to both Rep. John Kasich and Sen. Pete Domenici, chairmen of their respective chambers' Budget Committees, their budget plans left few if any sacred cows and their "pain" was distributed across a wide spectrum of programs, agencies, and services. It is difficult to make a fuss about a few hundred million dollars given the implications these budgets have on the future of Medicare and other programs that directly affect the day-to-day lives of a majority of Americans. Yet given the relatively clear message Congress is sending about overregulation and the need for compensation, it seems ironic that they are choosing to eliminate a prime source for compensating landowners whose property is "devalued" (not an argument I buy

into) as a result of land-use regulation stemming from the federal designation of the surrounding area as a park, wildlife refuge or what have you. Forked tongue indeed.

One of the few crises Gregg Easterbrook supposedly claims has not improved is the disappearance of original habitat from the North American continent. That makes it all the more crucial to protect the habitat already contained in forests, parks, wildernesses and wildlife refuges. Fragmentation of these areas that results from inholding development is especially galling, and hurts more than just the flora and fauna that rely on the affected area. Often, private inholdings hinder public enjoyment of recreational resources by restricting access to a certain area. Consider the massive inholdings in the Gallatin NF in Montana, surrounding the headwaters of the famed Madison River and the #1 USFS priority acquisition for fiscal year 1996. Conrad Burns *supports* the federal acquisition of these properties because of their enormous value as game hunting grounds—they are the wintering grounds for hundreds of Yellowstone elk. Given the burgeoning demand for recreational opportunities, it would seem farsighted to consolidate public holdings in areas capable of providing those opportunities.

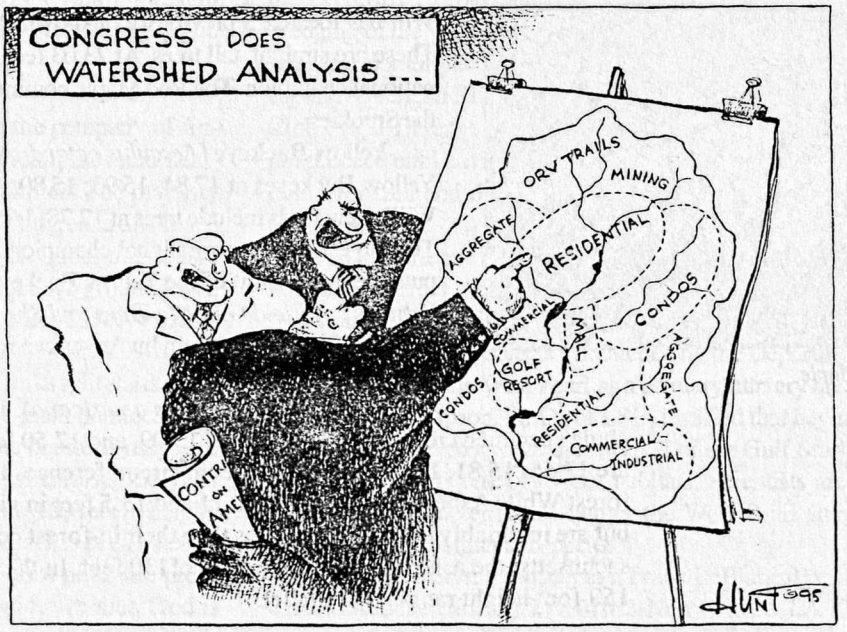
Public acquisition of inholdings within federal land areas has many compelling arguments, but the administration of that acquisition has earned it many critics. Politically well connected landowners, like the developers who have come into ownership of the checkerboard railroad land in the west, are often able to secure funding for acquisition of their lands ahead of those of private individuals who are in much greater need of compensation. Acquisition is heavily canted in favor of federal units within the states of House and Senate Appropriations Committee members, not necessarily those units most in need of inholding acquisition. Taking a wider view, however, yields a picture of remarkable achievements. For thirty years, critical lands have been acquired in every state of the nation, adding immeasurably to the value of those already existing resources, justly compensating the landowners and enhancing management efficiency while lowering costs. Public acquisition of inholdings makes sense; yet both House and Senate, at the insistence of people like Sen. Don Nickles and Rep. Charlie Taylor who seem to confuse new area designation with inholding acquisition, are shutting down the program that supplies money for that purpose.

Although the Land and Water Conservation Fund (the monies of which are *not* derived from tax receipts, but instead from the royalties from Outer Continental Shelf drilling receipts) is authorized to receive $900 million annually, since 1980 it has been funded at an average of $270 million annually. The difference has been used to cover shortcomings elsewhere, so as not to increase the debt load; meanwhile the acquisition backlog for the four land management agencies has reached into the billions of dollars. The legislation as originally written called for a portion of the fund to be dispensed in equal shares to the states each year as a means of assisting their own open space protection plans and needs. The amount now given to states has dwindled to insignificance (since FY88 less than 10% of the total funds appropriated to LWCF), but the record of state and local acquisition using this federal funding as leverage is truly outstanding. This further points out the benefits of the LWCF and land acquisition.

As I said, environmentalists need to pick their fights wisely. Federal funding for inholding acquisition is one.

—Timo Fritzinger, 30 Eighth St. NE, Washington, DC 20002

P.S. Since I wrote the bulk of this letter, the House Interior Appropriations Subcommittee marked up its fiscal year 1996 bill based on the House Budget resolution. The Land and Water Conservation Fund was funded at $51 million, its lowest level ever. More than half of that money is slated for administrative expenses and the rest is for "emergency acquisitions" and "hardship cases." Unless the Senate writes a significantly better bill, the tremendous legacy of the LWCF is likely to stop growing.



cartoon by Susan Hunt

Updates

Smoky Mountain Big Tree Update

Will Blozan has located 8 new candidate national champion trees and at least 25 state champions within the Great Smoky Mountains National Park's modest 800 square miles. Will's discoveries place the Great Smoky Mountains firmly at the top of the list of areas that grow champion-sized trees. No other comparably-sized area of deciduous temperate forests within the United States and probably all North America surpasses the Great Smokies for number of champion trees. But more important than just tree size, Will's finds document Mother Nature's capacity to shape her species to adapt to different environmental conditions. Nature works to enhance the chances for survival of her species through adaptability in a bewilderingly complex set of environmental conditions. The result is infinite diversity, but we humans have gradually reduced the environments in which species can flourish. This has occurred in the eastern US over several human generations, so the perceptions of each generation may be unconsciously skewed to what is observed in the present. It is important that our base of knowledge be broadened to understand what has happened to species, with special attention to what that species was prior to settlement by European Americans. If capacity to reach maximum recorded sizes and ages is in decline, we should be asking why. This requires that we know what a species is capable of doing in terms of distribution, size, and age. I am coming to realize just how much our perceptions have been skewed downward by the second rate, second-growth forests to which we have become accustomed. Disease, insect infestation, and atmospheric pollution are weakening virtually every species; future forests are almost guaranteed to have abbreviated life expectancies. Consequently, it is extremely important to document the old-growth forests of the Great Smoky Mountains. It is a sobering thought that few if any of the Smoky Mountain big trees would be allowed to survive in "managed" forests. Had the Smokies been under the jurisdiction of the United States Forest Service, as opposed to the National Park Service, an irreplaceable data bank would likely have been lost forever.

Will Blozan photo

Red Maple

The following is a partial description of Will Blozan's recent finds (see "Will Blozan and the Big Trees of the Great Smokies," summer 1995 *Wild Earth*). Future articles will update the big tree information.

Striped Maple (*Acer pensylvanicum*). Will has found 3 trees larger than the previous park champion. Their girths are 40.08, 42.36, and 45.24 inches. The national champion Striped Maple is 50 inches in girth. The largest Striped Maple I have personally measured is 42 inches in girth and grows on the west side of Mount Greylock in Massachusetts.

Red Maple (*Acer rubrum*). In some ways the Red Maple is the surprise tree of the Smokies. The previous park record is an amazing 18.33 feet in circumference. Will has located 5 previously unknown Red Maples with girths of over 16 feet. These are straight, tall trees. At 23.03 feet in circumference, the largest is the new national champion. The Red Maple commonly reaches 120 to 145 feet in height in the Smokies.

Yellow Buckeye (*Aesculus octandra*). Park records list previously measured Yellow Buckeyes at 17.84, 15.93, 15.80, 14.67, and 12.68 feet in circumference. Will's new finds include trees at 17.78, 16.94, 16.85, 16.39, and 15.91 feet around; The largest is the new national champion. *The Complete Trees of North America* puts the upper limit of the Yellow Buckeye's size at 3.3 feet in diameter. George Petrides's *A Field Guide to Trees and Shrubs* gives 3 feet as the maximum diameter. The Smoky Mountain buckeyes can reach 140 feet and more. At least one has been measured to 145.

White Ash (*Fraxinus americana*). Previous park records for this tree include specimens reaching 15.43, 13.34, 13.09, and 12.50 feet in circumference. Will's new finds are 17.56, 15.81, 15.58, and 14.20 feet in circumference. The very largest of New England's in-forest White Ashes measure between 11 and 13.5 feet in girth. Field grown ashes can get larger, but are invariably much shorter trees than their in-forest counterparts. In the Berkshires of Massachusetts, the ash can grow to a height of130 feet. In the Smokies, the ash reaches the 130- to 150-foot height range, if not taller.

Tulip Poplar (*Liriodendron tulipifera*). The cove tuliptree is the very symbol of the Great Smoky Mountain virgin forest. From Will's research, previous park champions have been measured at 23.6, 23.04, and 21.00 feet in girth. Will's new finds include trees at 22.37, 21.24, 21.03, 20.72 and 20.48, feet in circumference. Will and I intend to obtain additional measurements on these great trees this August, including heights. So far, the tallest poplar we have measured is a tree near the Horace Albright Nature Trail, at just under 170 feet!

White Pine (*Pinus strobus*). Prior to Will Blozan's arrival on the scene, the champion White Pine was listed at 10.50 feet in girth. Oddly, no others were documented over 10 feet around. Will's finds include pines at 12.95, 12.72, 11.34, 10.93, and 10.55 feet in girth. Will recently discovered a great White Pine in the Cataloochee District of the park that measures 11.44 feet in circumference and reaches the amazing height of 172.2 feet. He believes several other trees in the stand are in this range.

Black Cherry (*Prunus serotina*). Previous park champions are listed as 13.6, 13.01, 12.50, 12.34, 12.26, and 11.00 feet in girth. In 1992, I measured a Black Cherry in the Smokies at 15.5 feet in girth. I thought I had found the park champion, but this claim was short-lived. Since 1992, Will's finds include cherries measuring 17.39, 17.33, and 13.50 feet in girth. Will estimates the height of one of the seventeen footers at 125 feet. As a point of comparison, the largest cherry I've measured in the Adirondacks is 10 feet in circumference. The largest of the in-forest cherries I've measured in the Berkshires measures 9.5 feet in girth.

Northern Red Oak (*Quercus rubra*). The Northern Red Oaks in the Smokies are something to behold. Prior Park big trees include specimens measuring 21.50, 19.33, 19.01, 16.76, and 15.97 feet in girth. Will has added specimens with girths of 17.68, 17.58, 16.85, 16.76, 16.49, 16.35, 16.18, and 15.89 feet. None of these trees are squat pasture oaks. They are in-forest giants that rise 60 feet or more to the first limb. Will estimates one of the seventeen footers at over 150 feet in height.

Cook Forest Big Tree Report

I spent most of this past April 29 in the company of Anthony Cook and others measuring the great pines and hemlocks of Cook Forest in western Pennsylvania. The majority of large hemlocks are 9 to 12 feet in circumference and reach heights of 100 to 130 feet. In one area of Cook, the mature hemlocks form a canopy 100 to 125 feet above ground level. The largest single hemlock we found measures 16 feet 4 inches in girth, reaches a height of 122 feet, and sports an average crown spread of nearly 65 feet. Its double fork (split starts about 16 feet above ground level) provides the giant hemlock with an uncharacteristically broad spread. The hemlock may be a state record. The crowning glory of Cook Forest is its 350-year-old White Pines. I measured 6 that surpass 160 feet in height. All 6 beat the tall pine in Hearts Content that has been listed as the tallest in Pennsylvania. The Cook Forest pines are probably the tallest in the state. The tallest pine we measured is 164.7. A past blowdown took out the cream of the crop. Some are reported to have been in the 200-foot class.

Summary: To most, chasing big trees must seem little more than a sport for eccentrics. However, the objectives of many of us go farther than competing for the honor of crowning champions. Notwithstanding what my good friend John Davis might describe as evangelistic leanings and unbridled enthusiasm (I'm guilty as charged on both counts), I seek to gain an understanding of what each species is capable of achieving in different growing environments. The information is useful in measuring and monitoring species decline. A case in point is the White Pine. Historical accounts of sizes and ages for *Pinus strobus* sound improbable, yet no less a personage than Donald Culross Peattie reported a White Pine on land owned by Dartmouth College in New Hampshire that measured an astounding 240 feet in height. That is quite respectable for a Douglas-fir, although that west coast species can get much taller. Nonetheless, Peattie averred that the tall White Pine was not exceptional. In historic times, pines were reported in the over 200-foot height range throughout New England, in Pennsylvania, and the Great Lakes states. A few accounts can be dug up for areas in the Southern Appalachians. I would be very surprised if the current generations of White Pines are even genetically capable of reaching such dimensions. What has happened? Is the White Pine yet another case of human meddling with Nature and abuse of the environment compromising the potential of a species?

—*Robert Leverett*

GULF STURGEON AND PEARL RIVER UPDATE

In late May, federal judge G. Thomas Porteous blocked the US Army Corps of Engineers from proceeding with the dredging of the West Pearl River. (See Gulf Sturgeon article in *Wild Earth* summer 1995.) Plaintiffs Orleans Audubon Society and American Rivers are represented in this case by Sierra Club Legal Defense Fund. The judge ordered that dredging not proceed until environmental plaintiffs have had the opportunity for trial and decision. A trial date has been set for 23 October 1995.

Judge Porteous agreed with the plaintiffs that the Corps failed to consider the effects of dredging and diverting river flows on the Pearl River ecosystem and in particular the Gulf Sturgeon. This fish, listed as Threatened by the Department of the Interior, uses the West Pearl as a primary nursery area.

Bruce Thompson, Ph.D., of LSU, testified that beginning dredging would jeopardize the survival of the Gulf Sturgeon. The West Pearl is one of its last habitats. Scientists are currently trying to determine whether the West Pearl sturgeon population is a distinct subspecies.

For more information, contact Frank LeBlanc, President, Orleans Audubon Society, POB 4162, New Orleans, LA 70178.

Road RIPort #3

AS A *WILD EARTH* READER, you know what damage roads wreak on wildland ecosystems. You know about the incredible loads of silt that erode off roads into streams, you know the way roads disrupt and fragment the habitat of sensitive wildlife species, and you're very aware of the role of roads in allowing access for industries exploiting wildlands.

But that's not the case with the "public at large." Most people don't know how much damage roads cause, let alone how they may be personally affected by it.

This sort of ignorance can only feed the current political climate, and reflects the crying need for public education. That's a need ROAD-RIP is responding to with an introductory brochure outlining the effects roads have on wildlands. The brochure lists some of the primary ways roads damage ecosystems: habitat fragmentation, roadkills, erosion and stream sedimentation, and allowing the pollution and overuse of otherwise pristine areas. It then describes ROAD-RIP's approach of getting roads removed to restore ecosystems.

We've also produced a bookmark to accompany *Clearcut: The Tragedy of Industrial Forestry.* In simple terms, the bookmark suggests reviewing *Clearcut* to see just how much industrial forestry damage is due to roads.

We're now distributing both these items. If you have suggestions for distribution points, please let us know.

At the same time, ROAD-RIP is continuing to support the road-fighting efforts of the groups in our coalition. There is more success to report from Keith Hammer and the Swan View Coalition, who have gotten the Flathead National Forest to schedule obliteration of another 650 miles of road. At the other end of the spectrum, as of this writing, Corridor H Alternatives reports that, despite widespread opposition, the West Virginia Department of Highways is proceeding with plans to construct a 100-mile 4-lane pork-barrel highway that will cut through both the George Washington and Monongahela National Forests.

To work toward protecting and expanding roadless areas in support of The Wildlands Project's wilderness recovery goals, ROAD-RIP is continuing to train more road-rippers around the country. We held our first road-ripper's workshop and began distributing the *Road-Ripper's Handbook* in June. The handbook contains each of the individual guides we've produced:

- *The Road-Ripper's Guide to the National Forests*
- *The Road-Ripper's Guide to the National Park*
- *The Road-Ripper's Guide to the Bureau of Land Management*
- *The Road-Ripper's Guide to National Wildlife Refuges*
- *The Road-Ripper's Guide to Off-Road Vehicles*

In addition to these guides, the handbook's resource section is packed with information on FOIA requests, the ecological effects of roads, road impact assessment, contacting federal land management agencies, recommended books and articles, and more. You can get a handbook by sending us $12 (our cost), or $3 each for the individual road-ripper's guides, to our main office.

As for our main office—it's moved from Michigan to Missoula, Montana. We think Missoula will be a good location since it is close to a lot of road-fighting innovation that ROAD-RIP can integrate into its program to help road rippers across the country. Missoula is also surrounded by extensive federal wildlands, critical to large-scale wilderness recovery, on which to practice road-ripping skills.

The move took place as codirectors Bethanie Walder and Marion Hourdequin took over for the two of us. We will remain on ROAD-RIP's steering committee, but you'll get ROAD-RIPorts from Bethanie and Marion from now on. We're excited to have them working for ROAD-RIP.

Bethanie Walder brings to ROAD-RIP a passion for wilderness, direct experience with Forest Service bureaucrats, and a master's degree in environmental studies from the University of Montana. Her concern for saving wild places led her to focus her graduate work on forest and public land issues. She has solid connections with the activist community in the Northern Rockies, having worked with Hells Canyon Preservation Council, Missoula's Ecology Center, and Women's Voices for the Earth.

Marion Hourdequin comes to ROAD-RIP with a degree in Ecology and Evolutionary Biology from Princeton University, where she was President of the college chapter of the Society for Conservation Biology. She's dedicated to the idea of combining science and activism, and has organized demonstrations opposing Clayoquot Sound logging and worked to conserve Sterling Forest in southern New York state. Her scientific field work has included monitoring air quality in New England, analyzing mistletoe ecology in Chilean deserts, and studying marine biology in Washington state.

Contact Bethanie, Marion and ROAD-RIP at POB 7516, Missoula, MT 59807 (406-543-9551) to join a growing corps of road-rippers!

—Katie Scarborough and Kraig Klungness

In addition to being co-founders of ROAD-RIP, Katie is the newest member of Wild Earth*'s board of directors, and Kraig is a leader of Northwoods Wilderness Recovery.*

New York's Allegany State Park Threatened by Logging Plan

by Ellen Gibson

Allegany State Park is a magnificent, forested park located in southwestern New York State. Unfortunately, the Park forester and local businessmen characterize the Park's forest as "overmature" and see logging as the solution to this problem. In late 1992, the Office of Parks produced a Draft Master Plan and Draft Environmental Impact Statement for managing Allegany State Park. The stated purpose of the Draft Plan is to increase wildlife and forest diversity *within* the Park, principally through logging. The logging portion of this Draft Plan was presented in six alternative proposals. The preferred alternative of the Parks Office is Alternative Four. It calls for logging almost 600 acres of Park forest each year for 30 years. About one-half of the logged area would be kept open for deer browse. The other half of the logged area would be allowed to regenerate as managed woods.

To place this logging proposal in context, approximately 56,000 of the Park's 67,305 acres are forested. So, the proposed plan would log about 27% of the Park's forest. Fifty percent of the trees in the Park are over 80 years old; 15 percent are over a century old. Most of the Park's trees are mixed hardwoods, but the Park contains some unusually dense and extensive stands of Black Cherry trees, which are extremely valuable commercially. When the parkland was acquired over a period of years, the Office of Parks could afford to buy the surface land but not always the subsurface rights. Today, subsurface mineral rights beneath much of the Park are not owned by the State; in fact, the Parks Office does not know who owns many of these rights and can't afford the legal work required to discover ownership.

In terms of regional biodiversity, the Park contains the largest block of contiguous forest in western New York and thus provides scarce habitat for species requiring remoteness and large ranges. The Park is surrounded by farmland and over 745,000 acres of publicly and privately owned forests that are managed for timber production, including the huge Allegheny National Forest, which lies just to the south of the Park in Pennsylvania.

The Office of Parks states that Alternative Four will increase wildlife and forest type diversity *within* the Park and that it will retain most of the Park's forest in a non-managed state to benefit *regional* biodiversity. While the drafters of Alternative Four would have us believe that the Park areas chosen for logging are particularly suitable for the development of browse and diverse forest types, a comparison of the Draft Plan maps suggests otherwise. The chosen logging sites are clustered in parts of the Park where mature Black Cherry trees are most abundant and where most of the subsurface mineral rights are not owned by the Park. If a logging road network is created at taxpayer expense, access to previously roadless areas would be convenient and economical for mineral rightsholders.

As if Alternative Four weren't bad enough, local business interests reject the proposed alternative as too modest, and continue to press for placing the entire Park's forest into a harvest rotation, calling that "wise use" of the Park's resources. Sound familiar?

At this writing (mid-June), the fate of the Draft Plan rests with Governor Pataki and his new Parks Commissioner, Bernadette Castro. People who appreciate Allegany State Park's importance to *regional* biodiversity need to keep up the pressure on them. Please write to the Governor, with a copy to the Commissioner. Urge him to drop the forest management idea in Allegany State Park. Here are some points to make:

1. Allegany State Park's biodiversity must be considered in a regional rather than a local context. Allegany provides the last stronghold in New York west of the Adirondacks for wild-

life requiring large, unfragmented blocks of forest. These species include Black Bear, Bobcat, Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Broad-winged Hawk, Pileated Woodpecker, Hermit and Swainson's Thrushes, Ovenbird and many warblers. Allegany's unique contribution to regional biodiversity should be appreciated and protected.

2. Creating more field, edge, and early successional stage forest by logging in the Park would increase nest predation of forest birds by Blue Jays, American Crows, Common Grackles, Raccoons, and Striped Skunks. It would also increase brood parasitism of forest birds by cowbirds. Many neotropical migrant songbirds that nest in Allegany forests are already in decline across their ranges; adoption of forest management in the Park would likely accelerate that decline.

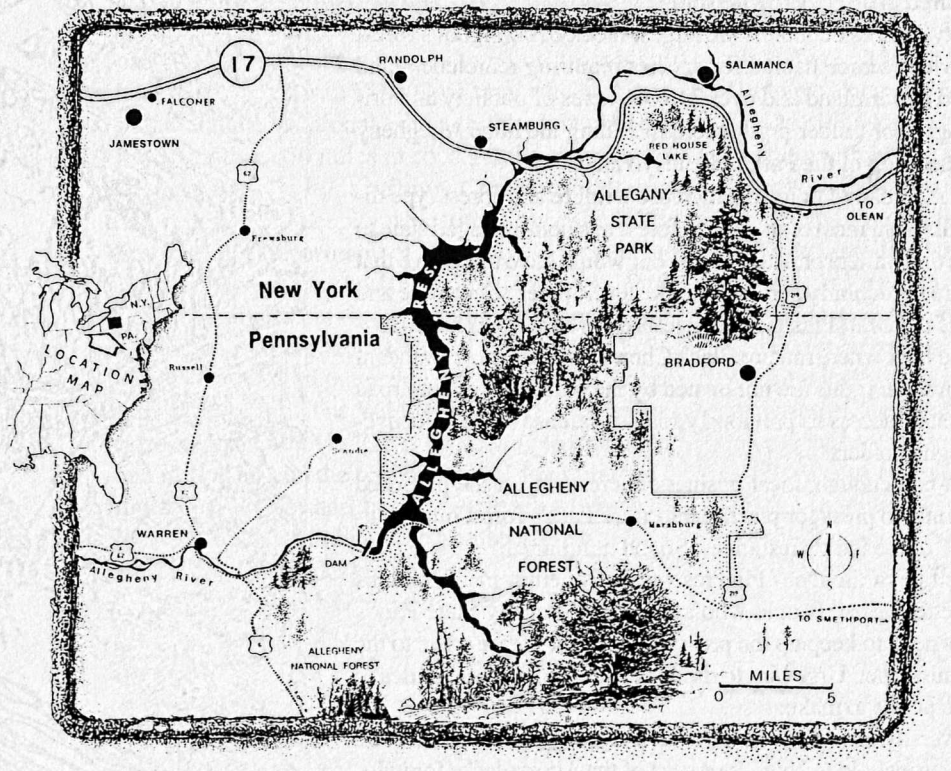
3. The Park is an important part of the tourism economy of western New York. Many people who seek the peace and aesthetic beauty now found in the Park would be repelled by the fragmented landscape that would result from adoption of Alternative Four.

4. Logging roads would facilitate access to underground mineral rights not owned by the Office of Parks. Mining, oil drilling, and gas exploration in the Park would exacerbate the environmental and aesthetic problems brought about by adopting Alternative Four.

5. The logging roads also would facilitate game and timber poaching in the Park. While the Draft Plan provides for extra personnel to handle the logging, no mention is made of extra police personnel.

6. The plan to introduce forest management at Allegany is a radical departure from the Parks Office's long-standing policy of allowing forests within the State Park System to undergo natural succession. Forests achieve diversity naturally through die-off from old age, blowdown, and disease. The old trees remain standing as snags or lie on the forest floor, continuing to play important roles in the forest ecology long after they "die." Adopting a forest management precedent at Allegany not only would be bad for that forest, it would also set a dangerous precedent for New York's other large forested parks, such as Bear Mountain and Harriman.

7. A survey of both day users and campers at Allegany State Park undertaken in the 1980s by the Parks Office revealed overwhelming opposition to logging the Park. Thousands of letters protesting this plan have been sent to the Commissioner. The Citizens Campaign for the Environment has collected over 85,000 signatures opposing the logging plan. Clearly, the citizens and taxpayers in New York want Allegany preserved as a natural Park.



map by Chuck Ouray

Ellen Gibson volunteers on behalf of Allegany Park through the Adirondack Mountain Club (POB 867, Lake Placid, NY 12946) and Buffalo Audubon Society (1610 Welch Rd., North Java, NY 14113).

Send your letter to:
Governor George Pataki
Capitol Building
Albany, NY 12224

With a copy to:
Commissioner Bernadette Castro
Office of Parks, Recreation & Historic Preservation
Agency Building One
Albany, NY 12238

British Columbia's Spirit Bear of the Rainforest

by Carl D. Esbjornson

Princess Royal Island is one of the world's largest intact temperate rainforests. Located just off the coast of British Columbia, the island is home to old-growth Sitka Spruce, Western Red- and Yellow-cedar, Western Hemlock, Timber Wolves, Sitka Deer, and numerous bird species, including ravens, Bald Eagles, loons, kingfishers, and Dippers. Channels provide food for Orca, Humpback Whales, Harbor Seals, and porpoises. During the spawning season, streams brim with Chum Salmon, and Black Bears come to feed on them. Most but not all of the bears have sleek blue-black coats.

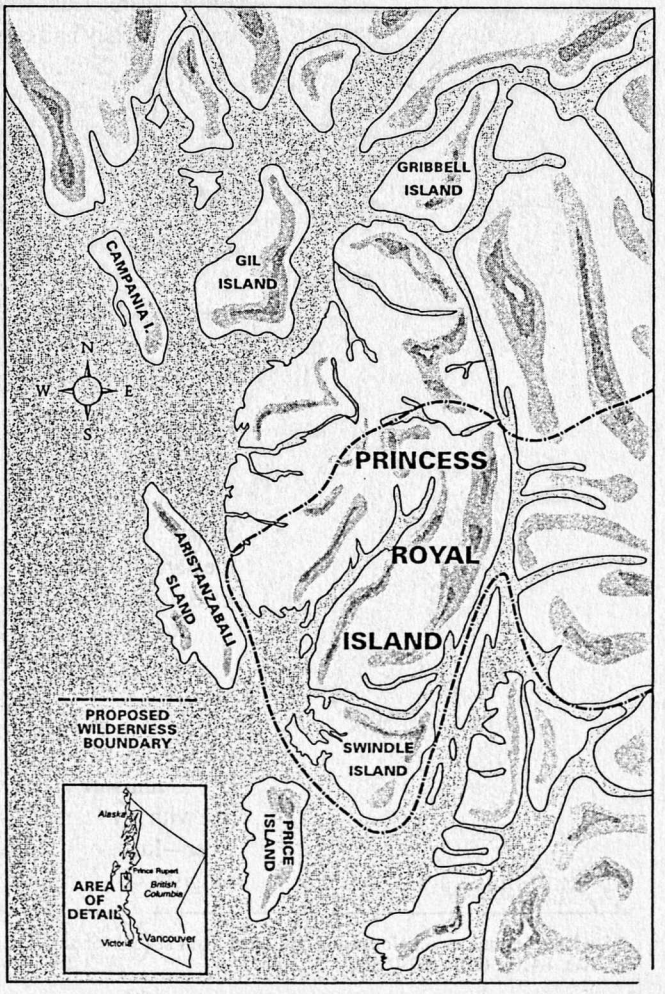
What is most unique about Princess Royal Island is that it is home to *Ursus americanus kermodei*, the Kermode (or "Spirit") bear, a subspecies of Black Bear that occurs only in this section of coastal BC. One in ten of these bears is white. A mating pair of black bears can produce a white cub and the chances for a white cub increase if one of the parents is white.

To the native Tsimshian peoples, the Kermode Bear is "Moksgm'ol" (the "white bear"). One native legend has it that Raven, the Creator, gave one of every ten bears white coats to remind the people of a time when glaciers covered the area, leading to unproven speculation that the recessive white gene might be a holdover from the Ice Age. According to this story, the Raven decreed that the white bear would live in peace on Princess Royal Island in perpetuity.

However, Western Forest Products is poised to break Raven's legendary decree. Logging BC-style will destroy the salmon and as the salmon go, so will "Moksgm'ol," unless the government of British Columbia agrees to support the proposed 750,000 acre (300,000 hectare) Spirit Bear Sanctuary consisting of Princess Royal Island, Swindle Island, and the Khutze-Green Inlet. The Valhalla Wilderness Society and the Great Bear Foundation have joined forces and are leading a campaign to pressure the BC government into creating a Spirit Bear Sanctuary. The good news is that the current BC government is committed to following the Brundtland Commission's recommendation of setting aside 12% of its land for wildlands preservation and is taking the Spirit Bear proposal seriously; the bad news is British Columbia's long history of failing to stand up to the timber industry—the incredibly destructive clearcutting in that province testifies to this failure.

Carl Esbjornson, whose last name means "Son of the Bear God," is a free-lance writer, self-avowed ursamaniac, and member of the Great Bear Foundation (POB 1289, Bozeman, MT 59771), a non-profit environmental organization devoted to the conservation of all eight species of bear and their habitats worldwide.

Proposed Spirit Bear Wilderness
Prince Royal Island, British Columbia



You can help make the Spirit Bear Sanctuary a reality and uphold Raven's legendary guarantee to Moksgm'ol by writing letters to:

Premier Mike Harcourt
c/o Parliament Buildings
Victoria, BC V8V 1X4
Canada

Elizabeth Cull
Minister of Environment
c/o Parliament Buildings
Victoria, BC V8V 1X4
Canada

For more information contact:

Great Bear Foundation
POB 1289
Bozeman, MT 59715
(406) 586-5533

Valhalla Wilderness Society
Box 224
New Denver, British Columbia
V0G 1S0 Canada

Scenes on a Round River

THIS IS THE FIFTH WINTER OF SLEEP FOR THE COLORADO GRIZZLIES since we first believed they were there. They have always been there, but only recently have we believed in them.

The sow with cubs that was seen back in 1990—if her cubs were 2- or 3-year-olds back then, they're mature now; and she has perhaps had another litter in the meantime. And surely—or hopefully—one of those three cubs was, or is, another female. And hopefully she's found a male, once more, with whom to mate.

An odd thing happened the year after we found scat in Colorado's San Juan Mountains with Grizzly Bear hair in it—the year after the year of the sighting of that sow with her cubs. Jim Tolisano and the Round River students were back near that same area, mapping vegetation types and densities, when they came upon some Forest Service personnel coming down from the high country. Surprised to see other people in this area, Jim asked—just making conversation—what was up.

The Forest Service people acted nervous and secretive. They hemmed and hawed, Jim says, and finally came up with some story about trying to document an endangered butterfly. They had come out of the headwaters of where we jumped the Grizzlies.

I think they're starting to believe, too.

Our job is no longer to convince anyone that the bears are there. Our job now is to convince people to take care of the land where the bears still live—to manage it in a way that will not bring further harm to these last bears.

○

This winter, word leaked out to Dennis Sizemore about a photo that's been sitting in the Colorado Department of Wildlife for some time now: a photo of a bear taken not far from where we found our first scat. Most who have seen the picture identify it as a Grizzly, well maybe a Grizzly.

It's not that there's any enormous cover-up going on. There's just the usual grudging hesitancy to act, and to commit.

○

Round River Conservation Studies is blossoming. Christopher Filardi, Jerry Scoville, Nina Chambers, John Wickersham and Dwight Barry are directing field research. Besides the San Juan Grizzly project, Round River is conducting the Sky Island Mexican Wolf, the La Sal/Canyonlands, the Heiltsuk/Hidden Coast, and Belize Jaguar projects.

Round River is effecting change. It is leaving places better than they were before.

○

Dennis and I are down in Tucson drinking margaritas in February, sitting outside feeling the desert's warmth on our winter skin. Doug Peacock is off walking somewhere.

Dennis says that working with Peacock in the San Juans has given him "more courage with my science"—courage to speak his heart, and to speak about the roundness of the river—knowing that he has the science to back it up. Aldo Leopold's "new" breed of biologists, 40 years later.

by Rick Bass

* Students desiring more information on Round River should contact the Round River Admissions Office at 4301 Emigration Canyon Road, Salt Lake City, Utah 84108; (801) 582-0919.

Dennis says that in public meetings, "We all think, *What would Doug think? What would Doug Say?*

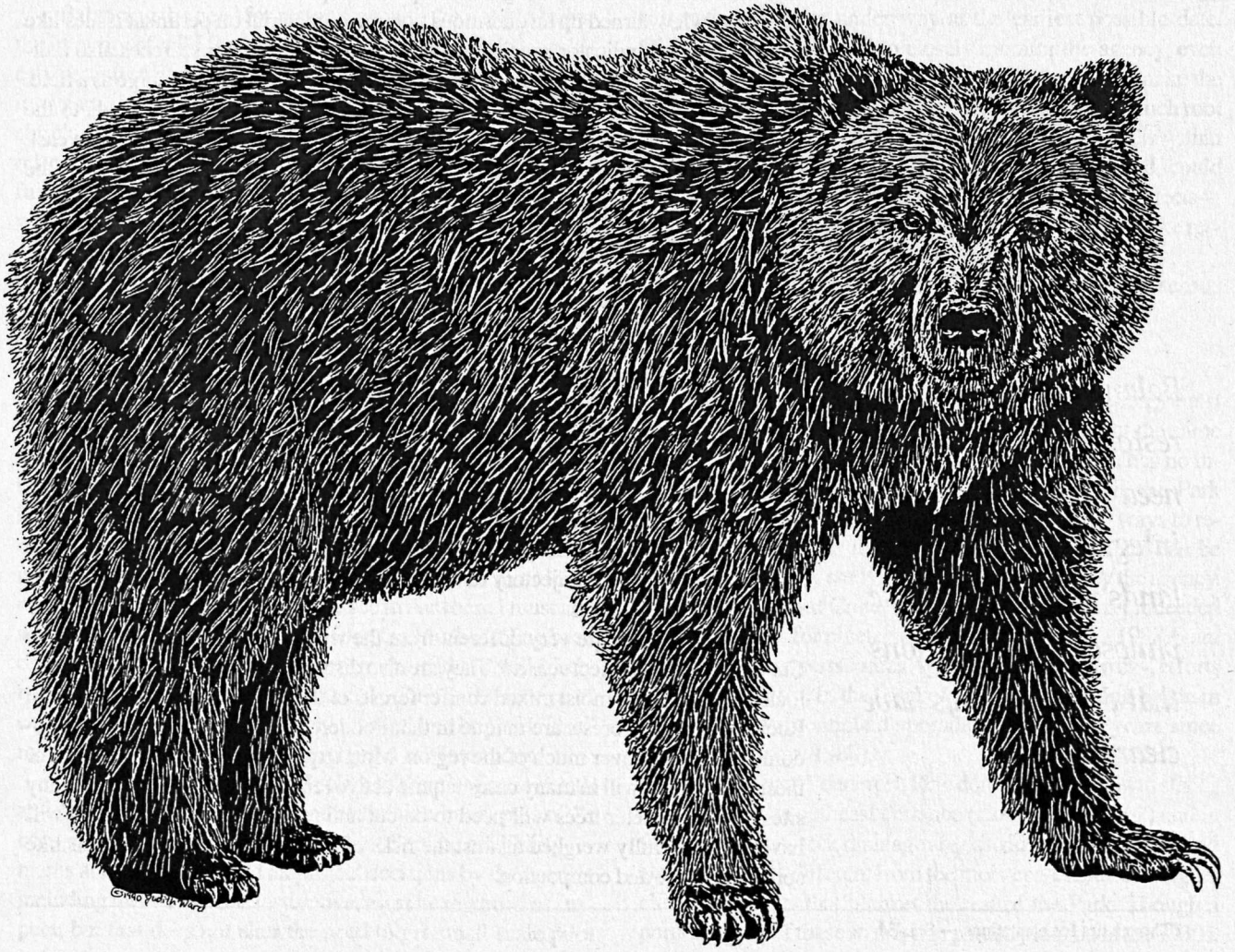
"Peacock—when he goes to these meetings—you can take him to the Rotary Club, or the Elks, or whatever—and he's a goddamned war hero and a radical environmentalist, all rolled into one. You can't criticize one and love the other. People get confused, and they end up just listening to him, and they like him."

○

One more scene: A campfire, once again—any campfire, and every campfire. Or it could be standing in the driveway at Betty Feazel's ranch in the San Juans—no matter. A bottle of wine or a beer has just been opened. Doug always pours just the first sip of it, a small slosh of it, on the ground, for the earth and for the memory of all those who have been lost to us.

The thirsty, hungry lips, who no longer have what we have—*life!*—and all that loss, and so much waste, among those losses...

Rick Bass is the author of The Ninemile Wolves, Winter, In the Loyal Mountains, *and many other published natural histories, essays, and stories. He lives in Montana's Yaak Valley, and is presently working on a book about Colorado's "Lost Grizzlies," from which these scenes are drawn.*



Grizzly *illustration by Judith Ward*

Eastside Forest Restoration

Three Projects

by Mark Gaffney

INTRODUCTION

In November 1993, I was commissioned by Concerned Friends of the Winema (CFOW) to attempt a comprehensive review of the scientific literature on eastside forest restoration. I was asked to identify appropriate restoration tools and techniques, and to research the question, can forest restoration proceed without compromising habitat deemed critical for old-growth dependent species?

The review turned up an enormous volume of material on pertinent issues like fire ecology and indicator species. However, several computer searches also indicated that, as of late 1993, forest restoration was only beginning to emerge as a field. Only two projects were initially identified in a region bounded by Canada to the north, California to the south, the Cascades in the west and the Rockies to the east. Later, a third project came to light. Two of these projects are being sponsored by the National Park Service, and one by the US Fish and Wildlife Service.

ASSESSMENT OF NEED

After reviewing a mountain of papers and articles in the context of field experience ranging over five National Forests, I concluded that the evidence is strong: Eastside forests are in serious trouble, and not solely from logging, though that remains a leading concern. In many areas forest health and/or fuel loading concerns are real, and the need for restoration is urgent. Though the dry forests east of the Cascades flourished for millennia in the face of some of the harshest conditions Mother Nature can deliver, these same forests have proved fragile, with the historically unprecedented and massive human-caused perturbations of the past century: road building, high grade logging, clearcutting, cattle and sheep grazing, and fire suppression. In fact, human abuses have so perturbed eastside forests that entire ecosystems today are on a trajectory of decline that would continue even if *all* cutting were permanently halted.

Balancing the need for restoration with the need to honor the integrity of wild forest lands is certain to raise philosophical questions that do not always have clear answers.

Eastside forests are very different from the wetter coastal forests, where a *No Cut* policy makes perfect sense.* They are also distinctively different from the hemlock and other more moist mixed conifer forests of the Inland Empire and Northern Rockies. Eastside forests are unique in that Ponderosa Pine is the dominant or co-dominant species over much of the region. Most experts agree that preservation of these pine forests will in many cases require active remedial interventions. On many sites, small diameter trees will need to be cut and removed, though the need will have to be carefully weighed against the risks of creating additional problems like soil disturbance and compaction.

*Though not for plantations. —Sci. Ed.

Balancing the need for restoration with the need to honor the integrity of wild forest lands is certain to raise philosophical questions that do not always have clear answers. In the coming years, these issues are likely to be further compounded by shrinking federal budgets, with subsidies for non-commercial restoration increasingly difficult to obtain. Whatever modest funding *can* be secured will need to be earmarked for areas where commercial entry is not welcome.

In roaded areas, forest restoration generally will have to pay its own way. Hopeful in this regard is that the need to cut trees to achieve restoration means that some common ground does exist between the timber industry and the environmental community, perhaps enough to get restoration moving. Of course, whether we will get true restoration or some bastard derivative remains to be seen.

Because eastside restoration will involve cutting some timber, simplistic formulas will not help activists in evaluating individual projects. Projects will need to be analyzed and judged on a case-by-case basis. We environmentalists, therefore, will need to be smarter and better informed than ever, in order to recognize true restoration when we see it. And here I must add a sober warning. If we fail in this, for example, by falling back on simplistic *No Cut* sloganeering, in the end we will likely unravel much of the good work already done in the service of eastside forests, and unwittingly strengthen the "wise use" movement in the process, however good our intentions.

For all these reasons, it is foolish to dismiss forest health and fuel loading issues as a Forest Service hoax, part of "a conspiracy to sell more timber." Forest Service credibility remains at low ebb, yes, and all project decisions by the agency, including those touted as restorative, must be regarded as suspect; but that does *not* alter the need to get small-scale pilot restoration projects under way at the earliest possible date. Obviously, we will need to closely monitor the agency, even while we press hard for the deep reforms needed to make the Forest Service accountable. I recently proposed one such root reform, creation of a process of independent peer review within the agency (Gaffney 1994). Such a move, if adopted, could create the safeguards necessary to scale up pilot projects—where they prove successful—to the level needed to make restoration effective across the broader landscape.

Where should restoration begin? Wherever consensus exists among top scientific experts.

CRATER LAKE NATIONAL PARK

Because of its commitment to resource extraction, Forest Service-proposed projects remain problematic. But the same cannot be said of the National Park Service, which has no incentive to sell timber. Consistent with its mission, the Park Service has been the leader in actively researching ways to restore eastside forests to historical conditions. Much can be learned by carefully studying projects sponsored by the agency.

One project at Crater Lake National Park has proceeded in fits and starts for nineteen years. According to a 1988 *Final Report* by fire experts James Agee and Michael Swezy, efforts to reintroduce fire in the form of prescribed burning began in 1976 and have continued sporadically over the years since (Agee and Swezy 1988).

The remnant Ponderosa Pine dominant old-growth stands near the Park's southeast entrance (along highway 62) and in the nearby Sun Creek drainage are eastside in composition and structure—very different from the moister westside and higher elevation forests that blanket the rest of the Park. Though a portion of one of these stands was partially logged in the 1930s,

illustration by Peggy Sue McRae

before the land could be acquired and protected, most of the forest being restored has never seen an axe or chainsaw.

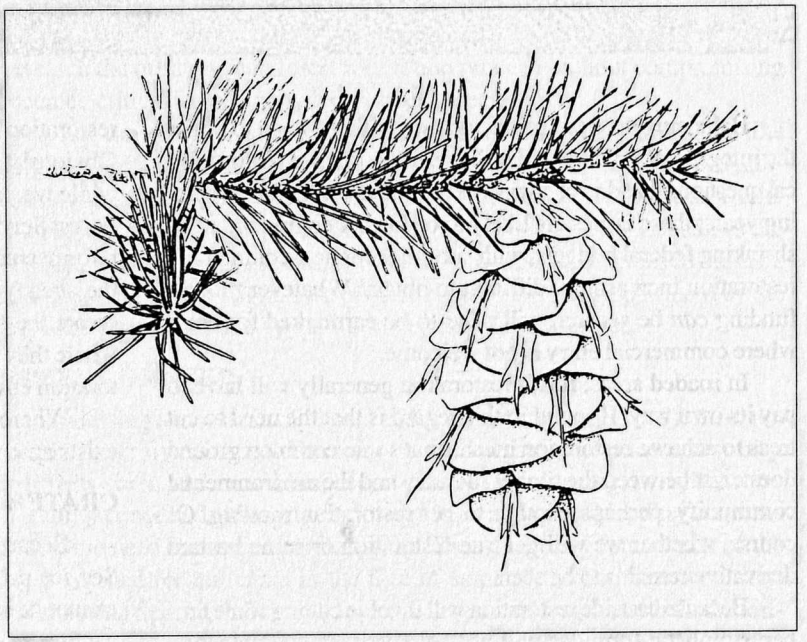
Why, then, restoration? The rationale given by the Park Service is partly aesthetic but mainly ecological. From studying old fire-scars, scientists determined that these stands were much more open and park-like under the canopy historically than at present, due to frequent low-intensity wildfire. Many years of aggressive fire exclusion have had several deleterious effects. The first was heavy accumulation of ground litter and duff. Eastside forests are so dry most of the year that ground litter decays much more slowly than it accumulates. Nature solved the problem through a regime of frequent low-intensity wildfire. As in much of the interior West, ground fires periodically burned off duff and litter, keeping ground fuels in check (Harrington and Sackett 1992). With wildfire suppression, however, litter and duff built up steadily. Though Ponderosa Pines are extremely resistant to fire, even these trees are at risk when brush and ground fuels exceed a certain threshold. Ground fuels today far exceed this level on most eastside forests. Experts estimate that present fuel loading averages at least four times what existed historically (Schmidt et al. 1993). This fuel loading largely accounts for the present extreme fire danger across the eastside.

A PINE SITE IS A PINE SITE

Another major problem stemming from fire suppression is fir encroachment. Historically, the eastside's park-like stands of climax Ponderosa Pine existed due to the natural regime of frequent low and moderate intensity wildfire. Fire thinned out younger pine stands, and maintained the older ones. Frequent fires scoured the ground, killing off most fire-intolerant species. Years of systematic wildfire suppression, however—a wholly artificial regime imposed by humans—allowed fire-intolerant White Fir, Grand Fir, Bitterbrush, and junipers to invade millions of acres. These species are opportunistic colonizers in fire's absence. For example, White and Grand Fir reproduce more prolifically and grow faster than pine, and tend to out-compete pine for limited ground moisture. As a result, encroaching trees stress the large overstory pines, often leading to the decline of old-growth Ponderosa. Yet, fir often are not well adapted to the drier pine sites, and tend not to thrive. As dense thickets grow up around the dead and declining pines, the firs themselves often get hit by a combination of insects and diseases. Whereupon the stands unravel. In the absence of low intensity wildfire, this kind of forest dynamic—a better term might be devolution—spreads across eastside forests. In combination with increased ground fuels, such encroachment also greatly elevates the risk of catastrophic crown fire.

Beginning in 1976, the Park Service sought to ameliorate these conditions at Crater Lake NP by reintroducing fire under controlled conditions. According to fire expert James Agee, the program has been a success. However, it has not been without problems. With hindsight, it appears that the Park Service waited too long to reintroduce fire. Due to the high fuel levels, some of the prescribed burns in the Park exceeded the range of intensity experts consider desirable. Many large pines were killed during some of these prescribed burns, either directly, by crown scorching, or indirectly, due to fire-caused stress.

Trees killed by crown fire die as a result of what experts call crown scorch. This occurs when high heat or flames reach the crown of a tree and touch off its needles. Sometimes trees survive crown scorch, if light, but severe scorching, which is directly related to flame length, kills a tree. When flame length is insufficient to reach the crown, Ponderosa Pines and Douglas-firs, due to their thick fire-resistant bark, usually survive fires.



Douglas-fir

Flame length, in turn, is directly related to what experts call vertical fuel continuity. In historical park-like pine stands, the relative absence of combustible material between the forest floor and canopy kept flame length low. Fires burned near the ground. This was the historical pattern in pine forests across the region. With wildfire suppression, however, encroaching fir in formerly open stands vastly increased the amount of combustible material between the ground and canopy, and thus the risk of crown fires. Vertical fuel ladders can transform low intensity fires into catastrophic events.

Indirect mortality caused by fire-induced stress was also a problem with early Crater Lake prescribed burns. Experts concluded that some of the burns were conducted when ground moisture levels were too low, probably meaning spring burn-

illustration by Sandy Hogan

ing occurred too late in the season. Most of the prescribed burns at Crater Lake were conducted in late June, after ground moisture had already dropped significantly. When ground fuels are heavy, Ponderosa Pines can be weakened even by low and moderate-intensity fire. Even relatively cool smoldering burns can damage small roots and root collars. As ground fire smolders over a number of hours or days, sub-surface temperatures steadily rise. Eventually, heat transfer overwhelms the insulating capacity of bark to protect cambial tissue. Roots are damaged, leaving trees vulnerable to subsequent attack by various kinds of bark beetles. The obvious conclusion is that spring burning, where it is deemed necessary, should be conducted early in the season, when soil temperature is still low, before herbs and forbs have sprouted, and before trees have begun their spring growth cycle.

As the Crater Lake experiences are showing, fire reintroduction demands a high degree of skill on the part of fire crews. Moreover, when fir encroachment is advanced, no amount of skill can overcome the risks associated with fire reintroduction, without prior mitigation. This was confirmed in 1994 by Crater Lake officials who, after eighteen years of experience, reluctantly acknowledged the need to cut trees, i.e., to thin out the denser thickets around the bases of the old-growth trees, as a preliminary step to prescribed burning. According to Al Augustine, Crater Lake fire officer, the new policy went into effect last summer (1994). A portion of the fir understory was manually removed from areas slated for future controlled burning. Encroaching firs in the six- to eight-inch diameter range were cut, hand-piled on site, and burned in the fall. The approach will be used, as needed, to reduce vertical fuel continuity, and bring overall fuel loading down to where fire can be reintroduced safely. The thinning is labor intensive and expensive, but it works.

Restoration Tools

Fairly good agreement exists on the basic kit of tools available for restoration work east of the Cascades. The two tools most commonly referred to in the literature, and probably the most important, are 1) prescribed fire and 2) understory thinning, sometimes called "thinning from below." Though widely misused and over-used, salvage is sometimes regarded as a restoration alternative as well. Other restoration activities commonly mentioned in the literature include pruning, revegetation, sub-soiling (to treat soil compaction, though this remains controversial), biomass removal (to reduce fuel loads), road closures or obliterations, reintroduction of native species, grazing exclosures, inventories, data gathering, and monitoring. To this list I would add use of work horses as a benign alternative to tractors and skidders (Noss 1992, Coulter and Riverwind 1993, Schmidt et al. 1993).

LAKE CHELAN NATIONAL RECREATION AREA

Horizontal Fuel Continuity

Another problem associated with fir encroachment can be observed across entire landscapes. Formerly, the composition and structure of eastside forests were a mosaic of forest types, with multi-storied mixed conifer on wetter and higher sites, and fire-maintained park-like Ponderosa stands on lower and drier ground. This structural forest mix or mosaic incorporated fuel discontinuities not just vertically but also in a horizontal dimension, discontinuities that limited the size of crown fires. Historically, then, most crown fires in eastern Oregon and Washington were small. Large events were rare, as verified by a recent informal review of old fire records by FS plant ecologist Bill Hopkins (Hopkins 1993).

Fire suppression and fir encroachment reversed this pattern. Today's eastside forests are much more homogeneous, with more multi-storied stands and far fewer park-like stands. This accounts for the increasing size of crown fires in recent years. Where historical crown fires averaged in the tens or hundreds of acres in size, events nowadays often occur over thousands or tens of thousands of acres. Today, many eastside forests are fire storms waiting to happen.

The Lake Chelan National Recreational Area, administered by the National Park Service (North Cascades National Park), is presently grappling with this problem of horizontal fuel continuity. A "wildland protection and forest restoration project" there is in the later planning stages. According to Bruce Freet, NPS Chief of Resource Management, the project area is located in the Stehekin Valley, at the northwest end of Lake Chelan. The project area lies upstream from a small community of year-round residents at the mouth of the Stehekin River, where the river empties into the lake.

Formerly glaciated, the Stehekin Valley is narrow, with precipitous walls. It is heavily forested, with a mosaic of forest types. More than half of the lower valley's 4900 acres is mixed conifer. However, the valley also includes 1700 acres of scattered old-growth Ponderosa Pine growing as a co-dominant with Douglas-fir. Fire-scar studies show that the historical fire interval on these drier sites was in the range of 11 to 21 years. Throughout the rest of the valley a moderate intensity fire regime prevailed, with an interval of 25 to 100 years. The last significant wildfire in the valley occurred in 1890, with an earlier big burn in the 1790s.

Creating Fuel Break Zones

The problem is that successive waves of younger Douglas-firs have been encroaching under the pines since fire suppression began about eighty years ago. As a result, the pine component has declined, as the formerly open stands have closed in. The build-up of continuous fuels also is regarded as a threat to the nearby human community. The wildfire risk is made more serious by an unusual wind pattern in the Stehekin Valley: prevailing afternoon winds tend to push fire down rather than up the valley (Agee 1993). As explained by Freet, the fuel reduction project was conceived only as a last resort. A series of earlier prescribed burns did succeed in removing smaller firs, but not enough of the pole-sized trees to return fuel levels to within historic range. Though young Douglas-firs are killed easily by ground fire, they become fire resistant as saplings reach pole size. As at Crater Lake, National Park Service officials, who have no interest in selling timber, eventually were forced to concede that restoration would require cutting trees.

The project at Lake Chelan will call for understory thinning of about 800 acres. The objective will be to restore stands in six areas to conditions resembling what existed before fire suppression. No old-growth pines will be touched. No new roads will be built. The fir component of the stands will be thinned, particularly trees that have encroached since fire suppression. To ensure maintenance of the pine component, stands will be opened up enough to encourage pine regeneration. The agency is still investigating various low impact ways of removing the down timber to minimize soil disturbance. According to Freet, thinning and removal most likely will occur during winter months, with at least two feet of snow on the ground. Removed timber will be made available as firewood to year-round residents of the local Stehekin community. Material too small for firewood will be lopped and scattered on-site. Prescribed burning will follow. Long-term monitoring plots and controls will gather feedback useful in evaluating and further refining the project. Once fuel loading has been returned to historic levels, a maintenance burning schedule will be introduced, possibly involving random numbers to mimic a natural fire regime. (The proximity of the year-round Stehekin community prohibits a "let burn" wildfire policy in the area.)

The final EIS for the project, including an implementation plan, is scheduled for completion in late June 1995, with a decision expected as early as August. Implementation could begin soon thereafter. The Stehekin fuel reduction effort offers promise of being a model eastside restoration project, and deserves the support of environmentalists across the region.

BEAR VALLEY AND THE MATTER OF CRITICAL HABITAT

A third restoration project has been proposed by the US Fish and Wildlife Service, for the 4000 acre Bear Valley National Wildlife Refuge in south-central Oregon's Klamath Basin. In contrast to the other well-known federal refuges in the Klamath Basin, which are wetlands, much of Bear Valley is old-growth forest. The area features roosting habitat deemed vital to the largest concentration of Bald Eagles in the US south of Alaska.

Excessive fuel loading and severe fir encroachment have Fish and Wildlife officials worried. The area spans the gamut of eastside forest types, from juniper woodland on lower drier sites, old-growth Ponderosa Pine at slightly higher elevations, to mixed conifer at the upper range. Prescribed burns already have been applied over some 1500 acres, but encroachment is so advanced through the remainder of the area that FWS officials have decided that controlled burning, even under optimal conditions, is too risky. They concluded that mitigation in the form of preparatory thinning and removal and/or piling/burning would have to precede fire reintroduction.

The Bear Valley project, still in the early planning stages, offers an answer on the habitat question: Not only *can* forest restoration proceed without compromising habitat; in many cases, restoration will be essential to preserve habitat. WERF

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"Buffalo Commons"

An Encouraging Word

by Douglas Coffman

map by Chuck Ouray

In the late 1980s and early '90s, Rutgers University demographers Frank and Deborah Popper cleared big ground in America. Proclaiming the emergence of a vast Great Plains empty quarter (*Planning Magazine*, December 1987), the scholars ignited the gray stubble of old-frontier thought—burned it off, revealing a green uncharted land. This they deemed a new frontier—a "Buffalo Commons"—suggesting initially that the federal government "take the newly emptied Plains and tear down the fences, replant the shortgrass and restock the animals, including the Buffalo." As originally proposed, the essential task was "to restore large parts of the Plains to their pre-white condition, to make them again the commons the settlers found in the nineteenth century."

But the federal government has not come forward to actualize this audacious vision, and subsequent comments by the authors raise questions as to what they actually meant when they coined the Buffalo Commons metaphor. Deborah Popper recently explained: "We are talking about a largely small-scale, entrepreneurially inspired bison uprising that does imply more Buffalo ranching, more conservation projects, more ecotourism and more creative thinking than the Plains have seen in some time."

THE POPPERS HAVE succeeded in prying open the reluctant public mind, exposing it to their fertile, if uncultivated, vision. As scholars, though, they have sidestepped advocacy, often withholding judgment on the shapes their idea takes as it is tugged and pushed toward reality. To say that the Poppers have promised a new frontier without actually defining it, or showing us exactly how to get there, is not to fault them. Rather, it is to highlight the difficulty of finding the way ahead.

Buffalo Commons is a lush, tantalizing idea. Essentially it is virgin territory in the "geography of hope." But by releasing their searing vision into a regional climate of uncertainty, even despair, the Poppers may be placing its fate in the wrong hands. That the dreams of capitalists drive the nation, not those of academics or struggling agriculturalists, is no mystery. For the money-makers, rumblings of a Buffalo Commons were quickly perceived as the sound of opportunity knocking.

Times have changed, of course, since earlier enterprise overran and destroyed the natural wonders of past frontiers. But our national psyche and extractive economic system have not changed much over the past century or so; and markets remain characteristically "blind" where the better interests of people and land are at stake. Because socioeconomic inertia will continue to impact Plains developments, caution is prudent. We must not assume that a hollow icon like Buffalo Commons will somehow inspire the social responsibility and environmental altruism of all those who would promote it. As the corporate wheels get rolling on the new frontier, it may be difficult to avoid another market-driven feeding-frenzy, with bison as the entrée.

If there is danger in corrupting the wild image of a Buffalo Commons, then there is danger to the Buffalo themselves and their Great Plains landscape as well. As a "keystone" species in the Great Plains, American Bison evolved with and are organically linked to numerous other species of the prairies. The well-being of a broad range of interdependent animal and plant species rises or falls with the shifting fortunes of the bison.

The unique hardiness and adaptability of bison enabled our own ancestors to endure the rigors of ice ages, dispersing with the large bovines throughout northern Eurasia and North America. Bison, humans, and grasslands have been closely linked in an epic of global survival for 100,000 years or more. Artful renderings of bison and other grazers on cave walls in Europe attest to this vital union. Only relatively recently have bison been pushed from our lives.

illustration by Peter Lucchetti

Unfortunately, recent developments would suggest that we are drifting toward an era of private bison ranching, not the holistic renewal envisioned in Buffalo Commons ideals. Commercial bison ranching is geared to short-term ends: exploitative, single-species production, rapid extraction of biomass, enhanced profits for those who would harness wild species to human desires. The process is industrial, not ecological, and is chronically subject to the demands and uncertainties of the marketplace. Furthermore, in order for bison ranchers to meet their objectives, herds must constantly be medicated, managed, and otherwise manipulated against their wild inclinations. As their behavioral and reproductive repertoires are thwarted, bison are put at risk.

Theoretically, we may be able to grow a bunch of Buffalo on a ranch pasture...for a time...just as we might grow a bunch of firs or pines on a tree farm. Try as we might, though, we do not produce a genuine bison herd any more than we create an old-growth forest. Trees, salmon, bison whatever—industrial monocultures of any species simply do not work well in the long-term biological sense. With bison, especially, the organic complexity and vast scale of their native habitat cannot be approximated within the confines of a commercial operation.

It is profound ignorance, then, a social alienation from organic entities such as bison, that causes us now to grasp at ranching as a panacea, while ignoring the long-term plight of prairie species. The natural history of the Great Plains hides like some elusive "dark matter"; though it remains invisible to the eye, it is the very stuff that holds the world together. When we acknowledge bison as a unifying strand in this living tapestry, a troubling fact emerges: wild bison are essentially extinct in this country today. The species has been *reduced* to a state of semi-captivity. The primal American beast is now hostage to our technologic age, yet the public is unaware of the problem.

So far we have addressed only the "Buffalo" part of a dual aphorism; the "Commons" part also is problematic. The term sets land-ownership against common-use on the Great Plains, calling current land-use practices into question. Ownership, dry-land farming, private livestock ranching and other uses all become instantly controversial in the Buffalo Commons purview. History tells us why.

Today's uses of arid Western rangelands stem directly from the Homestead Era—a defining period in the late-19th and early-20th centuries. At that time, passage of several Homestead Acts created a frontier, pitting Plains settlers against the open range with the promise of ownership. Because the acts were unrealistic in the first place—out of touch with harsh realities of climate and landscape—they set the stage for cycles of misery and destruction. Subsequent attempts to fine-tune domestic Plains uses under the private ownership system have fallen far short. Continuing disillusionment and failure in the dry lands are signs

that the ghost of the homesteader is with us still. To this day, his star-crossed plan dogs the Plains dwellers, locking them in a futile struggle against the environment.

Like the "Buffalo" part, though, the "Commons" problem is not necessarily insurmountable. Land-ownership, competition, and rugged individualism are rampant in today's free-enterprise system, but cooperative rangeland institutions also have been part of the Western heritage from an early date. Even before bison completely vanished from the Plains, in the 1870s and '80s, cooperative grazing of cattle on vast short-grass ranges was in full swing. In the days of the open range, two or more ranches would run stock in the same area, cooperating in semi-annual roundups. Oversight of stock-sorting and ownership disputes was handled by representatives from each participating ranch. Eventually, stockgrowers' cooperatives arose to manage the larger affairs of the dry-land endeavor. This common-sense plan allowed stockmen to graze more animals over larger areas than they could possibly have fenced and controlled alone. Exclusive ownership of lands was unnecessary, since use alone served to establish access, and the benefits accrued to all. There is valuable precedent here. What was the open range but a vast commons, albeit one grazed by the wrong bovine?

Today, ways of adapting to native plants and wild animals as an economic base will be somewhat different from those used on the open-range, but the clear advantage of cooperation remains. In the harsh environment of the High Plains, cooperation earns success. Had bison, rather than cattle, been the animal of choice back in those early days, an enduring way of life might well have emerged. As it was, exotic (imported) cattle were a weak link in the open range system; they could not withstand the rigors of the Plains without costly human interventions. Droughts, hard winters, greed, and plunging markets broke the back of the open range. In the end, the land itself was broken and fenced.

Not even homesteading, though, could break the compelling story of the open range. It pulls at us today through futuristic visions like Buffalo Commons, evoking a wilder past.

The Poppers' vision, of course, is not just a story; it is the bright wild-side of the American Dream. And at this place in history, it should be obvious that perpetuating dysfunctional dry-land models with private bison ranching or tourism is merely a prescription for continued failure. To avoid this pitfall, we must proceed on the basis of adequate diagnoses of our historical ills. The causes lie largely within ourselves—in the failure to incorporate geographic reality as a guide to socio-economic development. Fortunately, crisis brings corresponding opportunity. On the Great Plains, the need for comprehensive, biologically-based planning affords people a unique chance to seize the future by reintegrating their lives within a restored biome.

As with ecosystems, our own human prospects for lasting success in agriculturally marginal lands hinge upon integrity. In the vision before us now, "Buffalo" and "Commons" must be kept together—unified, understood, and implemented as interactive parts of a practical unit. This is the large pill, as it were, which must be taken whole if it is to have the desired positive effect. Splitting the metaphor (as some current developments threaten) is splitting the world itself: bad medicine for an ailing land. Restoring free-ranging bison and their associates to the common ranges that generated and sustained them must be the paramount objective of the Buffalo Commons program. If not, Buffalo Commons becomes simply one more euphemism for "business-as-usual."

Fortunately, there are already signs that the Buffalo Commons is a healing vision. Bison and native animals and plants of the Plains retain much of their innate vigor to this day. Bison are proving themselves among the most resilient of North America's native grazers. Biologically-speaking, chances for their wild resurrection remain good.

On the human side, much is now being done locally in the Plains by way of bison conservation and habitat renewal. To restore and safeguard the native biodiversity, though, the stranglehold of strict land-ownership must gradually be relaxed. Far from signifying failure, easing our death-grip on the dry plains will greatly enhance the natural productivity of the landscape, thus improving long-range prospects for social and economic renewal.

The Buffalo Commons vision shows us the continuing hope of the dry Great Plains. There is still a chance in that rugged, rolling heartland to find a life that works; but no one should suggest this will be easy. Buffalo Commons presents real challenges to our national psyche. It presupposes vision, sensitivity, and awareness in our relations to the land and to other life forms. It requires coherence and comprehensiveness of thought and planning. It demands wisdom and restraint in our social and cultural development. Above all, it implies cooperation among people, and reciprocity between humans and the rest of the natural world. Buffalo Commons portends nothing less than a return to Nature.

A Buffalo Commons must be founded upon a holistic model, involving large-scale ecological restoration. Nature must be the chief architect, of course, but will do the job right only if left alone to do most of the carpentry as well. Humans might just stand and watch much of the time, though they too can be kept busy mitigating ravages of the past century, while inventing new lifestyles for the next. In this way, the transition to a cooperative, wildlife-based economy will occur gradually as the pace of restoration and the growth of grasses and wildlife populations permits. Institutions, lifestyles, and amenities will come in time—tailored to the awakening landscape.

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Befriending a Central Hardwood Forest

Part 3 of 4

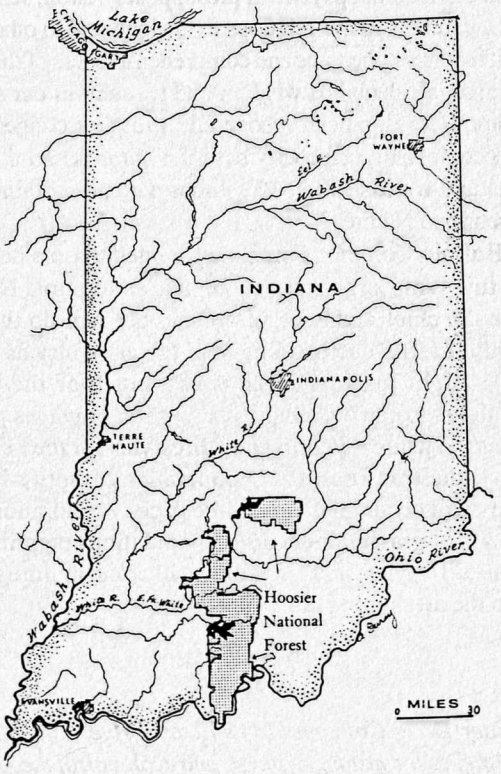
by Sidney Collins

INTRODUCTION

Patched into the unglaciated hills of Indiana, a legacy of Northwest Ordinance grid mapping, the blocky sections of the Hoosier National Forest go tumbling through nine counties down the south-central part of the state to the Buzzards Roost bluffs looming over the Ohio River. Though oversight now is shaped by the rubric "ecosystem management," Hoosier citizen/scientists are, once again, legally challenging Forest Service decisions: to clearcut erosion-control pine plantations, and to "restore" the dry forest communities through prescribed burns.

Seeking intimate knowledge of the historical forest, the writer, in Part One of the story, sought out an Indiana University archaeologist and went time-tripping through the centuries—from the tree-felling pioneers who broke treaties with the Shawnee, Potawatomi, and Miami tribes back to the post-glacial paleo-Indians who retooled their spearpoints at outcrops along the Ohio River. Over three hundred and thirty known historic and archaeological sites and structures exist on Hoosier National Forest lands.

In Part Two, using a centuries-old white oak ("wide as a Volkswagon") in Pioneer Mothers Memorial Forest as an emblematic anchor, the writer and her friend, an amateur mycologist, engaged their Forest Service guide in an exchange about the Swiss cheese configuration of the forest. They were left leery of just how much of the Hoosier will be allowed to grow into big trees.



IF THE WOODS ARE BEREFT of the big animals conservation biologists call charismatic megafauna, or top predators, then what is left to defend out there? A great many creatures, actually, but perhaps most noticeably the neotropical migrant birds, the bright little songbirds: warblers, vireos, thrushes, swifts, tanagers and flycatchers of dozens of species that breed in the United States and Canada and winter in Latin America and the Caribbean. As Indiana University biology professor Donald Whitehead puts it: "They have Indiana birth certificates but they pay taxes and have license plates that represent Costa Rica, Venezuela and other places," a comment that catches a professor being humorous and suggests a pronounced human tendency to anthropomorphize our fellow animals.

Whitehead has been running neotropical migrant bird research projects in the vicinity of the northernmost section of the Hoosier, the Pleasant Run Unit, for several seasons, their range and sophistication dependent on students, dedicated volunteers and whatever funding he is able to scrape together. Basic conservation ecology, he says, gets done on a shoestring. Molecular biology—the dance of the DNA—is ever the more alluring field.

Early last spring, on a pale-sun frosty Saturday, I went out with Whitehead, his wife Betsy, and a small company of avid birders hoping to see returning songbirds scouting for mates, since the males and females migrate separately. We first trekked around man-made marshes in eastern Monroe County where the Indiana

Department of Natural Resources has constructed hunting grounds for the Iron Johns who spill out of the cities in autumn to blaze away at feeding ducks. Only secondarily are these marshes a place where binoculars yield more diverse bounty than shotguns. This water was pooled for duck hunters. We trained powerful telescopes on grebes, Redwing Blackbirds, three kinds of swallows, assorted herons, a sandpiper—birds on the wing and birds on the water.

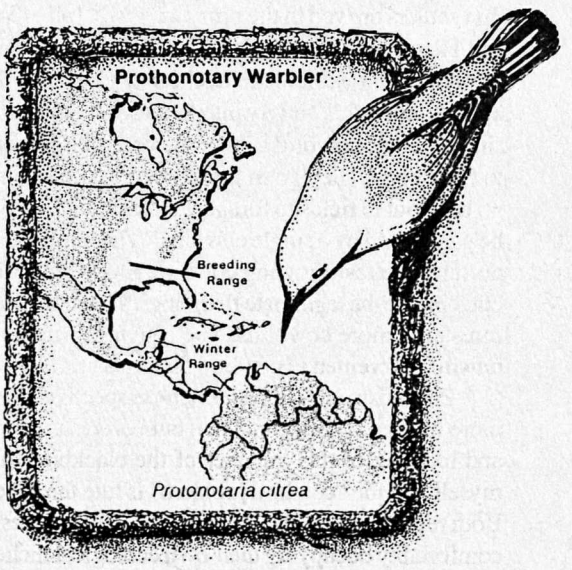
For more shelter and more trees we wound along a creek whose banks were set about with big black plastic puffs, garbage collected by an Audubon Society cleanup crew the day before. Whitehead had the spring song of the Prothonotary Warbler (the name is bigger than the bird) on a tape recorder. As I meditated on the confluence of birds and communications technologies we were suddenly buzzed by two male Prothonotaries, feisty little nuggets of gold-burnished feathers and spring mating song. One bird lit on a branch three feet away, squawking at the competition on the tape recorder. "There," said the birding professor with a grin, "is that a close enough look at the Prothonotary for everybody?" Yes, it was close and it was a thrill, conferring that rare present-at-the-creation ambiance. That's why we all got out of bed that morning—expecting the sweet stun of creation!

Seeing the mere ounce of singing warbler and knowing the distance it had covered to rendezvous with a mate made my throat catch. I marveled at the little bird's brave beauty. Dispassionate readers may now make whatever dull remarks they wish about humans who anthropomorphize animals. I have only recently paid attention to creatures on the wing. It was my brother who kept binoculars on his windowsill. I preferred plants. They didn't get up and move around, nor did they make noises that required identification.

But I've succumbed to the fascination of the songsters whose music fills the woods each May. They are, says David Wilcove of the Environmental Defense Fund, the birds that bird watchers adore. "Each bird is a curious mixture of strength and fragility," he writes in *Nature Conservancy* magazine in January of 1990. "Evolution has crafted a little machine so powerful and so sophisticated that a warbler born in New Hampshire in May will find its way to the Yucatan Peninsula by September without experience or guidance. Yet this same feat gives it a very tenuous existence, for its survival is now inextricably linked to the survival of a chain of forests extending from New Hampshire to Mexico." In the same article, Wilcove discusses why many songbird species are declining.

The bad news about songbirds has been accumulating for years. John Terborgh, professor of biology at Duke University and author of *Where Have All the Birds Gone?*, estimates that there now are one quarter of the number of neotropical migrant songbirds that were present in pre-Columbian times. Bird watchers, of course, knew the numbers were down before scientists began to conduct detailed studies. Wilcove says the old timers were always complaining that the migration just wasn't what it used to be. He thought the elderly birders were suffering the infirmities of age until he conducted his own research in Great Smoky Mountain National Park and in rural and suburban Maryland. Even in the neighborhood of The Nature Conservancy headquarters, at two green-island parks in Washington, D.C. where dedicated bird watchers have been counting breeding birds for 30 years, the results are disheartening. The decline in numbers is a result of the steady gnawing away at that chain of forests extending from the temperate zone to the tropics, explains Wilcove.

The birds' decline has sparked the formation of Partners in Flight/Aves de las Americas—a rescue initiative coordinated by the National Fish and Wildlife Foundation from Washington, DC. It appears that just about every



map and illustration by Chuck Ouray

private conservation and government natural resource agency has signed on, including the US Forest Service, in what is supposed to be a huge cooperative effort to maintain populations of forest and grassland neotropical migrant songbirds in the Americas. [See Rick Bonney's article "Partners in Flight" in *WE* spring 1993.]

Don Whitehead's interest in migratory birds on the Hoosier National Forest precedes the Partners in Flight initiative. His avocation embroiled him in the public controversy surrounding the 1985 HNF management plan. "In the absence of data," he explained, "anybody could say anything they wanted. What we needed was a data base relevant to the Hoosier National Forest itself." He testifies to the "enormous" body of literature on songbird declines indicated by US Fish & Wildlife Breeding Bird Survey data sets, on declines in forest fragments, and on fragmentation's effects. All of that was absent from the 1985 plan, so Whitehead set out to correct the dearth of information. Season by season he has been expanding knowledge of the neotropical migrants in Indiana, always with the help of students out in the woods.

Every fall Whitehead gives what I call "Don's Bird Show," on the Indiana University campus, to recap what he calls "a major North American biodiversity issue," and to share the data sets of the just-ended research season. Along with the portrait gallery of birds supplied by the Cornell University Ornithological Lab is a growing collection of photographs from our own forest. Here's a shot of a mother Acadian Flycatcher feistily attacking the motorcycle mirror hoisted up to peek into her nest fifteen feet off the ground in the fork of a limby young beech. "She rode the mirror all the way down to the ground," says the still astonished professor—proving that the little birds can be hilarious as well as heartrending. Here's a picture of a nest loaded with the eggs of the Brown-headed Cowbird, an "obligate brood parasite" that is a bane to songbirds in perforated forests.

"There were probably no cowbirds in Indiana when the first settlers arrived in the primeval forest full of Wild Turkeys and Passenger Pigeons and Peregrine Falcons," explains the professor. "Now there are buckets of cowbirds. They feed in agricultural fields and fly into the forest to dump their eggs. A single female cowbird in a single breeding season can lay up to forty eggs. They go in first light of morning, lay eggs, and go back out to fields to forage. So that means forty nests could be parasitized by a single cowbird." The mother bird tends and nurtures the fast-growing cowbird young, who outweigh and outcompete the legitimate fledglings. The more fragmented the forest, the more cowbirds. The songbird parents become the unwitting foremen in cowbird factories.

Parasitism is, from a human perspective, one of nature's more unattractive phenomena; but before succumbing to fear and loathing of this member of the blackbird tribe I remind myself that the "cowbird problem" is like the "deer problem." Both represent the false attribution of imbalances to creatures comfortably occupying their own ecological niches till sprung loose by humankind colonizing the continent. Cowbirds followed Bison and other grazing animals around the grasslands of the mid-continent before the coming of the Europeans. When the forests were cleared for agriculture, cowbirds attached themselves to livestock. Expansion of their range betwixt and between patches of forest brought them into contact with their preferred victims, the neotropical migrant songbirds. To a cowbird, cleared forest looks just like prairie.

A Landsat map makes it apparent that the Hoosier is patched into an area that has some of the most extensive forests in the Midwest. It is chopped up—clearcuts, wildlife openings, water holes, roads, trails, pipelines, power lines—but not chopped as badly as, say, the Shawnee National Forest in southern Illinois which has been proven a population sink for songbirds. The birds appear there but nests are so heavily parasitized by cowbirds and raided by predators that too few young are raised to maintain a stable community. "If in fact the Hoosier is an important source area," explains Whitehead, "it can be managed as such rather than managed as it has been in the past—for turkey, deer, grouse, squirrels..."

Forest Service wildlife management has been defined by its practice of stocking the woods with "game" species, a sop to the hunting lobby. This has included excavating waterholes on the ridgetops of the hill country and maintaining the forest in a configuration resembling Swiss cheese. Whitehead's research goal is to gather the data that tell how the disturbance mosaic imposed on the forest affects the distribution and abundance of the neotropical migrants.

The "holes in the forest" issue is at the heart of every appeal environmentalists file. The highest breeding bird diversity is associated with the areas that have the most extensive forest, "and that isn't the least bit surprising," says Don Whitehead as he puts up the slide of Indiana that proves the point by showing where Indiana birds survive.

Wildlife managers have said clearcuts are good because they promote habitat heterogeneity and you get high densities of birds in young clearcuts. This is called an edge effect. Forest Service officials have extolled clearcutting as a management technique for diversity in bird and game species. Even after exposure as a thinly-disguised justification for clearcutting, the edge effect business remains deeply entrenched in the Forest Service, thus its penchant for perforating the forest. Openings are justified, Lloran Johnson believes, because they provide habitat for mammals, and not just game mammals.

As knowledgeable observers point out, though, practically the whole state is edge habitat, and the opportunity for protecting large contiguous blocks of mature closed canopy forest is on our public lands. Many birds frequent the young cuts, but Whitehead's research has shown that it takes far more than twenty-five years of growth before a site becomes hospitable for nesting to others of the songbird guild. Although "upland game" species are well-provisioned by the holes in the forest, the songbirds are made vulnerable by the cutting.

Creatures who are pleased to prey on the songbirds congregate thickly in and around the edges of the openings: Bluejays, squirrels, crows, Raccoons, chipmunks, Opossums and Black Ratsnakes. Their predation now takes its toll on the birds well within forest patches.

Neotropical migrant birds are voracious consumers of insects; hence, they are integral to their ecosystems on both the North American breeding grounds and the tropical winter homes. In the north, the songbirds arrive hot on the heels of the springtime insect hatch, gobbling up the bugs that are feeding on new leaves. Sixty percent of breeding bird species in Indiana woods are songbirds and they comprise about eighty per cent of the individuals. Breeding bird communities in Eastern forests generally are dominated by neotropical migrants: over one hundred passerine birds (plus a score or so of raptors), intrepid little feathered packets who survive the rigors of migration only if they are able to put on enough body fat to make the trip.

While Whitehead is willing to make recommendations to the Forest Service about management for the neotropical migrants as a guild, he is also tirelessly gathering data so that he can specifically describe the factors influencing the birds' breeding success. He stresses that there are sharp year-to-year differences, in climate and in the numbers and activities of cowbirds, for instance.

I arose one morning this summer before dawn and went with Don Whitehead's team to the Pleasant Run Unit. I'd follow Beth Geils, whose research project will determine what the Acadian Flycatchers are eating off the flying and crawling insect smorgasbord. Earlier this century, the US Biological Survey had tried to determine this by putting out a call for birders to shoot a bunch of birds and mail their stomachs in to the lab. "Of course," she explained, "the stomachs kept right on digesting so that by the time they arrived the only contents were crunchy bug outsides." I saw Wordsworth's words on the page—"We murder to dissect."

> One impulse from a vernal wood
> May teach you more of man,
> Of moral evil and of good,
> Than all the sages can.
>
> Sweet is the lore which Nature brings;
> Our meddling intellect
> Misshapes the beauteous forms of things—
> *We murder to dissect.*

American Goldfinch (Carduelis tristis), *watercolor by Robert M. Smith*

Who wouldn't blanch at an account of gunpowder blast turned on the chirp-and-whistle of songbirds?

Beth's methodology is more benign. We wind and clamber through three ravines where no trees have been cut since around 1900. The appearance suggests forest rather than woodlot because of the steep-sided ravines, ephemeral creek, big trees, tropical melon color of chanterelles pushing up on the forest floor, shades of tree green and the play of light and shadow. It's typical Indiana summer weather—steamy and hot—and we get drenched making the rounds of Beth's bug tents, all three labeled with patches that read: Research Site—Breeding Bird Study—Directed by Indiana University—in cooperation with the US Forest Service, Indiana Dept. of Natural Resources.

The insect abundance project is actually one facet of a larger investigation into the microclimate of the birds' nesting neighbors and regional weather affecting Midwestern forests. Whitehead says, "It is tempting to suggest that lower humidity and higher temperature in 1994 may have been in part responsible for lowered food availability and this, in turn, might have contributed to the lowered observed productivity of the Acadians." Do moist, cool forests make for maximum bugginess and plump, amorous birds? To date, it seems so on the Hoosier.

If you've been camping you know it seems as if every bug in the woods wants to get inside your tent. Pitched in the flying phantasmagoria of bug space, Beth's tents intercept whatever flies by as effectively as a camper's temporary shelter does. At the top of each tent is a Rube Goldberg device (impossible to describe but clear evidence of Beth's field biologist ingenuity) that collects a random sampling of our winged brethren who enter the tents from early evening until she dumps them the next morning. The bugs go back to Jordan Hall to be identified by a high school biology teacher from Indianapolis. One of each kind of bug, including the striking tiger beetle clothed in a flash of teal iridescence set with six salmon pink spots and the chubby cicada with netted lace wings, have landed in a 4-H glass-lidded box—the naturalist's field memorabilia. Beth thinks the Acadians are dining mostly on caterpillars; she reached this observation after looking at four hundred leaves and counting the crawling residents.

I am in the company of a student pursuing a doctoral degree who has grown, in her own words, "bird wisdom." "You develop a sense of the sort of place the Acadian will build a nest. If I were a bird," speculates the former teacher, arms akimbo and facing a young beech tree, "this would look good to me." And all the time she is listening to the calls of the males and females. Last summer the students found over seven hundred nests. This year it topped a thousand. Sleuthing out nests leads to bird wisdom and bird wisdom leads to an acuity in sleuthing out nests. A natural feedback loop.

This kind of close field work is, as Whitehead describes it, "unbelievably labor intensive." This summer, for the first time, Beth has videotaped an Acadian nest and hopes, by enhancing the film, to see what the parents bring in to feed the young. Mention of the camera involves us in a conversation about the "ecologically correct" or unobtrusive approach to gathering data on what Beth calls "the lifeway of the birds." There has been much discussion in the Whitehead lab, as well as a study designed to analyze the effects of their field work. "Our simple presence," she muses, "how much does it affect the birds?"

"I'm not nearly as concerned about the issue now as I was initially," she confides. "I've fallen asleep out here under the trees and when I awakened the birds were flying all around my head. The landscape gets constantly rearranged. Limbs fall from the trees. As for the camera—it's inert. What gets the birds berserk is owls in the neighborhood. Their instinct for the natural predator is unerring." Nobody is shooting birds for their stomachs on the Pleasant Run unit and the birds aren't abnormally skittish of the flocks of student scientists. The students speculated that predators, Raccoons or Opossums, might track human scent to the ground-hugging nests of some birds; but the students have criss-crossed the ground in so many directions there's really not a discernible trail. As for the snakes and jays who prey on the higher nests, human trails are irrelevant.

Even with the students carefully out of the prey/predator loop here, nature, as Tennyson famously opined, is red in tooth and claw in its more strenuous manifestations. In the vicinity of the Pleasant Run Unit, under natural conditions, when birds nest in the forest interiors, the rate of nest predation is over fifty percent anyway, according to Don Whitehead. And that has nothing to do with edge or fragmentation. When such anthropogenic disturbances are present, the rates soar.

One reason for the neotropical migrants' vulnerability is the fragility of their nests. Kids are always dragging bird nests to show-and-tell at schools and most of them are from big burly birds who use a mud, plaster and wattle construction that is sturdy as a brickbat. With these little songbirds, in contrast, it is as though migration siphons off their energies and they are too spent to devote themselves to architecture. Acadian Flycatcher nests have see-through bottoms; Red-eyed Vireo nests look like half a baseball cover. Beth tells me she watched one Acadian mother construct a scanty and pathetic nest then stomp up and down in the middle of it. The open weaving held, so not one more blade of grass did she add. A story both amusing and touching. That many of the songbirds build their cuplike nests close to the ground makes them easy pickings for marauding passersby.

Beth mentions a branching out of the Whitehead lab research. This is all applied ecology, designed to answer questions that will enable the Forest Service to develop ecologically sound management plans, or "management prescriptions" in the jargon. Birds have genetically distinct family lines and home territories, as salmonids have home streams on the Atlantic and Pacific coasts. So when the students run mist nets to count and band the birds, they nick the birds' legs and draw a pipette of blood for DNA sampling. The samples are sent to a lab in Missouri.

A genetically diverse population in a ravine—a small-scale landscape—indicates the presence of "immigrants" who have flown in because of a high risk of failure in their home territories. Unfortunately, they may be equally at risk in adopted territory. In the best of all possible worlds, in the relative safety of unfragmented forests, the birds are faithful to the site of their fledging; the males and females come back year after year, and reproductive success is high. Beth says they even recognize the familiar song of old neighbors. Keeping breeding business all in the family in a given ravine translates into genetic homogeneity. To find otherwise is to know that the birds are scrambling for safe nesting sites, in unfamiliar territory and in the company of strangers.

"This could have a big effect on how to manage the forest," says Beth. "It looks like we need a lot of forest to protect the family lines." As with the salmon, whose distinct genetic lines are called races, the loss of a branch of the family means the disappearance of that family's genes—a loss of diversity.

Another threat to songbirds is the gypsy moth which is hovering up there on the Michigan border ready to consume the central hardwoods. The insect strikes such fear into the Forest Service that they have laid plans for "preemptive cutting" to beat the moth to the trees. Beth thinks that the Acadians eat mostly caterpillars, so a decision to control the moth chemically would necessarily affect the birds.

Beth says the birds made nests this spring with equal enthusiasm in the forest interior sites, in the sites close to agricultural fields, and in the forest around a ten-acre clearcut. The success rate for fledglings was high in the interior, whereas nests in the other two contexts suffered frequent predation and cowbird parasitism. In the summer of 1992 Whitehead found a "very unexpected landscape pattern." He expected nests adjacent to the agricultural fields to be more heavily compromised than those around the clearcuts, but just the opposite situation obtained. Life for neotropical migrants appears to be dicier if they build their nests anywhere around clearcuts. Summer 1994 observations strengthened the initial findings. Cowbirds congregate in interior forest openings and before the first light of dawn they fly into the forest to court, search for new nests, and drop their eggs. Increasingly, then, Whitehead's research is shaping an indictment of the Forest Service's maintenance of a scattershot pattern on the Hoosier National Forest.

Sidney Collins (323 N. Hillsdale Dr., Bloomington, IN 47408) recently earned a masters degree at Indiana University to celebrate turning 50. She was present at the creation of Heartwood and serves on the Protect Our Woods board. She has two grown kids, and credits her treehugging to her own mother.

illustration by Gary Bentrup

It Springs Without a Name

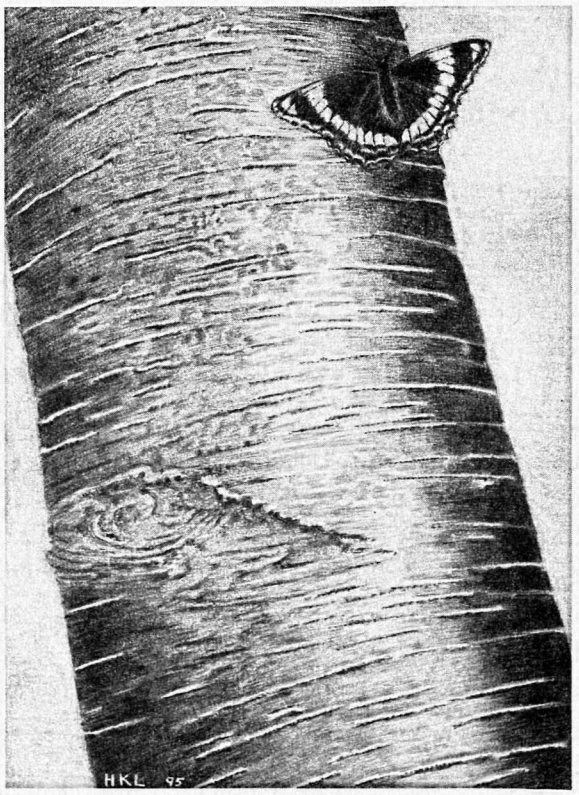
Elderberries overhang gray-blue
like a thought of smoke toward fall
where a snow-fed spring seeps out.
Much lower, it becomes a creek
without a name, crossing a track
just dotted on the map. They both
wind down, the water gathering
branches; the road collecting
cars and billboards, snags
at the county seat. At last
road and river level out
to floodplain, where we're amazed
the water's caught so much of us
in its current, along its banks.
Styrofoam and tennis shoes.
Down here it smells so human,
we give it a name on the map.

—Taylor Graham

The Black Birch

Betula lenta

The eastern United States is blessed with several tree-sized members of the birch family. The more common ones bearing the birch name are the White or Paper, Yellow, Red or River, Gray, and Black or Sweet Birch. A variant of the Paper Birch is the Mountain Birch (*Betula papyrifera* var. *cordifolia*), which some botanists consider to be a distinct species. For some of us, the Paper, Yellow, and Black Birch capture the essence of the middle and northern latitude woodlands. The forest would seem incomplete without them. I was torn on which to choose for this article. My obsession with large trees tempted me to choose the Yellow Birch, which can reach huge proportions in the Northeast and in parts of the Southern Appalachians. I even thought of tackling the entire group because of the novelty of the color scheme; i.e., white, yellow, red, gray, and black. Oftentimes, names of colors given to tree species such as black, as applied to oak and maple, or yellow, as applied to pine, are of little value in tree identification. Not so with birch. All the colors have meaning, particularly white, yellow, and black. My dilemma ended when I retreated from the group and chose to write about a member of the birch family that gets little attention these days from tree lovers, *Betula lenta*, the Black Birch.



bark of young Black Birch with White Admiral butterfly

by Robert Leverett
illustrations by Heather K. Lenz

Like most trees, *Betula lenta*, is known by several common names: Black Birch, Cherry Birch, Sweet Birch, and Mahogany Birch. In the Southern Appalachians, *Betula lenta* is sometimes called mountain mahogany. A seldom used name is Checkerberry Birch. *Betula lenta* is arguably the most enigmatic of the birches in that today few people have knowledge of the historical uses of the species and even fewer see Black Birches at their best development. It is time to bring this splendid member of the birch family back into public consciousness. Let's begin by considering the tree's physical characteristics.

SHAPE & SIZE

The Black Birch is a fairly symmetrical tree when young to medium-aged. As with most tree species, old birches lose much of their youthful symmetry. Tree guides typically describe the Black Birch as a medium-sized tree from 1 to 2.5 feet in diameter, rarely over 3. Maximum heights are usually given as 70 to 80 feet, occasionally taller. In contrast to many size descriptions given in the guides, the description for Black Birch is

fairly accurate. However, on highly favorable sites, *Betula lenta* can exceed 3 feet in diameter and grow beyond 100 feet in height. The national champion Black Birch, a New Hampshire tree, is 4.8 feet in diameter. The largest measured Black Birch in the Great Smoky Mountains (another Will Blozan tree; see "Will Blozan and the Big Trees of the Great Smokies," *Wild Earth* summer 1995 and "Big Tree Update" this issue) is 13.4 feet in girth (or 4.27 feet in diameter). Other large Smoky Mountain birches are more on the order of 8 to 10 feet in circumference. However, birches up to 6 feet in diameter were reported in the past (Coker and Totten 1934, in *Trees, Shrubs, and Woody Vines of Great Smoky Mountain National Park*, by Arthur Stupka, University of Tennessee Press, 1964). No locations were given for trees of such improbable dimensions. In addition, a word of caution about trees listed in the National Register of Big Trees maintained by American Forests. Some of the trees are multiple-stemmed. These coppiced individuals may have grown back from the stumps of cut trees and hardly reflect worthy entries for the species. I have no knowledge of the New Hampshire specimen, but I hope it is not multi-stemmed.

BARK

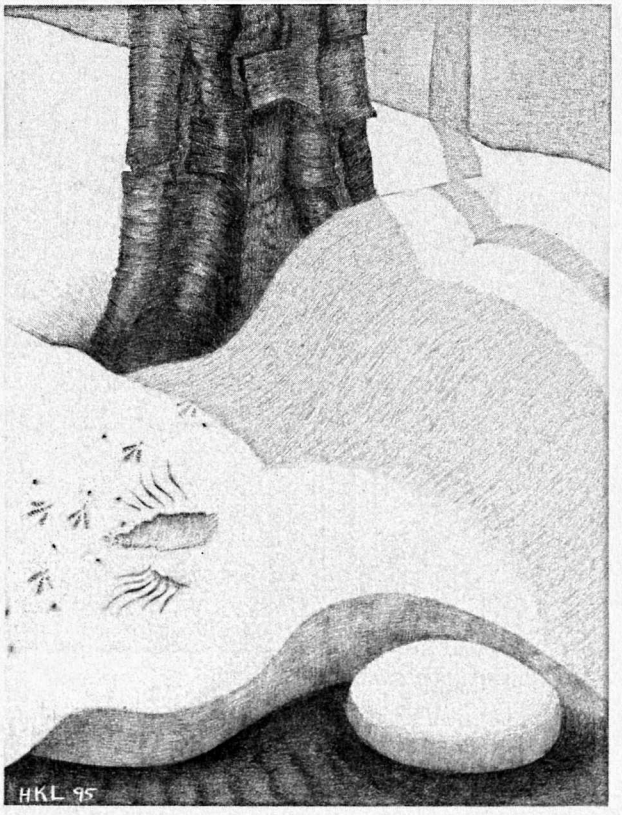
The Black Birch's bark is fairly distinctive, ranging from dark brown to black sometimes with a reddish tinge. Young bark is smooth, lustrous, and exhibits horizontal lenticels. Old bark is furrowed and broken into irregular plates, which eventually slough off if the tree lives long enough. One source describes the Black Birch as not shedding its annual layers of dead bark as the other members of the family do. However, the bark plates become increasingly fragmented with age, breaking into smaller and smaller platelets until the birch sometimes is mistaken for Black Cherry. The outer bark weathers into a lighter color, often appearing gray, which has led some to confusion. The name Gray Birch has even been applied to the Black Birch. In truth *Betula lenta* looks nothing like *Betula populifolia*. Nor does the bark of the Black Birch ever separate into thin layers as with the Paper Birch. The inner bark is a rich source of the oil of wintergreen. In this respect Black Birch is unmatched by any other species, although the twigs of the Yellow Birch also contain the fragrant oil.

WOOD

The heartwood of the Black Birch is often described as dark brown with a tinge of red. The sapwood is light brown or yellow and is heavy, strong, hard, and close-grained. Black Birch wood has very small, inconspicuous medullary rays and darkens on exposure to air. It has been passed off as Honduras mahogany. Despite the quality of its wood and its important historical uses, Black Birch is not considered a highly valuable commercial species.

LEAVES

The leaves of the Black Birch are alternate, 2 to 6 inches long and 1 1/2 to 3 inches wide. As with many species, large leaves are on the young trees which tend to maximize surface leaf area in the understory. Leaves vary from ovate to heart-

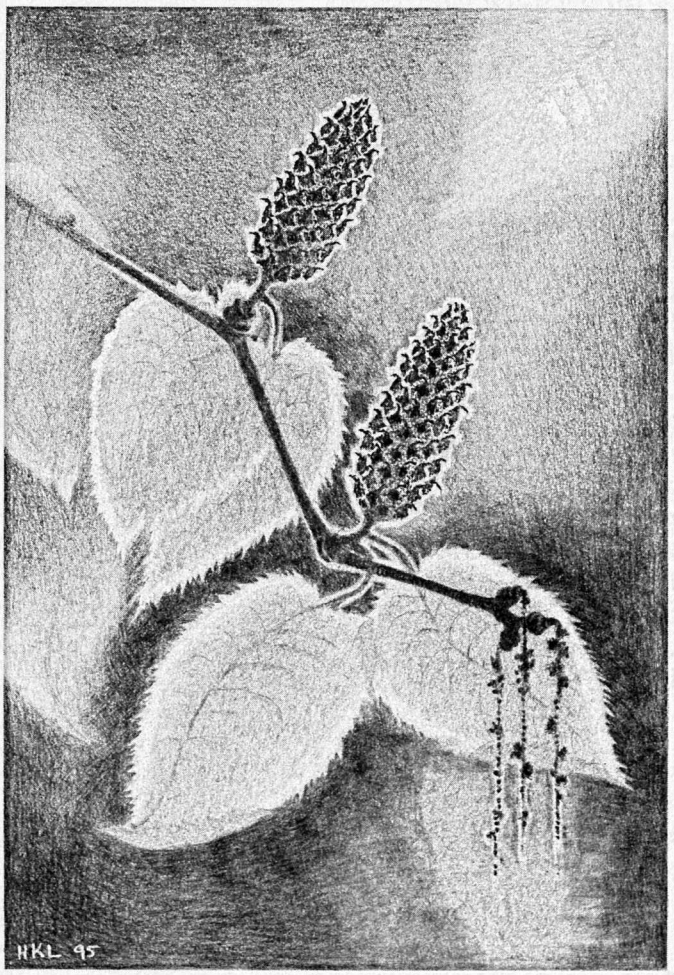


bark of mature Black Birch with sign of avian seed dispersal

shaped or rounded, often uneven at the base, doubly or singly serrate, acute or acuminate. Ovate is the most common shape. Early leaves are a downy pale green. Mature leaves are dark green above and pale yellow below. Mature leaves of the Black and Yellow Birch are similar in shape and color. Birch leaves turn bright yellow in the fall. In *A Sierra Club Naturalist's Guide*, author Neil Jorgensen lists at least one variant form of the Black Birch with deeply cut leaves. Jorgensen does not identify the location (or locations) where this type is found.

FLOWERS AND FRUITS

The tree blooms in April-May before the leaves unfold. Catkins containing male flowers are clustered in slender hanging "tails" 2-4 inches long and develop in late summer and fall; they mature the following spring. Female flowers are shorter and thicker than the male counterparts. Fruiting is from August to early October, depending on the latitude and altitude. Seed production begins around 40 years and is substantial every year or two. The light seeds are wind scattered.



pistillate catkins in summer

AGE

Black Birch has been described by some authors as moderately fast-growing, reaching full size in 80 to 120 years. Interestingly, it has also been described as slow growing—in terms of reaching a commercially valuable size. Silvicultural data often list a maximum longevity of 150 years for the species; yet on old growth sites, *Betula lenta* can exceed 200 years. Forest ecologist Tad Zebryk and I dated a small birch on the side of Mt. Everett in the Taconics of southwestern Massachusetts to 208 years. Had the core been extracted from the base of the tree, the age would have been between 212 and 220 years. Later we dated a Black Birch growing on Todd Mountain in the Berkshires of Massachusetts that is likely between 250 and 300 years old. A 12-centimeter core yielded 183 years. The remaining 17 centimeters to the center were rotten. Following this dating, I began to suspect that many Black Birches in the Berkshire uplands surpass 200 years. Partial ring counts on downed trees support the hypothesis, as do data from other regions. In Pennsylvania's virgin Hearts Content stand, a Black Birch was aged to 265 years. A Black Birch in Tionesta, another old-growth stand in Pennsylvania, was dated to 192 years. A tree on Mount Tom in the Connecticut River Valley recently dated by Dr. Peter Dunwiddie, Plant Ecologist for the Massachusetts Audubon Society, is 250 years old. As far as I know, the "Dunwiddie" tree is the oldest confirmed Black Birch in the Commonwealth. The tree is not unique, but one of several appearing to be in the same age range. Perhaps in second-growth stands the longevity of the Black Birch is lower, and this gave rise to the 150 year silvicultural figure.

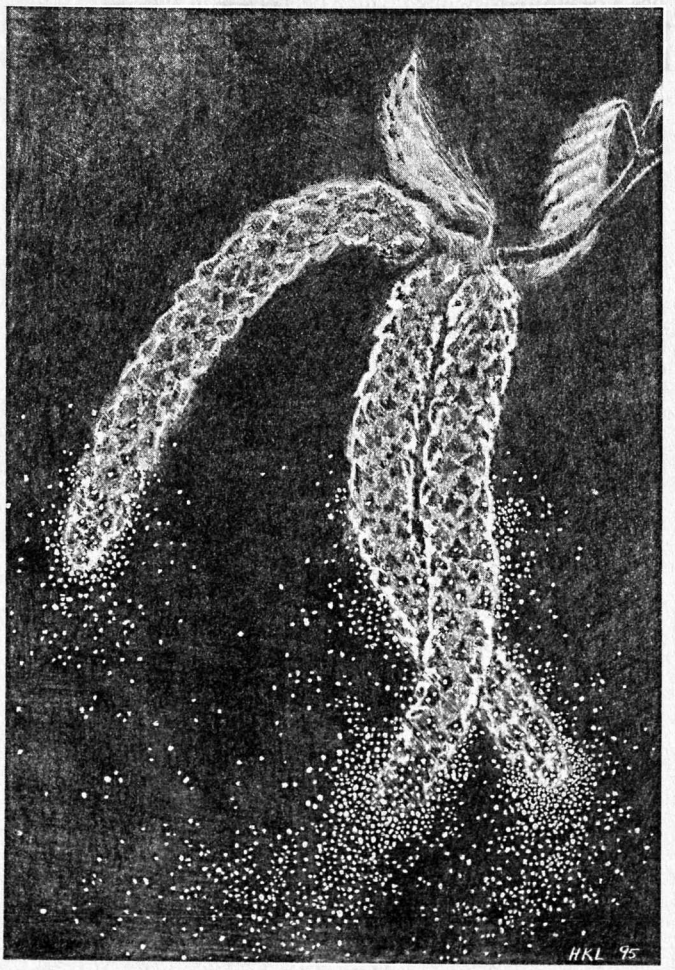
DISTRIBUTION AND ECOLOGICAL NICHE

The Black Birch has a rather odd, if not contested, range. Modern distribution maps such as that included in Thomas Elias's *The Complete Trees of North America—a Field Guide and Natural History*, published in 1987, show the northern boundary of its range as a small, isolated part of southern Canada, but primarily as southern Maine, central New Hampshire and Vermont and westward following the southern boundaries of Lake Ontario and Erie. The Black

illustrations by Heather K. Lenz

Birch's range is shown as southward along the Allegheny highlands on the west and the Blue Ridge on the east to the end of the Appalachian chain in South Carolina, Georgia, and Alabama. Its western-most extension is given as two isolated colonies in western Kentucky and in western Alabama. This distribution is at considerable odds with older descriptions. According to sources like Simon Elliot's *Important Timber Trees of the United States*, published in 1912, the western range of the Black Birch is (or was) Minnesota, Iowa, and a little piece of eastern Kansas. F. Schuyler Mathew's *Field Book of American Trees and Shrubs*, published in 1915, describes its western extension as central Iowa. Other sources give the western range as southern Indiana and Illinois and southward through the Allegheny mountains to central Tennessee and Kentucky. The *Field Book* and Lorin Dame and Henry Brooks's *Handbook of the Trees of New England*, published in 1901, place the southern limit as western Florida. Volume Three, Part One of the *The New Nature Library—The Tree Book* by Julia Ellen Rogers, published in 1914, gives the Black Birch's distribution as Newfoundland to western Ontario, south to Kentucky, Tennessee, and Florida, and west to Kansas. Another source lists Florida and northern Georgia as the southern extreme of the range—an odd geographical line to say the least. I cite these sources to emphasize the apparent shrinkage of the Black Birch's range. I believe the most plausible explanation for the difference between the range listed in current books as opposed to older ones is that the Black Birch has steadily lost habitat over the past 50-75 years.

Like the Red Maple, Black Birch appears as a constituent of several forest types but is an indicator species of none. On occasion, the Black Birch is described as a transitional species, but more often as a secondary species. Only rarely, in some highly disturbed areas, is it the dominate tree in a stand, and only over small areas; i.e., the birch tends to grow in clusters or small pockets, giving way to other species over larger areas. Black Birch is fire sensitive. Although it can repopulate a burned area if a seed source is nearby, mature Black Birch in a stand is a good indication of the absence of severe fire over the life span of the trees. In central New England, Black Birch mixes with other species, often appearing as a small tree growing in what was formerly tilled soil. An abundance of Black Birch is considered to almost always be a sign of soil disturbance. As with its range, descriptions of the Black Birch's habitat vary greatly. Black Birch generally prefers good, fairly damp, loamy or gravelly soil, but grows in a variety of habitats, including dry soils. In western Massachusetts, the Black Birch is frequently found on moist rocky slopes where sunlight and mineral soil are both fairly abundant. It is equally at home in rock ravines where it wraps its roots around rocks much as does the Yellow Birch. I have seen Black and Yellow Birch growing side by side from rock outcroppings. However, the role of the Black Birch is so puzzling that it isn't even listed in the popular *Eastern Forests* by John Kricher and Gordon Morrison, an amateur's primer in forest ecology. Neither is *Betula lenta* listed in Charles Johnson's equally excellent *The Nature of Vermont*, though it is relatively common in the western part of the state. In the famous Harvard Forest-Harvard University study (Spurr and Cline, Harvard Forest Archives Study, Cambridge, MA, 1942) that covers a virgin stand on Pisgah Mountain, New Hampshire, the Black Birch is listed as a climax species. Other habitat listings describe the Black Birch as preferring mountain slopes and stream banks.



staminate catkins in spring, wind dispersing pollen

The Black Birch is a source of food for wildlife. Its seeds and buds are eaten by grouse. Moose, deer, and rabbits browse the twigs. Black Birch leaf litter enriches the soil with phosphorus, potassium, and nitrogen.

HISTORICAL USES

Over the years, Black Birch wood has seen many uses. According to *Eric Sloane's America*, published in 1956, "Birch was rated second among the hardwoods. It was a mainstay with the white cooper and it made perfect material for both lye-ash and charcoal. Both tanning-oil and wine were made from birch sap by the Indians and later by the settlers. Birch is said to take a fine polish and is consequently used for furniture making. Furniture makers once used its wood as a substitute for mahogany, thus the name mahogany birch. When first cut the wood has a beautiful rosy tinge which deepens with age and exposure." Although its wood is valuable, the slow growth rates of *Betula lenta*, compared to species like Northern Red Oak, reduce its value considerably as a lumber tree. Its commercial heyday was in the past before the biggest members of the species were cut. During that period, in addition to the uses above, Black Birch was employed in boat and ship building and as a substitute for hickory for wagon axles. As a fuel, Black Birch is said to have been second only to hickory.

Betula lenta's aromatic twigs are an important source of the oil of wintergreen and make fine toothpicks in the backwoods. Pioneers are said to have devastated young birch to secure the precious oil. Birch beer utilizes the sap and corn which ferment together. When tapped in the spring, Black Birch yields substantial quantities of slightly saccharine sap, which flows around the time leaves begin to appear. Birch sap flows more freely than that of the Sugar Maple.

Native Americans recognize the value of the Black Birch both as a medicine and food source. They brewed a tea from its ground bark. In her book *Tree Medicine Tree Magic*, Ellen Evert Hopman states that the Black Birch was used "to heal urinary problems and to expel worms." She says Black Birch tea was used as an astringent mouthwash for mouth sores, and to ease diarrhea and rheumatism. Native Americans shred the inner bark and dried it in the spring to secure its abundant starch and sugar in a dish cooked with fish. According to Hopman, birch leaves, twigs, and inner bark are rich in vitamins A, B1, B2, C, and E. In the past, candy makers valued its oil to make wintergreen candy.

ROLE IN OLD-GROWTH FORESTS

In the old-growth stands of southern New England, the Black Birch exploits random natural disturbances and persists indefinitely on moist slopes where windthrow provides exposed mineral soil and ample light. In the Berkshires of western Massachusetts, the Black Birch is a prominent resident of steep ridges. Although Black Birch depends on disturbances to reseed itself, and tends to steadily decrease in old-growth stands where increasing periods of time elapse between significant natural disturbances, the tree is sufficiently long-lived to persist even in such stands. On the side of Mount Tom, a 1200-foot-high volcanic ridge lying in the Connecticut River Valley, Black Birch forms an association with hemlock, its genesis in a long history of human disturbances; but Black Birch is an equally significant component of the oldest stands of trees on the mountain, stands that have suffered the least human and natural disturbance. The birch's persistence on the slopes of Mount Tom is a product of the Black Birch's longevity and the shallow duff layer. Infrequent minor disturbances provide ample exposure of mineral soil for new birch growth.

That Black Birch in old-growth areas of New England, such as in the Pisgah tract of southern New Hampshire, usually reflects disturbance regimes is supported by past studies of the virgin hemlock-dominated stands in western Pennsylvania, which exhibited Black Birch only in areas of repeated disturbance. In the Northeast, then, Black Birch is a colonizer of naturally and artificially disturbed areas.

In the Great Smoky Mountains the Black Birch has been described as "a characteristic canopy tree in closed oak and hemlock forests, a non-dominant species in cove hardwoods, and occurring occasionally in spruce-fir forests" (Stupka 1964). We can assume the requirement of disturbance of one form or another in these forests, but perhaps of a more infrequent and random regime than is typical in the Northeast, where windthrow is common.

FUTURE OF THE BLACK BIRCH AND EASTERN FORESTS

Pollen records indicate that the birches and maples returned to New England about 9000 years ago, after the retreat of the glaciers. Both families are thus long-time residents of the Northeast. To my knowledge there is no specific catastrophe waiting just around the corner to do in the Black Birch like the chestnut blight has done to the American Chestnut; but like virtually every species in the East, the Black Birch faces multiple environmental assaults to its health. Atmospheric pollution, insect infestation, and various pathogens are attacking trees today more frequently than at any time in years past. The threats are the result of incessant human meddling with the natural order. Without significant reductions in pollution and in the introduction of exotic pathogens, we could soon be talking of birch decline as we currently speak of the demise of the American Chestnut and American Elm; the White Ash, Red Oak, Sugar Maple, Butternut, and Red Spruce decline; the threat to the Eastern Hemlock from the Hemlock Wooly Adelgid; and the possibly terminal beech bark disease. Are we seeing an acceleration in the decline of the Eastern forests? Are worse forest catastrophes yet to come? With respect to forest health, I find little to cheer about these days.

Robert Leverett (52 Fairfield Ave., Holyoke, MA 01040) is the East's greatest old-growth evangelist. He offers guided old-growth treks, for both the converted and the still uncertain, in old-growth remnants throughout the Northern Appalachians and Adirondacks.

Life in the Margins

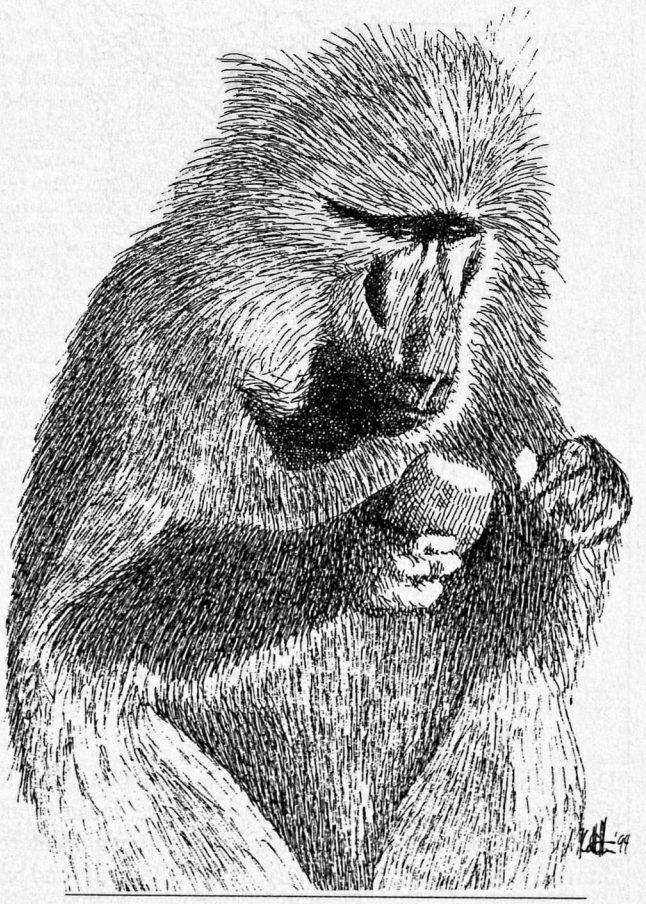
Emphasis on local species diversity has overshadowed an important aspect of reserve design

INTRODUCTION

Traditionally, biological reserve design has emphasized local species diversity (Franklin et al. 1972). Reserve design theory has increasingly used island biogeographic theory—especially the principle that species diversity increases with habitat patch size (Shafer 1990). But studies of species' distributional abundance suggest another biogeographic lesson for conservationists: Populations at the centers of species' ranges are more dense and stable than periphery-of-range populations (Brown 1984 and 1995; Brussard 1984; Telleria and Santos 1993). Theoretically, this is because the center of a species's range represents the habitat in which the multiple niche requirements for that species—climate; soil type; presence or absence of predators, prey, or competing species; etc.— are best met. Many niche components are autocorrelated across the landscape; soil, for instance, is more likely to be similar to that of the center only a few miles away than is the soil found a hundred miles away (Brown 1984). Such niche components tend to change gradually across terrestrial landscapes, along gradients. As one travels from the center of a range, suitable habitat becomes more patchily distributed and existing patches become less optimal, as fewer niche requirements are met. Gradually, one approaches the edge of the range, beyond which too few of a species's needs are met to maintain populations.

Periphery populations are therefore rarer, contain fewer individuals, and are less stable. Recent studies of the developmental stability of individuals (how well genes are translated into healthy adults) attest to the difficulty of a life in the margins (Palmer and Strobeck 1986; Shaikin 1992; Møller 1995).

The suboptimal habitats and sparser populations at the periphery of species' ranges, though yet to be documented for many taxa, appear to offer a simple formula for conservationists: "Protect range centers!" The densely populated range centers would be expected to better resist anthropogenic stresses that may lead to extinction in the range peripheries, where periodic extinction events occur naturally (Brown 1984). Javanese and Indian Rhinoceros populations have collapsed toward the stable centers of their historic ranges, for instance (Lomolino and Channell 1995). Patterns of human impact and evolutionary dynamics at species boundaries, however, suggest that a more comprehensive solution will often be called for, and lend support to the notion that large biological reserves will better prevent extinctions than small ones.



by F. Bryant Furlow

Baboon *by Keith Peters*

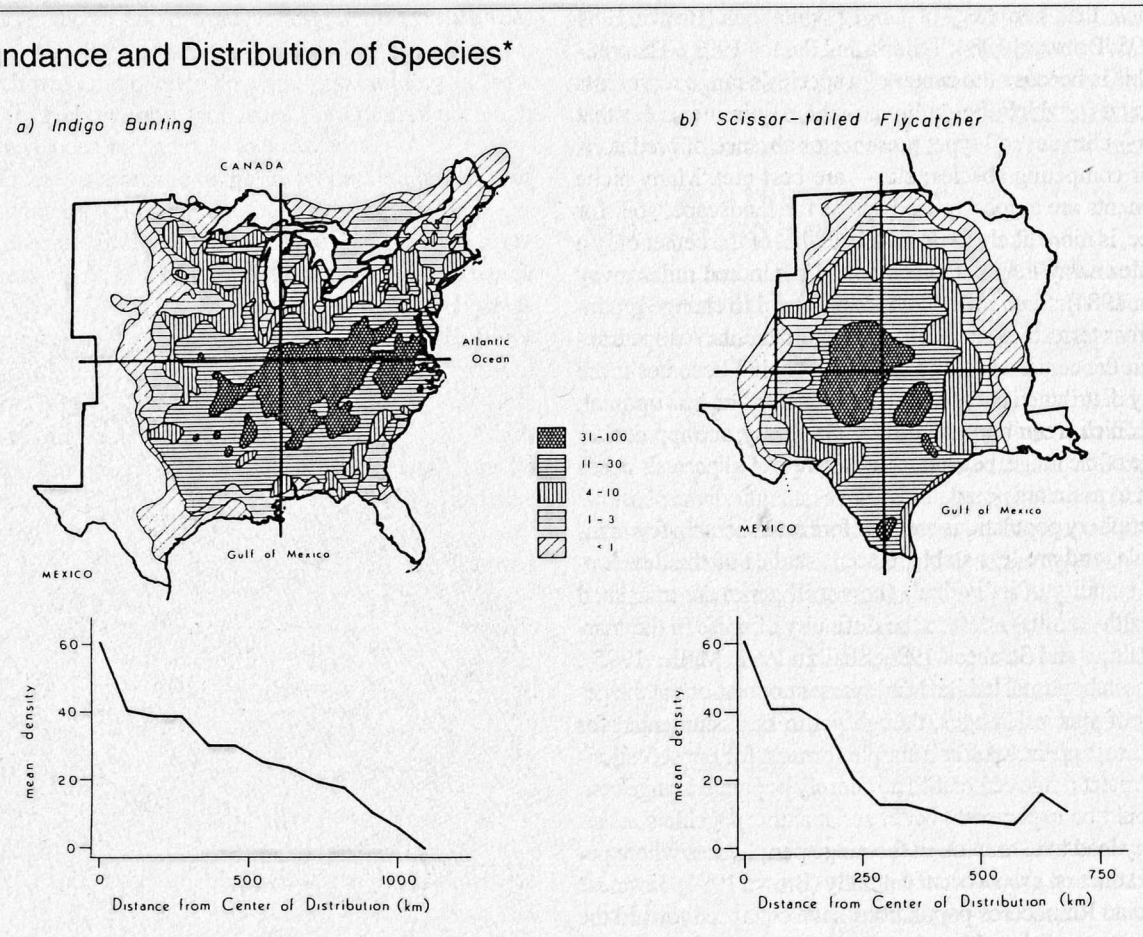
PRODUCTIVE CENTERS

There are circumstances in which range centers' dense populations are more at risk than patchily distributed marginal populations. Diseases travel much more quickly through areas of high population density, and range centers are often the most productive areas of a region—the very places humans prefer to build their cities, plant their crops, and exploit bountiful natural resources.

Mark Lomolino and Rob Channell (1995) studied the recent declines of 31 mammal species, and found that as their populations were extirpated from their original ranges, only 8 of the species (including the rhinoceros species mentioned above) collapsed toward range centers, as biogeographers would have predicted. The rest—including Giant Pandas, European Mink, Red Wolves, and Australian Bilbies—collapsed outward toward peripheral refugia, with populations in range centers going extinct first. Where the edge of continents constitute range peripheries, island populations often represent the last populations of once widely ranging species. The reason for the unexpected trend is unclear; but Lomolino and Channell identified a significant trend in North America and Australia for such collapses to occur from east to west, suggesting that European settlement of productive habitats has played an important role. This pattern supports Lomolino and Channell's argument that human impacts such as biocides, habitat fragmentation, and introduced species stress native species in a manner mimicking epidemic disease.

VULNERABLE MARGINS

Lomolino and Channell conclude that isolated periphery populations should be targeted for conservation, or even established on isolated islands they never originally occupied, in order to insulate the animals from human impacts. It is not clear, however, that peripheral refugia are more stable in all cases. The declines documented by Lomolino and Channell may still



Distribution of abundance of two bird species, Indigo Bunting (*Passerina cyanea*) and Scissortailed Flycatcher (*Muscivora forficata*) over their geographic ranges. Above, mean population density per standardized census. Below, mean population density along four arbitrary transects running from the center of the range to the periphery as shown above. Compiled from maps drawn by D. Bystrack (see also Bystrack 1979, 1981) and based on the US Fish and Wildlife Service's Breeding Bird Survey.

*After J.H. Brown (1984). This figure originally appeared in *American Naturalist* and is reprinted with permission. ©1984 The University of Chicago Press.

be in progress in some cases, with remnant populations at range edges simply having yet to go extinct.

Peripheral populations are often "sinks," which would go extinct were it not for immigration from more productive "source" populations. For this reason, it makes little sense to conserve only peripheral refugia. That natural extinction events are more common at range edges (Brown 1984) suggests that reserves established on the edge of a species's range will offer only tenuous insurance against extinction. Many of the places that appear to be attractive candidates for reserves, containing numerous species in a small area, will be habitats where a large number of species' ranges overlap at the edges.

Margins, then, should be neither neglected nor made the sole focus of conservation efforts. In cases of range collapse to the periphery, they're a species's last hope. Because of the different selection pressures at the margins, populations there may "spin off" subspecies, which tend to be more vulnerable to human impacts than their more widely ranging parent taxa. Thus, peripheral populations can play an important role in the evolutionary dynamics of a species, and will require habitat conservation measures.

CONCLUSIONS

What appears at first glance to be a simple rule of thumb for reserve design is complicated by patterns of population decline across terrestrial landscapes. These patterns do not always support the idea that saving the centers will suffice. When circumstance forces conservationists to choose a representative segment of a species's range to protect, assuming impacts are suffered equally throughout that range, we can fall back upon the rule of thumb of protecting centers, albeit with considerable risk. Better would be the conservation or restoration of both range centers and peripheral habitats, sufficiently large, proximate, and connected by corridors to allow gene flow between populations at rates similar to historic patterns. Additional, naturally isolated refugia should be maintained in the periphery as insurance against extinction by contagion.

In cases where peripheral populations are vulnerable but wide-ranging central populations are not, conservation emphasis obviously should be placed on life at the margins. Simply expanded, the rule of thumb might be: "Protect large central reserves with both connected and isolated periphery reserves" for conservation-targeted species. When target species are considered collectively, this quickly becomes a call for regionally organized, linked macro-reserves, since one species's range center may be the edge of another species's range.

Biogeographers and ecologists must continue to refine and broaden our understanding of the relationship between location within a range and population density and stability. Conservationists, meanwhile, must not risk all on what may be a siren's call of local biodiversity and depend upon small reserves at range overlaps. The time is quickly approaching when, as Frankel and Soulé (1981) warned, we will have decisions of where and how much habitat to conserve made for us by circumstances utterly beyond our control. We must make careful, deliberate use of biogeographic lessons for the design of biological reserves now. In the long run, *where* to place reserves may prove just as fundamental a question as how much to reserve.

Patterns of human impact and evolutionary dynamics at species boundaries... lend support to the notion that large biological reserves will better prevent extinctions than small ones.

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Global Warming and The Wildlands Project

Some Considerations

by Thomas P. Rooney

INTRODUCTION

One of the greatest challenges for The Wildlands Project will be coping with global warming. Many atmospheric scientists believe that the doubling of carbon dioxide in our atmosphere will cause the Earth's temperature to rise 1.5° to 4.5° Celsius by the end of the next century. However, this warming will not be uniform; some regions may cool by 3°C, while other regions may warm as much as 10°C (Schneider et al. 1992). While the Earth's climate has been this warm in the past, the rate of change is unprecedented. Global warming is predicted to occur 10-40 times faster than the average rate of warming following the last ice age (Roberts 1988). Biologists generally agree that global warming will greatly reduce biological diversity through reductions in genetic diversity (Watt 1992) and species extinctions (Peters and Darling 1985).

How will ecosystems respond to global warming? During past periods of warming, ecological communities dissolved into their component species, and each species migrated to areas where temperatures were more favorable (Peters and Darling 1985). Species do not all migrate at the same rate. For example, a Black Bear can migrate several kilometers per year, but an American Beech might travel only 20 kilometers per century. Essentially new ecological communities will emerge (Hunter et al. 1988).

Noss (1992) offers several strategies for minimizing threats to species during global warming. These include protection of: (1) all physical habitats, such as soil types and slope aspects; (2) intact environmental gradients; and (3) unfragmented elevational gradients. Each of these factors is critically important, and each should be given full consideration when developing Wildlands proposals.

ADDITIONAL STRATEGIES

In addition to the recommendations made by Noss (1992), I believe the following should be given special consideration by all Wildlands proponents:

1. Range-limit populations. While populations located near the edges of species' ranges may be at high risk of extinction during climate changes (Peters and Darling 1985), they may be better adapted for unfavorable or changing conditions (Hoffmann and Blows 1994). So although not all such marginal populations will survive global warming, a few may become "source populations" in the future, acting as the founders in new geographic ranges after climate change. In the northern hemisphere, populations at the northern limits—nearest the pole—of a species' range may be likely to become these source populations (Rooney 1994). However, during past climate warming, some species have responded by moving toward the equator, possibly in an effort to avoid competition from migrating species (Huntley and Webb 1989). Therefore, all populations located at the edges of their species' geographic ranges should receive increased attention by Wildlands proponents. [See "Life at the Margins" this issue.]

2. Propagule dispersers. The protection of animal species that disperse plant seeds, mycorrhizal fungi, or other animals will be critical to maximize the dispersal potential of sedentary species (Mills et al. 1993). Many of these species, such as Blue Jays and Gray Squirrels, are persecuted by activists because of their potential to depredate songbird nests; yet they provide beneficial services as well. Other important seed dispersers include ants, fruit-eating birds, and most mammals (Stiles 1989). Though not all these species will need active protection, their importance should be recognized.

CONCLUSION

If global warming occurs as predicted, biological diversity will be lost at the genetic, species, and community levels. Many species with restricted distributions will be lost. To buffer against extinctions, Wildlands proposals should incorporate all of the recommendations provided by Noss (1992). All reserve proposals should include adequate representation of all soil types, slope aspects, and elevational gradients for the region. In addition, species should be given special attention at the edges of their geographic ranges. Likewise, the importance of keystone mutualists should be recognized. While The Wildlands Project land conservation strategy will not prevent the extinction of all species during global warming, properly designed reserves will improve the chances of species survival.

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illustration by Robin Peterson

Sustainable Silviculture In Eastern Hardwood Forests

by Paul J. Kalisz

INTRODUCTION

After 100 years of "scientific" forestry, many foresters have concluded that conventional approaches to management have not protected the native biodiversity of North America or contributed to the common good. A dialogue has begun concerning new forest management paradigms that are compatible with the preservation and restoration of biodiversity, and the commencement of sustainable human lifestyles. As part of this transition, increasing numbers of silviculturists are questioning fundamental concepts, goals, and techniques and are modifying these to support sustainable forms of silviculture. The generalized procedures and guiding-principles presented below are a contribution to this movement. These ideas integrate my own experience in forestry with discussions of sustainability and silviculture found in many publications including those by Behan (1990), Daly (1991), Ophuls and Boyan (1992), Peet (1992), Franklin (1993), Hardin (1993), Society of American Foresters (1993), Maser (1994), and Noss and Cooperrider (1994).

Sustainable Silviculture may be defined as the art and science of managing or tending forests over the long term in such a way as to maintain or restore high levels of ecosystem health, while providing the forest commodities and amenities required by humans. The emphasis of sustainable silviculture is on simple and ecologically sound methods that will work over the long term, independent of the economic and political milieu and of the availability of fossil fuels. Details of appropriate methods and techniques will necessarily be case-specific, and based on the accumulated knowledge and experience of applied sciences such as ecology, horticulture, silviculture, and statistics. All former silvicultural systems, which were originally developed exclusively to guarantee a sustained yield of forest commodities, must be modified to fit the ecosystem approach and biocentric goals of sustainable silviculture.

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.

Aldo Leopold, 1948
A Sand County Almanac

The principles of sustainable silviculture presented here are applicable to forests that compose buffer zones, habitat corridors, and multiple-use matrices surrounding wilderness core areas in reserve systems such as those proposed by The Wildlands Project. These principles may also serve as the basis for initiating sustainable silvicultural practices on individual forest tracts managed by organizations or individuals. Widespread implementation of the principles discussed in this paper will not occur, however, until we acknowledge that the health and survival of human societies and economies depend on the health and survival of the natural ecosystems of which they are a part; that the finitude of the Earth sets absolute limits on sustainable rates of consumption, pollution, and growth; that all species have a right to exist and to equitably share the Earth's resources; and that the present generation of humans must respect the needs and rights of future generations.

PROCEDURES AND GUIDING PRINCIPLES

The following steps are essential to the implementation of a system of sustainable silviculture. The guiding principles of sustainable silviculture are presented as numbered annotations to each of the eight steps.

I. Management goals should be clearly stated, unambiguous, and described as quantitatively as possible.

(1) The concept of sustainability applies to all ecosystem properties and processes rather than only to productivity ("sustained yield") of commodities. For example, this concept recognizes the need to preserve genetic diversity (even in stands dominated by a single tree species) and the integrity of biogeochemical nutrient cycles.

(2) Wood and other forest products are essential to healthy and dignified human lifestyles. However, harvesting and utilization of forest products must be limited by two ethical precepts: (a) the health and survival of all life-forms and of the entire ecosystem must not be threatened by harvesting; (b) excessive and frivolous human consumption are incompatible with the concept of sustainability.

(3) A strong land ethic is essential to sustaining human life on Earth. Decisions must be based on what is good for the ecosystem and the organisms dependent on the ecosystem rather than on economic profitability.

II. Even when written for a relatively small forest holding, the management plan should have broad spatial (landscape-level, at least 100,000 acres) and long temporal (typically about 500 years) perspectives. The plan should represent a scientifically and ethically sound blend of (a) optimum goals and management procedures in terms of the land-holder's individual best interests; and (b) optimum goals and procedures in terms of the entire natural community's collective best interests. The ecosystem should never be degraded in order to satisfy short-term economic objectives. Objectives and procedures should be flexible, but also as unambiguous and quantitative as possible.

illustration by Nancy Roy

III. The ecosystem should be described in as much detail as possible. This ecosystem inventory should include descriptions of biotic and abiotic properties and processes and past land-use history, thus providing the foundations for management. Not all ecosystem components require equal emphasis. The amount of effort devoted to describing any one element should be based upon management goals and procedures; upon identification of ecosystem components and characteristics that are especially important, scarce, or fragile; and upon pragmatic considerations related to the availability of time and resources. Effort will be required to describe the larger landscape matrix that encompasses the holding of interest in order to allow for landscape-level planning.

(1) Management should be for entire ecosystems, rather than individual ecosystem components such as trees. Since ecosystems are complex, composed of inter-related components, and variable over time, human understanding and knowledge will always be imperfect. Ecosystem management therefore typically involves manipulation of the vegetation component. This is a reasonable approach since: (a) the primary production of green vegetation supports all other forms of life; (b) the composition and condition of the vegetation integrates the effects of environment and land-use, and indicates the state of ecosystem health; and (c) techniques for managing vegetation are well-developed relative to techniques for managing other ecosystem components.

(2) Estimates are made of the annual production of the various forest products needed by humans. These estimates define production at a single point in time, and contribute to the description of the ecosystem. Productivity estimates define the upper limits of human utilization (the traditional "annual allowable cut" in the case of wood) but are not intended to encourage over-use, nor to imply that the annual production is unchanging over time or that the annual production should be harvested.

IV. A statement of desired future conditions should be developed. This should be as unambiguous and quantitative as possible, and should chart desired changes in conditions over selected time intervals to provide the basis for monitoring the success of the management plan.

V. A set of management alternatives should be formulated. These should be creative, scientifically based, and individualized for the holding of interest. Alternatives should consider all the information gathered in steps I–III, and should represent sound land ethics. Specific management techniques and procedures should be identified for application to various portions of the holding, and a schedule of activities should be developed. The land area may need to be subdivided into management sub-units. Novel techniques or procedures that require attention to detail should be documented and explained in full. A monitoring system for following the progress of the management plan and keeping track of "ecosystem health" should be developed. Knowledgeable and experienced individuals, interested members of local communities, and written sources of specialized information should be consulted and used in developing the alternatives. All of the alternatives should be ecologically sound and should represent landscape-level planning such that management of the holding of interest is, to the extent possible, integrated with land-use activities in the encompassing landscape matrix.

VI. The alternatives should be evaluated, discussed, and modified as necessary. The strengths and weaknesses of the various alternatives should be studied, and hypothetical changes in ecosystems should be considered in terms of how they would affect and be affected by the management alternatives. As always, evaluation of alternatives should consider integration of land use on the holding of interest with land use within the encompassing landscape.

VII. The best alternative should be selected for implementation on each management sub-unit. The detailed methods and techniques that will compose the sustainable silvicultural system are selected, with decisions based on the management goals and on the nature of the ecosystem under consideration.

(1) Simple, "light-handed" methods, not based on fossil fuels, are used for growing and harvesting forest products, and for manipulating ecosystems. Animal-power is used in preference to machine-power, and natural products are used in place of artificial chemicals.

(2) It is unwise and not in the long-term interests of ecosystems and life in general to initiate management programs that rely on pesticides or other petroleum-based and potentially harmful chemicals. Even in agriculture, long addicted to such chemicals, the trend is to reduce or eliminate chemical-dependency. Foresters should not abandon their traditional reliance on "organic methods" of managing forests.

(3) Sustainable forestry recognizes the natural tendency for ecosystems to change and accepts limits to human control. The favoring of "preferred" or "commercial" species and discriminating against "weed"

species is replaced by working with the best-adapted native species, as indicated by competitive success on a particular site. Adapting management to natural trends that are in any case beyond human control immediately "solves" many forest management "problems." For example, the "oak-regeneration problem," or failure of harvested oak stands to naturally regenerate on moist and fertile sites in eastern deciduous forests, ceases to be a problem once natural trends and human limits are accepted.

(4) Ecosystems with high levels of biodiversity appear to be more stable and more amenable to long-term human use than ecosystems with low diversity. Sustainable forestry therefore maximizes, within the natural limits of a particular site and ecosystem, the vertical and horizontal diversity of forest structure, age, and native species composition and genotypes. Tree improvement programs and genetic manipulations that alter or reduce genetic variability, or lead to monocultures or genetically uniform plantings, are avoided.

(5) Trees are managed in uneven-aged stands and harvested by single-tree selection or by selection of groups less than about one average tree height in diameter. Where appropriate, conventional thinnings are performed to obtain cordwood or to release selected trees or patches of seedlings.

(6) Natural regeneration of native species is allowed. This may be supplemented as necessary by planting seedlings or sowing seed obtained locally.

(7) Trees are considered for harvest only if they satisfy both of the following criteria: (a) they are larger than a pre-determined and large DBH-limit, which differs by site and species but is generally ≥36 inches for eastern hardwoods on good sites; and (b) they are judged not to be vigorous enough to survive until the next cutting cycle (5-15 years). Trees that die before reaching this DBH-limit, and some trees that die after exceeding this DBH-limit, are left to provide snags and fallen logs. It is assumed that unplanned catastrophes will occur frequently enough to provide the conditions required by the few species that naturally occur only in large even-aged blocks of forest. The use of selection silviculture, long rotations, and the harvest criteria described above will ensure the continued and common occurrence of large, old living trees and of large snags and logs.

(8) Trees to be cut by single-tree or group selection should be marked, and all operations should be supervised on-site by a competent forester committed to the method. Logging should be done by certified loggers using directional felling and low-impact logging and skidding techniques. Such careful management techniques will overcome many of the problems commonly ascribed to selection silviculture. For example, the use of draft animals to skid logs will minimize the need for permanent roads and the amount of damage done to residual trees during forestry operations.

(9) Reductions in annual per-acre yields of forest commodities that result from the change to less intensive, sustainable silvicultural methods are countered by reductions in consumption. For example, in the eastern United States the development and use of long-lasting non-wood pallets could reduce the demand for hardwood volume by 30-50%, and the use of non-tree fiber crops such as kenaf and hemp could reduce the demand by at least 10%.

VIII. Alterations in ecosystems caused by human activities and natural processes should be monitored, and the ecosystem inventory should be updated to reflect changes. Records are kept of all silvicultural activities, including the removal of forest products. The efficacy of the silvicultural procedures is continually evaluated, and details of the methods employed are modified over time to suit the ever-changing characteristics of the ecosystem and needs of society.

Concluding Comments

Silviculturists should be open-minded and committed to a biocentric land ethic, and to flexible and innovative management plans that conform to the flow of Nature. They should be willing to abandon concepts and practices that become obsolete due to improved understanding of ecosystems. Above all, they should believe in the future. WERF

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Old-growth Forests in the Catskills and Adirondacks

by Michael Kudish

THE CATSKILL AND ADIRONDACK PARKS of New York State contain some of the largest tracts of old-growth forest in the eastern United States. I find six similarities between the old-growth forests of these two parks, but I also find four differences.

The first similarity is in the sheer abundance of old growth in both these parks. The Adirondack Park contains 5,927,600 acres of which at least 200,000 (3.4%) are old growth. The total number of acres of old growth has not yet been mapped and summed; the 200,000 acre value is an estimate from those who know the Adirondack forests best: Drs. Edwin H. Ketchledge and Barbara McMartin. In the 705,500-acre Catskill Park, I have mapped to date some 54,000 acres (7.6%) of old growth and find a little more every year. The Adirondacks may contain as much as 300,000 acres and the Catskills 64,000.

The second similarity is that the old-growth stands do not constitute a single tract but rather consist of numerous fragments. In the Catskills, I count 38 separate tracts, ranging in size from about a tenth of an acre to the roughly 16,000-acre stand in the Big Indian-Beberkill Range Wilderness Area. The Adirondacks probably have well over a hundred separate tracts, ranging in size from about a tenth acre to the ca. 50,000-acre stand in the Five Ponds Wilderness Area.

The third similarity is that the old-growth forests are either of the northern hardwoods forest type, the spruce-fir forest type, or of a transitional type between them. The northern hardwoods in both parts largely consist of Sugar Maple and American Beech.

The fourth similarity is that both regions have a rugged topography, with poor soils (often shallow to bedrock, acidic because of natural factors in addition to any created by people, and stony), and a short growing season. Large parts of the two parks were thus never cleared for agriculture and respectable portions never logged.

The fifth similarity is that both parks consist of a patchwork of private and public lands. Most of the old growth is in public ownership and thus protected by the New York State Forest Preserve. Several tracts are privately owned, so we must be on alert that owners are both aware and protective of their priceless treasures.

The sixth similarity is time. Such lands as these in Catskill and Adirondack Parks were least attractive to farmers and loggers and were thus settled very late, during the 1820s to 1860s: one or two centuries after the surrounding New York lowlands and much of the New England states were cleared for farms. The New York State Forest Preserve was established in 1885. There simply was not enough time for these old-growth tracts to be cleared for farms or logged from the years of settlement to the year of preserve establishment.

The first difference is wetlands. A sizeable portion (perhaps roughly 1/7?) of the Adirondack old-growth forest is found in bogs and swamps of Black Spruce, Eastern Larch, Northern White-cedar, and Balsam Fir. Very little of the Catskills is wetland and these conifers, except Balsam Fir, are absent.

The second difference is species composition at the higher elevations. Almost all the Adirondack first-growth forest above the 2500- 3000-foot level is spruce-fir. In the Catskills, only some of the old-growth forest above the 2500- 3000-foot level is spruce-fir; other peaks have Balsam Fir and northern hardwoods (beech, Red Maple, Yellow Birch, Black Cherry and some Sugar Maple).

The third difference is elevation of the old-growth forests. In the Adirondacks, perhaps half of the forest is above 2500 or 3000 feet on the upper slopes and ridges. The other half of the old-growth forest is at middle elevations of 1500 to 2000 feet, on the hilly to rolling plateau-like upland. In the Catskills, old growth is confined almost exclusively to the upper slopes and ridges above a mean elevation of 2900 feet. In only three locations to my knowledge is old growth found at lower elevations, from 1000 to 2500 feet: in the exceedingly precipitous and inaccessible Kaaterskill and Plattekill Coves, and in headwaters of the East Branch Neversink River.

The fourth difference is that in the Catskills, perhaps 80 to 90% of the old growth occurs along exposed, wind-swept, high-elevation ridges with shallow soils. Stunted, contorted, gnarled, and deformed trees are often only 20-30 feet high yet as old as 200 to 300 years. The old-growth Adirondack forest at the high elevations is also stunted, but at the middle elevations where soils are deeper and conditions less exposed, the trees can attain heights from 80 to 160 feet.

Again, although most Catskill and Adirondack old growth is in Forest Preserve and thus already protected from development, we should still be on the alert. Several types of threats could diminish New York's remaining old growth:

- At least two first-growth tracts are very close to state campgrounds, and could easily be disturbed by campers unknowingly wandering beyond campground boundaries.
- It is possible, though unlikely, that a current Department of Environmental Conservation boundary between Wilderness and Wild Forest could be moved in the future, placing a small first-growth tract adjacent to an intensive-use classification area and thus vulnerable to refuse accumulation, vista-cutting, concentrated camping, and firewood removal.
- Diseases caused by human introductions of trees from other parts of the world together with their pathogens and parasites threaten old-growth as well as second-growth forests. Likewise, clouds depositing acid precipitation do not recognize boundaries between first- and second-growth forests.
- Several first-growth tracts in the Catskills are privately owned. Many landowners, if aware of their irreplaceable holdings, would probably seek to preserve them. Unaware, these owners might eventually log their original forest. One example here should suffice: I last visited a remnant first-growth tract on the 3600-foot summit of Bearpen Mountain in 1984; I've been informed that it was cleared off in 1985. I've not had the courage to revisit it.

Michael Kudish received his Ph.D. from the New York State College of Environmental Science and Forestry at Syracuse and is currently professor in the Division of Forestry at Paul Smith's College. He serves on the Adirondack Mountain Club's Natural History Committee and has written a number of articles and books on the forest history of both the Catskill and Adirondack regions.

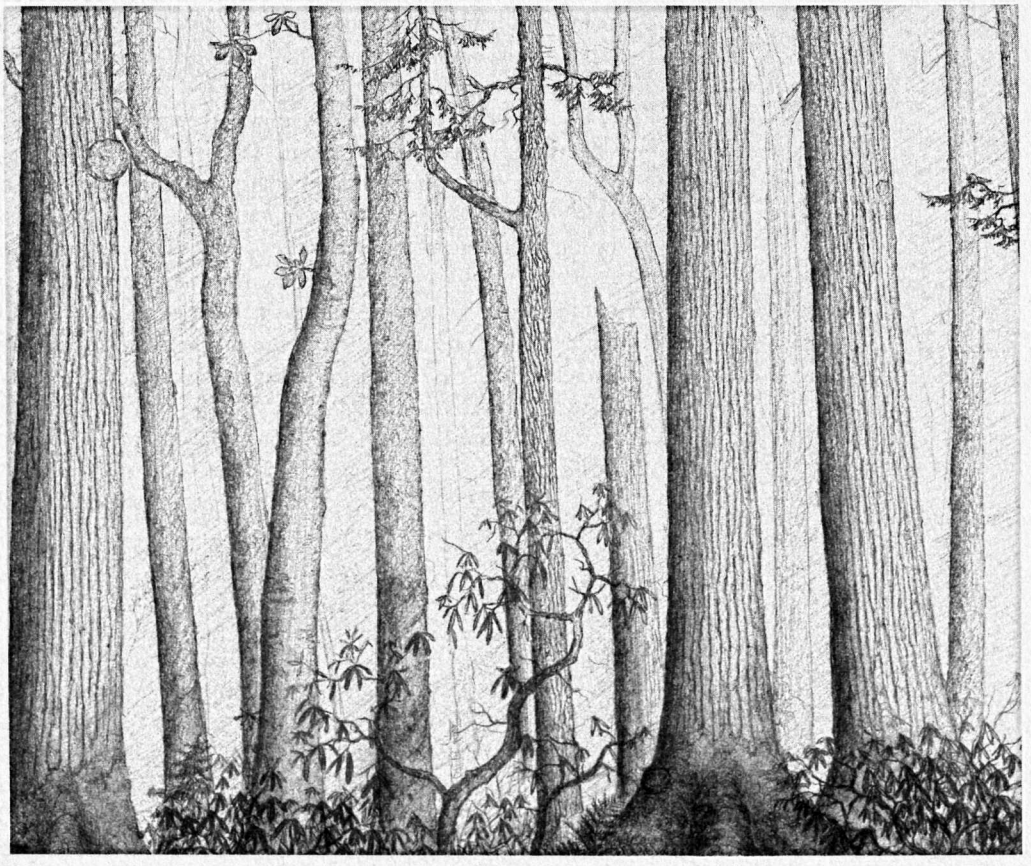

illustration by Rob Leverett Jr.

Threatened Eastern Old Growth

by Mary Byrd Davis

Announcements of old-growth finds in the East are no longer rare, but the total acreage of known Eastern old growth may not rise as fast as such reports would suggest. Numerous sites on both public and private land are threatened, as the following examples indicate. In many places, conservationists are making strenuous efforts to counter the threats; everywhere, more such efforts are needed.

NORTHEAST

In New York, a newly appointed state parks commissioner wants to log the 65,000-acre Allegany State Park, including the Big Basin Tract, which supports between 400 and 700 acres of old-growth hemlock/northern hardwoods. [See Ellen Gibson's article this issue.] Friends of the Allegany, a coalition of 36 organizations, which defeated earlier logging plans, is leading the opposition. The coalition has already helped persuade National Fuel Gas, owner of rights to gas that lies under the old growth, to reduce from 100 to 12 acres its cutting in Big Basin during gas extraction (1).

As to Adirondack State Park with at least 200,000 acres of old growth, Bruce Kershner points out that bills that would open up state land in the park to logging have in past years passed one or other house of the state legislature, and that, with Mario Cuomo out of office, environmentalists can no longer rely on a veto of such legislation by the governor (1). Michael Kudish mentions a few other possible threats to Adirondack and Catskill old growth in his article this issue.

In Delaware, most old growth is privately owned and is thus threatened by cutting, Bill McAvoy of the Delaware Natural Heritage Inventory reports. Two areas expected to be logged within the next couple of years, he says, are the 80-acre Mudstone Branch and a 25-acre woodlot, both within the Dover city limits. The owner of Mudstone Branch, with whom The Nature Conservancy has unsuccessfully tried to negotiate, intends to build housing on his site. The Delaware Department of Transportation plans to construct a road through the 25-acre tract, despite a recommendation to the contrary from the Delaware Natural Heritage Inventory.

As of June 1995, the Coalition to Save Belt Woods in Maryland is cautiously optimistic that its struggle to save 515 acres containing old growth will reach a successful conclusion by the end of 1995. Meanwhile, pressure on the Episcopal Church which owns the property must continue (2).

NORTH-CENTRAL

In northern Michigan, Meade Paper Company wants to cut part of its 10,000 acres in the roadless 20,000-acre Mulligan Creek Area which encompasses 2000-3000 acres of virgin forest. A proposal from Northwoods Wilderness Recovery (NWR) that Ottawa and Hiawatha National Forests buy and preserve Mulligan Creek led to discussions but no action. [See Doug Cornett's article "Using General Land Office Survey Notes in Ecosystem Mapping" *Wild Earth*, fall 1994.] NWR may file for an injunction. State logging plans threaten the Sand River Tract of Escanaba River State Forest, the site of scattered 10-30 acre patches of virgin hemlock/hardwoods, not cut previously because the area is

swampy. The US Forest Service (FS) has logged for several years in the semi-primitive Trap Hills area, adjacent to Porcupine Mountain Wilderness. At least one planned timber sale in Trap Hills includes virgin hardwoods. NWR has petitioned to stop the Trap Hills sales (3).

In Minnesota's Superior National Forest, the Forest Service plans to log old-growth White Pine even though the state's acreage of White Pine is now only about 0.5% of that in the presettlement era and is regenerating very poorly due to blister rust. FS's Powderflash Timber Sale includes 35 acres of old White Pine; and in the Gunflint Ranger District, FS has targeted old-growth White Pine sites for various timber sales. Superior Wilderness Action Network (SWAN) will take steps through the judicial system to save the pine (4).

Swamp conifers are a potentially threatened community, according to Mike Biltonen. Until now they have been saved by their small size and wet, northern locations; but, mostly on state and private land, they may become a source of pulp to the pulp and paper industry. The Minnesota Ecosystems Recovery Project intends to focus on this community (5).

SOUTHEAST

Sizable old-growth sites in Virginia, newly discovered by the Forest Service and the Virginia Division of Natural Heritage, have an uncertain future. In George Washington National Forest's James River District are 3600 acres of old growth broken only by one road—15% mesic oak and 50% dry to mesic or dry oak— and another 1100 contiguous acres of oak old growth. In Jefferson National Forest, discoveries include two stands in the Cliff Mountain area—the 275-acre Lonesome Ridge and the 230-acre Elija Lick Gap—and about 900 acres on Flannery and Pick Breeches Ridges, all three sites in the Clinch District. Virginia Natural Heritage recommends preservation for all these newly found old-growth sites. However, the recently revised George Washington Management Plan does not forbid logging of dry to mesic oak forest (6); and on the Jefferson, pending revision of the Management Plan, the safety of old growth largely depends on decisions by district rangers. The Clinch old growth includes mesophytic hardwood types (7) and is accessible, and the Clinch District is under heavy pressure to produce timber. Virginians for Wilderness is monitoring developments (8).

In North Carolina, private and state land dedicated through North Carolina's 1985 Nature Preserve Act must be kept natural in perpetuity; but, according to Merrill Lynch of The Nature Conservancy, "just about all the other old-growth sites are endangered." He cites as an example an old-growth bottomland hardwood forest owned by an elderly man whose heirs may have to sell the timber to pay estate taxes. The Nature Conservancy is trying to persuade the heirs to sell or donate a conservation easement. In the Pisgah and Nantahala National Forests, the Western North Carolina Alliance is identifying sites

Forest at Robert Allerton Park *by William Crook Jr.*

of older forest and urging the Forest Service to evaluate them for designation as old growth. Alliance member Rob Messick, researching the Grandfather District of Pisgah NF, has alone discovered 2200 acres of high-quality old growth on 11 sites that are in the timber base. Nantahala NF includes the 14,000-acre Big Ivy area, little studied but thought to be rich in old growth. FS has halted cutting until 1997 when the Forest Management Plan will be revised (9).

A Florida site illustrates mismanagement as a threat. Fire exclusion has allowed an old-growth Longleaf Pine stand, possibly 60 acres in size, within Rocky Bayou State Recreation Area to be infiltrated by Sand Pine. Sand Pine, unlike Longleaf, burns catastrophically; and if Rocky Bayou catches fire now, the burning Sand Pine will kill the 200- to 400-year-old Longleaf. The site is owned by FS but used and managed by the state of Florida. The state's resource management auditor is recommending the Sand Pine be cut and fires reintroduced, but neighbors' fear of smoke may prevent setting the fires during the appropriate season (10). Another threat in Florida at this writing is the possibility that the governor will sign a bill allowing residents to "trim" mangrove swamps less than 75 feet, and in some cases less than 425 feet, in width on their property and on state lands waterwards. Florida has almost 500,000 acres of mangrove swamps, a substantial portion unlogged (11).

SOUTH-CENTRAL

The Missouri Highway Department plans to build a road through St. Louis County's Creve Coeur Lake Memorial Park, which would destroy 25 acres of old-growth oak on a steep bluff. Chinquapin Resistance is publicizing the threat, and the Sierra Club is preparing to sue if construction plans go forward (12).

In Missouri's Mark Twain National Forest, with many scattered patches of dry old growth dominated by Post Oak and Chinquapin Oak, FS is "consolidating" old growth. Areas that FS now designates as old growth are likely to include some patches of actual old growth and some of young trees. Actual old growth outside the designated areas is subject to logging. Heartwood appeals sales on the Mark Twain NF (13).

The Buffalo Ranger District of Ozark National Forest in Arkansas is the site of thousands and thousands of acres of endangered old growth, the Newton County Wildlife Association reports. The mixed hardwood forest on the Little Buffalo, Big Buffalo, and Piney drainages may have been high-graded for walnut, cherry, basswood, and cedar, but otherwise they are substantially intact (see *Wild Earth*, spring 1993). FS disagrees and is logging, particularly on the ridges. The Wildlife Association is considering its options (14).

In Oklahoma, thousands and thousands of acres of threatened old growth exist on private lands. David Stahle and Matt Therrell tested an ancient forest predictive model to estimate the extent of Post Oak old growth in southern Osage County. The model proved to be 73% accurate, which translated into 35 square miles of old growth. Stahle and Therrell have actually mapped 15 of the 35 square miles; in the process they identified nine areas over one square mile in size, and found at least 90% of the areas they mapped to be largely untouched. Some of the old growth is in the hands of private owners who appreciate it; but elsewhere, would-be ranchers spray with herbicides, and developers cut the old growth to prepare housing lots around the area's lakes. Stahle is trying to interest The Nature Conservancy and others in buying the ancient forest to protect it. Similar Post Oak old growth exists in other parts of eastern Oklahoma and in northern and central Texas, and much of it is undoubtedly also threatened (15).

Kentuckians are struggling to purchase Blanton Forest, 2350 acres of mostly old growth, and 4350 acres of buffer. The old growth, which includes hemlock/mixed mesophytic, oak/pine, and Appalachian oak forest, was discovered in 1992. The price of the 6700 acres is $4 million. The Kentucky General Assembly will pay $500,000; the Kentucky State Nature Preserves Commission, which would own the land, $500,000; citizens must raise $3 million. The Blanton Forest Trust is receiving donations (16).

Old growth in Kentucky's Daniel Boone National Forest also needs support. Tight Hollow and the Right Fork of Elisha Creek are still in the process of becoming Research Natural Areas, and numerous small old-growth sites—ridge forest and ravine forest—are scattered across the Daniel Boone awaiting mapping as well as protection (17). WERF

References

[Research results are based on personal communication with these sources.]

(1) Bruce Kershner (Friends of the Allegany, 353 Fruitwood Drive, Williamsville, NY 14421).
(2) Duncan Buell (Coalition to Save Belt Woods, Box 1023, Bowie, MD 20715).
(3) Doug Cornett (Northwoods Wilderness Recovery, POB 122, Marquette, MI 49855).
(4) Dave Zaber (SWAN, 5301 Updyke Road, Grass Lake, MI 49240).
(5) Mike Biltonen (Minnesota Ecosystems Recovery Project, POB 293, Redwing, MN 55066; 612-385-7512).
(6) Bill Moorehad, Virginia Division of Natural Heritage.
(7) Nancy Ross and Steve Croy, US Forest Service.
(8) Robert Mueller (Virginians for Wilderness, c/o Steve Krichbaum, 412 Carter Street, Staunton, VA 24401-2221; 704-886-1584).
(9) Norma Ivey (Western North Carolina Alliance, 70 Woodfin Place, Suite 03, Asheville, NC 28801; 704-258-8737).
(10) Erik Johnson, Florida Park Service.
(11) James W. Beever III.
(12) Eric Hempel (Chinquapin Resistance, c/o SEAC, 720 Interdrive #1S, St. Louis, MO 63130; 314-725-6299).
(13) Charles Phillips (Ozark Heartwood, 1407 Santa Fe Trail, Boonville, MO 65233-2015; 816-882-8482).
(14) Kent Bonar (Newton County Wildlife Association, c/o Steve Culver, HCR #62, Box 665, Deer, AR 72628; 501-428-5800).
(15) David Stahle (Tree Ring Laboratory, University of Arkansas, 108A Ozark Hall, Fayetteville, AR 72701).
(16) Teresa Libby (Blanton Forest Trust, 433 Chestnut Street, Berea, KY 40403; 606-986-2372). Checks should be made out to the Trust.
(17) Paul Kalisz, University of Kentucky. For further information, Forest Watch, c/o Appalachia-Science in the Public Interest, Route 5, Box 423, Livingston, KY 40445.

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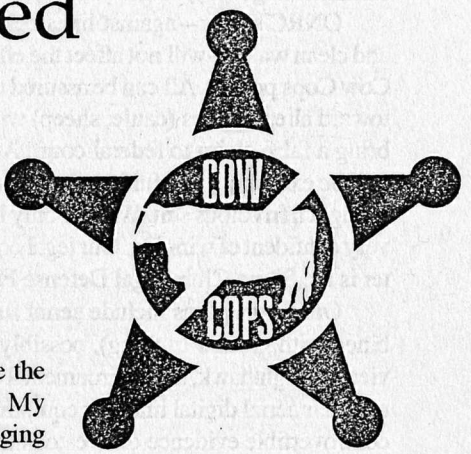
Conservationists Conceive Cow Cops, Copious Concerns Corralled



by Andy Kerr

I knew we'd struck a nerve when the Grant County Stockgrowers threatened to have the sheriff arrest anyone from ONRC caught counting livestock on federal public lands. My realization was confirmed when the Governor of Oregon, while grudgingly acknowledging our legal right to do so, pointedly asked us not to monitor compliance with federal livestock grazing permits on public lands.

Much raging on the range has arisen from ONRC's new "Cow Cops" project. Anxiety in the livestock industry and federal land management agencies seems unduly high and premature, since we have just announced the project and have yet to implement it on any large scale. Moreover, the Oregon Natural Resources Council is just a law and order organization.

Cow Cops arises out of ONRC's belief that permitted livestock numbers are routinely being exceeded by many operators, resulting in even more grassland deterioration than allowed for under federal management plans. But belief is one thing and evidence is quite another.

ONRC is training volunteers to monitor range allotments throughout the Forest Service and Bureau of Land Management holdings of Oregon. These volunteers aren't qualified and won't attempt to assess range condition and forage utilization. We are simply training them to review grazing permits, determine how many animal units are allowed between which dates, and then investigate whether the permittee is complying with the terms of the permit.

Our volunteers' tasks are straightforward:

(1) Visit the allotment before turn-out date to see if the permittee has jumped the gun.

(2) Visit the allotment during the permitted grazing season to see if the permittee has more animal units than allowed.

(3) Visit the allotment after the termination of the grazing season to determine if the permittee has promptly removed the animals.

Anyone who can count, read a calendar, and learn to identify cattle markings through field glasses (not unlike learning to identify birds by their markings) can do the job.

We are instructing the volunteers to respect private property and permittees and to avoid harassing the livestock in any way. We also instruct them to avoid confrontation in the field. (We did dispatch ONRC Northeast Field Representative Tim Lillebo to count cows in Grant County, but the stockgrowers didn't show; the sheriff, state police, and district attorney had informed them about public lands and the First Amendment.)

When ONRC gathers strong and convincing evidence of livestock trespass on public lands, we will first notify the appropriate land management agency. If no action is taken, we may file a lawsuit against the trespasser under provisions of the Federal False Claims Act, the statute aimed at fraud against taxpayers. Any party who knows of a false claim being made to the government (like understating how many animals one has grazing on public lands or the time interval they are there) can sue the criminal making the false claim.

After the suit is filed, it is under seal for 30 days, allowing the government the opportunity to prosecute the trespass. If the government fails to do its job, ONRC may pursue the matter. The law provides up to triple damages (which would be based on the fair market value of the animal unit months of forage, not the subsidized government range fee), attorneys fees, and costs.

ONRC's bias—against livestock and for wildlife and clean water—will not affect the effectiveness of our Cow Cops project. All can be assured that our antipathy toward alien species (cattle, sheep) will not tempt us to bring a false claim to federal court. As always, ONRC will be extremely careful in bringing suit. We've never brought a frivolous suit. We will only bring suits we are very confident of winning. Our legal counsel in this matter is the Sierra Club Legal Defense Fund.

Our future plans include aerial surveillance (combined with ground-truthing), possibly through the services of Lighthawk, the environmental air force. We may use their aerial digital imaging equipment to provide incontrovertible evidence of livestock trespass, with precise spatial and temporal coordinates.

ONRC favors the end of livestock grazing on federal lands. The ecological and economic costs of livestock grazing public lands are far in excess of any social benefit. The activity is heavily subsidized by the American taxpayer. We believe that public lands should provide public benefits such as clean water, wildlife and recreation; and that the private lands ought to grow our food and fiber in sustainable and environmentally compatible ways.

ONRC seeks a compassionate end to this environmentally and economically destructive activity. Our proposal is that livestock grazing on federal lands be phased out over ten years, with free-grazing in the interim. We support a buy-out of federal livestock grazing permits at fair market value for permittees who wish to sell, using federal tax dollars saved by not subsidizing such grazing.

But until the day that livestock no longer foul the public lands and waters, we will work to ensure that livestock grazing is done legally under terms of official land and resource management plans. If such grazing is being done accordingly, then the permittee has nothing to fear from Cow Cops.

Andy Kerr is Executive Director of the Oregon Natural Resources Council. A native Oregonian, he's been with ONRC 20 years and still hopes for the day he can throw his sleeping bag down anywhere on the public lands without its landing in cow shit. For more information on Cow Cops, contact Mark Hubbard, Conservation Director, ONRC, 522 SW 5th Avenue, Suite 1050, Portland, OR 97204 (503) 223-9001 x211, mh@onrc.org.

A Pagan Canticle

This poem is dedicated to William Everson, George Oppen and Sam Moore

Clap your castle gates & unhinge the heavenly armor,
you knights & bishops—the checkmate age of

the sky gods gone. No lords. No kings & queens
for rather than our kind's royal fist, each beetle

a princely piece, each spider a princess, not
caught in the web but spinning free silk

from her own divine innards. This canticle
isn't to sing praises on high but here below

embedded in the thick mud of the mystery
may be honor the making & the yet unmade,

all of us kin, co-creators in conversation with
the light & rhizomes rooted in the deeper dark.

Life springing full-blown from the mind of matter.
Each breath another incantation, sucking

air
& releasing the lyric valuables.

—Lone Cone Free Poem

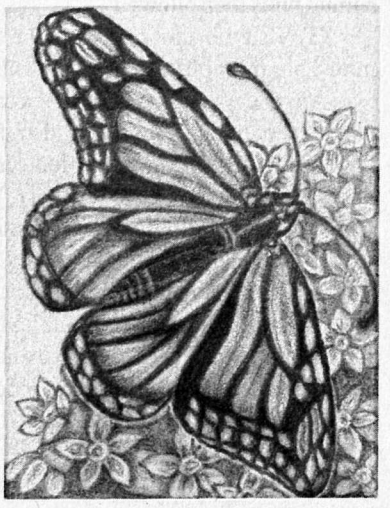


illustration by Kim Jensen

Fending off SLAPPs

*What to do When the Empire Strikes Back**

It should come as no surprise in this neo-conservative last expiration of the 20th century that the corporate machine has learned well since the first Earth Day. They've developed a slew of legal maneuvers to stop environmental activists cold—ranging from threats of audits by the IRS to menacing phone calls late at night. The high and mighty find that force and intimidation ("carry a big stick!") can be effective against citizens who have the audacity to insist on their rights.

A favorite means of intimidation used by the powerful is the law. US law has always favored the moneyed elite; and environmental villains have not been shy in using legal mechanisms to harass and silence their opponents. A major misuse of the law aimed at environmental activists is the SLAPP: Strategic Lawsuit Against Public Participation.

Activists have been hit by several thousand SLAPPs in the last decade or so. A few SLAPPs have been won by the citizens who were sued, including ones against the League of Women Voters who spoke out against a condominium project in the Los Angeles area, against people who voiced their opinions about preserving wilderness areas, against people who complained about the pollution from a company killing fish, and even against parents who spoke out in favor of better child care. Basically, SLAPPs can and do occur in any area where a citizen speaks out about a project or activity of someone who is making money.

There is a disturbing trend in America to view property ownership as the most sacred and inviolate of all constitutional rights. Many developers (including ranchers, miners, and loggers) actually believe that the destruction of the environment is justified by short-term profits. SLAPPs are the new legal weapon of choice of these unscrupulous sleazebags intent on squelching the voice of opposition: us. (Not that we don't recognize the ancient and vital rights associated with private property, but to run rough-shod over the rest of the Constitution while hacking up America's remnant wildlands is downright unpatriotic!)

As an example of a SLAPP, when someone speaks out against a company that wants to build a garbage incinerator in the neighborhood, the incinerator company may sue that person for slander and interference with contractual relations. Because most grassroots activists do not have much money, just fighting a SLAPP to the point of having it dismissed in court can bankrupt them. The aim of SLAPPs is to occupy the time, money, and emotions of the activists with the lawsuit against them so that they cannot fight the proposed project; fighting even an obviously frivolous SLAPP can take months or years, cost tens of thousands of dollars, and involve intense mental anguish. Even if it loses the SLAPP, the company wins because it crippled its opposition with what is to it a minimal cost in crafty lawyers.

Freedom cannot exist in a muzzled world. Free people must speak to each other and hear each other—they must test and protest and raise hell and shake their leaders by the napes of their necks.

—Gerry Spence[1]

by Ned Mudd II and Ray Vaughan

Part Five: The Gonzo Guide to Environmental Law,

*First, the mandatory legal disclaimer: nothing in this article is intended to be legal advice to you. Due to the complexities of the law and of each individual situation, no book, article, or anything else can substitute for legal advice from a real attorney familiar with the facts of your case.

Broadly speaking, SLAPPs aim to quiet public debate on policy issues by using the courts to turn that debate into a private controversy between litigants. Courts are not designed to resolve political issues and should not be used as such. Abuse of the legal system by powerful, moneyed interests should not be tolerated. The Supreme Court of Colorado has adopted rules to make the dismissal of SLAPPs easier and swifter; people i other states should demand that their state legislatures and state supreme courts[2] adopt similar rules regarding SLAPPs.

The most persistent activists can beat the SLAPP then turn around and sue the company back for abuse of process, malicious prosecution, defamation, and intentional infliction of mental anguish. Occasionally activists win huge jury verdicts, in the millions of dollars range. The Sierra Club and a group of individuals who opposed a resort development in Squaw Valley, California, recently received a $2.4 million settlement from the developer. The developer sued the individuals for $75 million for alleged losses due to delays in the project while they opposed the needed permits; the Club was later added as a party. After the developer's suit was dismissed, the Club and allies sued, and the developer agreed to settle the case for $2.4 million. As part of the settlement agreement, the lawyers from both sides were allowed to present their versions of what happened in articles in the Sierra Club's magazine *Sierra*; it makes for fascinating reading about how two sets of lawyers can see the same facts so differently.[3]

Cases to fight back against a SLAPP, however, also take lots of time and money. Corporations continue to attempt to silence their opposition with SLAPPs because they are usually successful in breaking the spirit of the activists, who agree to drop their opposition to the company's plans in return for the company's dropping the lawsuit. Corporations have large amounts of money, and suing citizens to shut them up is much less expensive to many companies than actually fixing their problems.

So, what to do when it's just you and your friends standing between a free-flowing river and the destroyers and they hit you with a Strategic Lawsuit Against Public Participation?

Remember these things:

1. SLAPPs are designed to intimidate you. If you cave in, they succeed.

2. SLAPPs are attempts to stifle your rights to free speech and to petition your government for a redress of grievances.

3. SLAPPs have not fared well in courts. Assuming you have not violated some other law during your crusade, you'll probably win. The down side is that you'll need a lawyer, money, and courage to do so. The goons who file a SLAPP know they will probably lose if the case goes the distance; they

illustration by Mark Armstrong

are counting on you surrendering long before the case is heard on its merits. Corporations can afford to keep lawyers busy burying you in a blizzard of harassing paper and humiliating questions about every detail of your life. Many people hit with a SLAPP do succumb to the pressure and the financial and emotional burdens, and they sign settlements that get them out of the SLAPP but that also prohibit them from exercising their rights to question environmentally destructive actions.

4. You can always SLAPP BACK. Same caveat: that takes legal help; and you know what that means—$$$$. Again, though, you can receive significant money damages if you prevail.

5. Consider whether you are judgment proof. That simply means that you can't be made to pay damages to the company because you're broke. Corporations cannot understand those eco-warriors who live on a shoestring and never accumulate assets, and courts cannot deprive you of a minimal maintenance level of income and property. Nor can a court send you to jail for not paying a civil debt, which is what a judgment in a SLAPP would be. If you have no large assets, the most the company can normally get is a 20-year lien on your assets and income; if your assets rise above poverty level during that time, the company can get some (assuming it bothers to keep track of you for that long). Thus, if all you ever plan to have is just enough to get by, the bad guys can't really touch you with a SLAPP.

6. Make sure that no one in your group mouths off about your opponent's reputation unless he or she can absolutely back up the accusations with cold, hard data. To the extent that you leave the personal life of your opponents out of your crusade, you're that much more protected. In essence, lay off the slander, unless you enjoy being served with lawsuits and invited to court.

It's fine to call the Army Corps a bunch of dimwits; they're your public servants. Just be careful about those well-connected, private citizens. Also, make sure that you separate your opinions from your allegations of fact. Saying that you think all developers are greedheads is very different in the law's eyes from saying that developer Ripper Moore is on the take. Opinion is not defamation, but when there is a fine line between the two, you can get in trouble; so be careful.

Also, it's reasonable to voice your concerns about the environmental and social effects of a proposed project. Now we're back to simple free speech issues. Even hard-core Republican judges feel deep-rooted sentiment for free speech—especially if you aim it at federal agencies.

7. As usual, try to befriend a local sympathetic lawyer who can lend advice and even pro-bono help if needed. As we've said before, it isn't smart to argue your own case. Judges don't like it, and you'll give the opposing (corporate or government) attorneys a fine opportunity to run you into the ground. Generate a nice file on the project (see Gonzo Guide Part III, *Wild Earth* summer 1994), and show it to the sympathetic attorney. Ask your lawyer friend about Rule 11: SLAPPs are an abuse of the legal process and, on a case by case basis, could be illegal.

The nation's foremost experts on SLAPPs are law professor George Pring and sociology professor Penelope Canan of the University of Denver. They have tracked Strategic Lawsuits Against Public Participation in the United States as part of a national, interdisciplinary study sponsored by the National Science Foundation. Their studies show that most such lawsuits are indeed thrown out of court but that the average case lasts for three years. For more information about SLAPPs, contact Professor Pring at the University of Denver, College of Law, 1900 Olive Street, Denver, Colorado 80220; (303) 871-6266.

According to Professors Pring and Canan, 71% of all SLAPPs are against citizens who contacted a government agency about a project or activity that some third party needed approved by that agency. They advise anyone who is threatened with a SLAPP or is actually sued to do the following:

- Contact a lawyer and tell her or him that you are the subject of a SLAPP; mention specifically that your right to free speech and right to petition are being attacked. Contact the local branch of the American Civil Liberties Union; the ACLU has handled a number of SLAPP cases. If you have a good environmental lawyer working on your issue already, perhaps he or she would represent you; the huge potential monetary recovery from a SLAPP-back suit should make most lawyers interested.
- Tell your lawyer to contact Professors Pring and Canan for detailed information on SLAPPs.
- Talk with your lawyer about a swift motion to dismiss based upon your federal and state constitutional rights.
- Consider counter-suing for the violations to your constitutional rights. If you have the stomach and the patience for it, a SLAPP-back could earn you and your attorney millions of dollars and send a signal to those who would abuse the legal system that such conduct will not be tolerated. Also, it will make future activists less likely to be SLAPPed.[4]

Finally, whenever attacked, be firm, showing no signs of intimidation. Take the offensive. WERF

Notes

1. Spence, *With Justice For None*, 296 (Penguin Books, 1989).
2. Some states have legal rules of court set by the legislature and some have rules adopted by the state's highest court. Where the rules are adopted by the state supreme court, there is usually a mechanism whereby the public can petition the court to adopt rules, such as new rules on SLAPPs.
3. "Club SLAPPs Back," and "Developer Sued Opponents Because It Believed They Failed to Honor Their Word," 78 *Sierra* 96 (No. 4, July/Aug. 1993).
4. All these points and many others are covered in the professors' papers "Citizens' Rights—Communicating with Government" and "Strategic Lawsuits Against Public Participation," 35 Social Problems 506 (No. 5, Dec. 1988). These articles are available from the address above.

Ned Mudd II and Ray Vaughan are environmental attorneys in Alabama and regular Wild Earth contributors.

Using Conservation Easements In Creating Regional Reserve Systems

by Brian Dunkiel

INTRODUCTION

Today land trusts own easements on millions of acres of valuable ecosystems. These easements protect an area larger than the states of Massachusetts, Connecticut, and Rhode Island combined (Diehl & Thomas 1988). Conservation easements are voluntary agreements that limit land use to low impact activities and thus protect wildlands, scenic views, and historic areas. This article explains what conservation easements are and how they are created. It also outlines a role they can play in implementing The Wildlands Project.

The legal development of conservation easements is quite complicated and not entirely relevant to the protection of wild areas. It is therefore beyond the scope of this article. The discussion will, however, sketch out those legal concepts necessary for wilderness proponents to know.

PROPERTY RIGHTS AND LAND TRUSTS

To understand conservation easements some knowledge of property law is helpful. Property ownership is commonly analogized to a bundle of sticks. Each stick in the bundle represents a right connected to owning property (such as the right to harvest timber). An owner of property in fee simple owns all the sticks associated with property ownership (Donahue 1993).

A conservation easement generally means that the property owner sells (or, preferably, donates) some of the "sticks" or property rights to a land trust organization. A land trust is a "local, state, or regional non-profit organization directly involved in protecting land for its natural, recreational, scenic, historical, or productive value" (Land Trust Alliance 1990). Most land trust organizations, such as The Nature Conservancy (TNC), are private, non-profit corporations. A land trust can tailor its work to fit a particular area. The Jackson Hole Land Trust, for example, concentrates its efforts on protecting land surrounding Grand Teton National Park (Land Trust Alliance 1990).

The rights acquired by land trusts may restrict timber harvests, limit land use to agriculture, preserve sensitive ecosystems or even prohibit all human activities on the land. These types of conservation easements restricting the activities that may be conducted on a given piece of property are types of negative easement (Kornfeld 1993). The owner of an affirmative easement, in contrast, possesses the right to use land for specific purposes, such as crossing property for recreational pursuits (Kornfeld 1993).

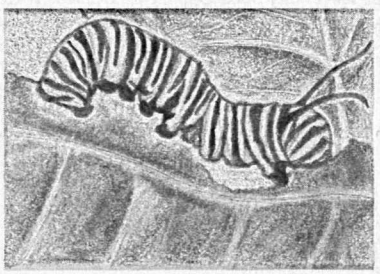


illustration by Kim Jensen

Many land owners favor conservation easements because they can thus continue to own their property even while ensuring its lasting protection. The property remains private in all respects and the title is marketable. Some land trusts have struggled with the issue of whether fee simple ownership of real property is more desirable than a conservation easement that acquires development rights only. This issue, however, is often resolved by the land owners concluding that easements are preferable because the property remains private, and they can continue to live on it. Such retention of private property fits well with The Wildlands Project Mission Statement which declares, "Jobs will be created, not lost; land will be given freely, not taken" (*Wild Earth* Special Issue 1992).

ISSUES TO CONSIDER WHEN USING CONSERVATION EASEMENTS

Although they are not usually the motivation for protecting land, federal government tax policies, to an extent, support the protection of land by conservation easement. A donation to a land trust may yield income, estate, gift and property tax benefits. To qualify for such benefits, the property owner must donate an interest in land exclusively for conservation purposes in perpetuity to a qualified organization. The IRS defines "exclusively for conservation purposes" as preservation of land areas for (1) outdoor recreation or education by the general public; (2) protection of a relatively natural wildlife habitat; (3) historic purposes; and (4) preservation of open space (including farmland and forest) where such preservation is for scenic enjoyment or pursuant to a local government policy (Internal Revenue Code). Under federal law, a qualified organization can be a public agency, a land trust or another preservation organization. A private organization must clearly articulate a commitment to protect and enforce conservation values in its articles of incorporation or bylaws.

A key concern for the individual donating the easement (the grantor) is that the organization (the grantee) be able and determined to enforce the restrictions placed on the land in the future. For example, if the grantor donated to a land trust the right to build roads on a piece of property that contained critical habitat, then only the land trust has the right to build roads on that land. Since building roads would violate the trust's articles of incorporation and bylaws, that land is theoretically protected from road development forever. If the grantor sells the property and the subsequent owner attempts to build a road in the protected area, it is the land trust's responsibility to enforce its conservation easement on the subsequent owner.

It is thus in a potential grantor's interest to make sure beforehand that the organization to which she is considering granting an easement can and will enforce the easements in court if necessary. An effective land trust will have a strong monitoring program.

Limits on Protection

Conservation easements do not offer absolute legal protection. They may be vulnerable to legal action taken under the doctrines of changed conditions and eminent domain. The doctrine of changed conditions is based on the assumption that the uses of land change over time. If the use of the land surrounding the property with the conservation easement changes so as to make impossible the original purpose of the easement, it may become unenforceable or be terminated. It is unclear from the case law whether the doctrine of changed conditions applies to conservation easements (Blackie 1989). A conservation easement may be terminated under the doctrine of eminent domain if the government needs to acquire the private property for a public purpose (Land Trust Alliance 1990).

A conservation easement may also be terminated by foreclosure resulting from an unpaid mortgage, unpaid property taxes or other debt. Although the law varies by state, foreclosure generally will not extinguish the easement if the lender had knowledge of the easement before making the loan. Land trusts can avoid these threats by working only with land that has no lien holder and has a source of funding to pay future taxes (Land Trust Alliance 1990).

Conservation Easement Protection Versus Statutory Protection

Conservation easement is potentially the best legal device for habitat protection that wildland proponents currently have at their disposal. It may be stronger than statutory protection, such as Wilderness designation or de facto protection by such federal laws as the Endangered Species Act. Statutory protection is contingent upon legislative bodies; if political sentiment becomes anti-environmental, then legislatures can weaken statutory environmental protection. Moreover, statutes must be enforced, and appropriations for enforcement can be cut.

Conservation easements last because in most cases the land is freely given and legal title remains in private ownership. When the protected land is passed on, the subsequent owner has notice that the land is restricted to certain uses, for the easement is recorded with the deed to the land. Therefore, only an individual who has similar respect for the land will purchase the protected property.

Conservation easements have been used to limit land use for about as long as land use statutes have been held constitutional (*Euclid v. Ambler Realty Co.* 1926). The federal government has used conservation easements since the 1930s to protect farm land, and has similarly protected approximately 1.3 million acres of wildlife habitat. In addition, nine states currently have programs to protect land by conservation easement (Wright 1993).

LAND TRUST ALLIANCE

The Land Trust Alliance (LTA) is the national organization of land trusts. Through the Alliance, these grassroots organizations enhance their ability to protect land—by learning from one another, gaining access to vital information and technical expertise, building public awareness about their work, and acquiring financial and political support for their open space protection. Established by land trusts in 1982, LTA serves as an educator, coordinator, leader, and advisor. Land Trust Allianceis a nonprofit organization, governed by a board of directors, and supported by hundreds of member land trusts, as well as by foundations, corporations, and individual donors.

Land Trusts: the fastest growing part of the conservation movement

Land trusts are local, independent nonprofit organizations that help protect land important to the environmental health of their communities, states, or regions. Close to 1100 separate land trust organizations, with a combined membership of 900,000 people, are saving land throughout the country. Operating in all 50 states, they have helped conserve more than 4 million acres of wetlands and wildlife habitat, trails and recreational areas, scenic lands, urban gardens and parks, productive farm and forest land, and fragile natural areas. [This does not include acreage preserved by The Nature Conservancy, which has saved another 8 million acres.]

Land trusts are the fastest growing part of the conservation movement, with new land trusts forming at the rate of about one a week. They are at the vanguard of the trend toward local self-sufficiency and individual action to solve important social problems.

Land Trust Alliance roles

Operating from our small national office in Washington, DC, we work to ensure that land trusts have the information, skills, and resources they need to save land. Our programs include:

- *Exchange*, a quarterly professional journal of land conservation, which reaches land trust staff, board members, volunteers, and other conservationists with practical advice on how to save land, run an organization, and educate the public on natural resource protection.
- *LTA Landscape*, a newsletter that gives land trusts timely information on events and issues affecting them.
- Books and other publications on tools for saving land, legal and tax aspects of conserving and managing land, and methods of starting and running a land trust.
- Information Center. We answer more than 1500 information requests each year from land trusts and individuals, often by linking together people and organizations with similar experience.
- Public education. In partnership with land trusts, we work to educate the public about the work land trusts do, and how people can participate in conserving land. Through media contacts, audio-visuals, and assistance to land trusts, we make the special advantages of land trusts and voluntary land conservation better understood. For example, our guidebook on conservation options for private properties has been widely used by land trusts to educate landowners .
- National conferences. Our annual National Land Trust Rally, which attracts nearly 700 participants, offers workshops and networking opportunities to land trust staff, volunteers, and other land conservationists.
- Standards and Practices. In consultation with land trusts across the country, LTA has developed a set of essential policies and procedures to ensure that land trusts' operations and land transactions are fundamentally sound. Our *Guidebook to Standards and Practices* provides land trusts with comprehensive information to help them adhere to the standards and practices, both in operating their organizations and conducting their conservation projects.
- Public policy. We promote national policies that support land conservation, especially those that foster public-private partnerships and that increase resources and incentives for protection of privately owned land.
- Regional outreach. Where numbers of land trusts are large or rapidly expanding, land trusts need information tailored to their area, networking on regional issues, and public policy coordination on state or local issues. In response, in 1993 LTA established a field program in New York State, and in 1995 established a program in the Northwest. Our National Land Trust Council also helps us stay in touch with regional needs and trends of land trusts.

For more information contact Land Trust Alliance, 1319 F St. NW, Suite 501, Washington, DC 20004-1106; 202-638-4725.

CONSERVATION EASEMENTS AND THE WILDLANDS PROJECT

The Wildlands Project is a long-term wilderness recovery strategy for North America. The project is designing regional reserve systems based on conservation biology principles. The reserve system model consists of core reserves surrounded by multiple-use (buffer) zones and connected by wildlife passage corridors.

Conservation easements should be used to implement portions of The Wildlands Project. Conservation easements could limit land use to protect core reserves, buffer zones, and wildlife migration paths connecting core reserves. For example, an easement on a core reserve could be crafted to permit only low impact activities such as hiking or to prohibit human activity altogether. Conservation easements on buffer zones could prohibit industrial activities but permit comparatively benign uses such as organic farming. Easements could even specify the farming practices permitted in the buffer zones. Conservation easements on connecting corridors could permit specified activities compatible with wildlife inhabitation and passage.

The first step in using conservation easements to help implement The Wildlands Project should be to map all protected land throughout North America, including land protected by private land trusts, as well as local, state, and federal government agencies. There is not, at this time, one map of all the land protected in perpetuity. Many land trusts, though, do have maps of their local areas.

Wildlands Project preliminary maps of regional reserve systems have located many core reserves in existing National Parks, National Forests, and Wilderness Areas. Some of the land surrounding the proposed core reserves may already be protected. For example, the Jackson Hole Land Trust may have in effect begun to establish a buffer zone around Grand Teton National Park—which would be a core reserve.

Wildlands Project supporters should work with their local land trust. The work of two or three wilderness activists can significantly affect a land trust's goals and mission. Most land trusts are small non-profits and may have only five to eleven people on their boards of directors. By taking active part in a land trust, wilderness proponents can influence the trust's project selection criteria and easement design. Most land trusts have written guidelines under which they select projects and craft easements. If those active in a land trust value vistas, then they select projects and craft easements that preserve scenic views. Scenic views often encompass valuable ecosystems, so the land trust may already be helping establish a wild core, buffer zone, or corridor. Moreover, those who created the land trust may also value wild areas and might agree to incorporate selection criteria that further the regional reserve system plan. By getting involved, wilderness activists can draft explicit project selection criteria targeting core reserves, buffer zones, or corridors.

Swainson's Hawk (Buteo swainsoni) *by Paola Berthoin*

Meanwhile, *Wild Earth* and The Wildlands Project should look into teaching a seminar at each annual Land Trust National Rally (1995: October in California). This would be a quick and inexpensive way to reach those who currently protect land and educate them about regional reserve systems.

CONCLUSION

Conservation easements should be utilized in returning this continent to its wilderness origins. A well-written easement is strong and perpetual (and it takes only one lawyer to write). Protection of vast areas could be completed through hard work by local wilderness activists without government assistance or interference. Wildland proponents interested in learning more about conservation easements should read *The Conservation Easement Handbook* by Janet Diehl and Thomas Barrett (Land Trust Alliance 1988). WERF

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Reinhabiting the Community of Life

Fostering a New Economic Paradigm

second of two parts
by Chris van Daalen

ECONOMICS FOR THE ENVIRONMENT

Various approaches have been suggested for redirecting the economy toward protecting the environment and community rather than destroying them. These might be broadly classed into (1) environmental advocacy that employs economic arguments, (2) environmental economics, and (3) ecological economics. *Wild Earth* readers are probably most familiar with the first, exemplified by efforts of forest groups to end below-cost timber sales. These timber subsidies foster unfair competition against private landowners, cause job elimination through exports and automation, and bolster short-term corporate profits at the expense of ecosystems. Environmental economists take a more disciplinary approach to exposing the hidden costs of industrial exploitation. Within the context of conventional economic theory, they have developed a set of formulaic evaluation methods to "put a price tag" on environmental "goods" like clean water, and to show the full costs of environmental "bads" like water pollution. They hope to create economic incentives that will encourage companies and society as a whole to protect the environment. Ecological economists go beyond these methods to critique and replace the conventional economic theories of modern capitalism that rationalize endless growth. They take a comprehensive approach to measuring economic prosperity, integrating environmental degradation into national accounts, acknowledging the rights of future generations, and recognizing the need for clear quantitative limits on economic activity.

Economists on every side of the environmental debate acknowledge that economic activities involve significant costs "that are not limited to those who choose to engage in them" (Daly and Cobb 1989). These costs, referred to as "externalities," fall outside of the system of accounting designed to compare the costs and benefits of doing business. Environmental economists strive to bring these externalities into the equation by charging companies for the pollution they produce. Tradable pollution permits and emissions taxes are examples of attempts to "internalize" the external costs of production. The assumption, based upon traditional market theory, is that if companies must pay more to pollute, they will invest in pollu-

illustration by Rob Messick

tion-saving devices and practices up until the cost of their investment equals the price of the tax or permit. Pollution will be reduced through market incentives, they assert. Another approach of environmental economists is to calculate the value of environmental benefits, such as recreational opportunities, by estimating consumers' "willingness to pay" for them. These value estimates can then be the basis of user fees to individuals or charges to industries despoiling the amenities. Both approaches involve the use of valuation methods to determine the dollar value of the natural resources in question.

THE ENVIRONMENTALISTS' DILEMMA

Both environmental economists and ecological economists suggest that the full costs of environmental degradation and the full value of the environment must be included in economic decision-making. Environmental economists generally stop short of questioning the basic assumptions of neoclassical economic theory, believing that the solutions exist within conventional means of measuring value. Yet what does it mean when we cite the "value" of the forest? Environmental economist Randall O'Toole has shown that an economic analysis of the values of the living forest can be a powerful argument for its preservation. He advocates changing the economic incentives faced by the managers of our public forests: First, remove the budgetary incentives that reward managers for "getting the cut out"; then, institute a system of recreation fees on public forests in order to reward managers (through their budgets) for preserving the aesthetic, recreational, and biological values the forests provide (O'Toole 1988). This represents an incentive approach based on—and limited by—consumers' willingness to pay for these benefits. O'Toole's economic approach reveals a critical dilemma we face in integrating an economic vision into our ecological vision.

Neil Evernden warns of the inherent danger of adopting a pragmatic, economic approach that "promotes the idea of beauty as simply another resource, like timber or mineral content; it is another material thing that can be utilized by humans" (24). Resourcism, as he calls it, is the use of pragmatic arguments, often geared to persuade an unsympathetic audience, that focus on the economic value of a healthy environment. Resourcism is based on the "assumption that human beings are the sole bearers and dispensers of value." Thus, when we cite the "value" of an environmental "resource" in economic terms, we run the risk of coopting our own effort by "adopting the strategy and assumptions of [our] opponents" (10). According to Evernden "the environmentalists' dilemma" originates from environmental strategies designed "to improve living standards without challenging the underlying beliefs." Deep ecologist Bill Devall writes that environmental groups who "use resourcism as their view of nature in political debates...help to legitimate the dominant view of the environment in modern societies." He acknowledges, however, "that for tactical purposes it is quite reasonable to use shallow reformist arguments in certain political campaigns" (pp. 25, 27).

Should we support the proposals of environmental economists to tax pollution and offer rewards for recycling? It is abundantly clear that society does not place enough value on the life support systems that make the economy possible. If we were to recognize the full value of those systems, not only would below-cost timber sales cease, but so would most other economic activity as it occurs in the world today. If it *is* possible to calculate a more realistic approximation of the environment's contribution to our livelihoods in economic terms, how can we cite that value while maintaining the argument that ecosystems and species have intrinsic value? Is there such a thing as a "deep" economic argument? To resolve this dilemma, we must ask ourselves what is the ultimate purpose of our campaign to protect the biosphere.

Reaching consensus on this purpose will remain elusive, but for the sake of encouraging dialog, I will hazard an attempt at making an informal statement of our underlying goals. We seek to cancel our date with impending ecological collapse, to perpetuate the evolutionary processes of all beings in the context of native ecosystems, and to ensure a future for the seventh generation and beyond. This demands a fundamental revision of our cultural conception of the role of *Homo sapiens* in the ecosystem and a radical shift in human activity away from exploitive domination to sustainable coexistence with and respect for the rights of all species. In short, we seek to reinhabit the community of life as equal members of that community rather than as supposedly separate and superior, and to redesign our human systems in accordance with ecological reality.

HOMO SAPIENS AS CONSUMER, RIGHTLY UNDERSTOOD

If a primary goal of the New Conservation Movement is to reinhabit the community of life in this way, then we must engage in a deliberate effort to redesign our human economic systems. The key to resolving the "environmentalists' dilemma" is envisioning and working toward a human economy that incorporates both economic and intrinsic value. To do so, we must first come to terms with our role as consumers. Once we accept this, we can begin to determine a mode of consumption that allows us to appropriately participate in the community of life, rather than consuming the community itself.

As members of the biotic community, we will continue to consume biomass, minerals and nutrients, air and water, and other produce of ecological systems, just as all secondary consumers do. To bring human activity in line with ecological carrying capacity, the central challenge is to recognize the distinction between the produce of the biosphere and the life-support systems that generate the Earth's abundance—the natural capital stock of the biosphere. This distinction, combined with a consideration of the ecological needs of all species, will indicate what we can sustainably consume. An industrial factory would not consider its machinery as a source of iron ore; nor can society dine upon its home for long.

In a natural ecosystem, the produce is allocated equitably and sustainably to different species through competition, scarcity, and ecosystem functions. Populations that overshoot their carrying capacity are quickly reigned in. Yet technology affords humans the unique ability to supersede the limits inherent to the ecological economy. If there are to be limits on our consumption and growth (short of ecological collapse), they must be self-imposed. If the "goods and services" of the biosphere are to be allocated equitably and sustainably among humans, other species, and the future generations of all species, a system of accounting must be devised that will enable us to make responsible decisions about the use and preservation of nature. Such a system must attempt to account for the full costs and benefits of each decision, from individual to global. To do so it is necessary to translate the environment, and the infinitude of its parts, into values within a common system of measurement so that the costs and benefits of various decisions and actions can be weighed against one another. The question still remains, of course, to what extent is such reductive measurement feasible and ethical? Yet, if we seek a comprehensive vision of an equitable and sustainable society, restrictive legislation will only define what we cannot do; an appropriate ecological accounting system is also necessary to determine what we *can* do. Devising such a system is the special purpose of ecological economics. Through this transdiscipline, we begin to see our human economy as merely a subset of the ecological economy.

"DEEPER" ECONOMICS

World Bank economist Herman Daly and Protestant theologian John Cobb have made a critical contribution to ecological economics with their 1989 book *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*. Their work begins to resolve the economic vs. intrinsic value dilemma by incorporating them both into an ecological economic vision. "Living things, individually and collectively, deserve consideration in their own right and should not be viewed merely as instrumental to human purposes. They are, certainly, resources for one another, and especially for human beings (who are also resources for one another). But their intrinsic value as well as their instrumental value must be considered." With this as an ethical bottom line, they acknowledge the need for economic accounting: "For purposes of economic or any other reflection, abstraction from the full richness of the natural world is necessary but abstractions need not be as misleading as those that have operated in economics during the past two centuries." They propose that instead of reducing all environmental costs and benefits to dollar amounts, as environmental economists have attempted to do, the values of resources and the costs of economic decisions should be expressed in terms of the amount of energy they represent.

In order to explain this biophysical theory of valuation, Daly and Cobb begin by suggesting that "if economists thought of physical things, such as trees and coal, as embodiments of energy, they would have to reflect on how useful energy is used up in [the processes of production and consumption]" (194). All productive capacity is ultimately based upon the energy embodied in natural resources. When a natural resource is transformed into a useful state, energy is expended

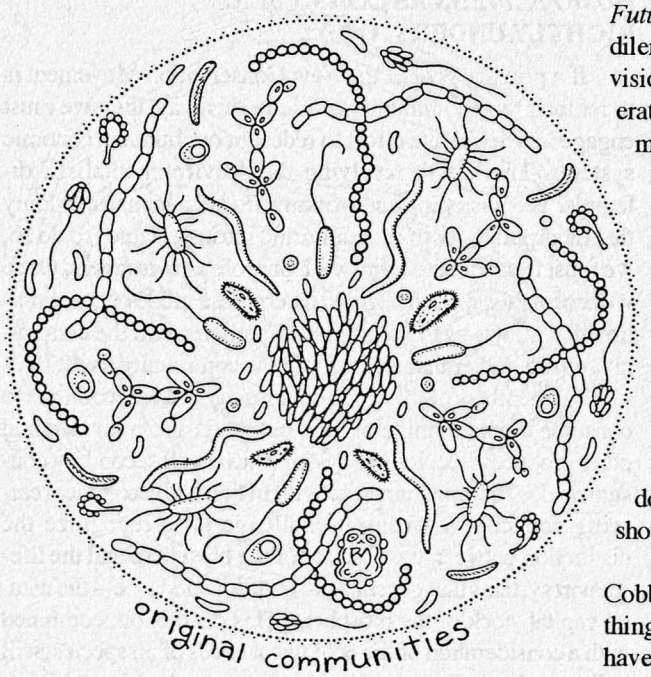

illustration by Rob Messick

indirectly in obtaining (e.g., mining) and transporting the resource, and directly, in consuming it. Since both direct and indirect energy use can be measured, the sustainability of the process can be determined without translating everything into dollar amounts. Daly and Cobb explain that "energy analysis allows us to see that a resource may be exhausted even when there are vast stocks in the ground, if the energy cost of extraction and processing exceeds the energy content of the unmined resource" (407).

Why is biophysical valuation a better approach to economic accounting than conventional means? Daly and Cobb explain that the conventional system has given us a false faith in the potential for unlimited growth. This faith emerged from "a peculiar period in history, during which energy was extremely cheap." Since we measure "progress" with money, rather than energy, society has been able to ignore the true costs. "But now," they argue, "that era is over, [and] the cost of all resources will increase because of the increasing energy costs of extraction and processing" (406). Biophysical valuation would help us emerge from that era: "A practical advantage of emphasizing energy...is that it more directly challenges the habit of mind that denies the reality of general shortages of natural resources" (193).

Ecological economists base their biophysical theory of valuation on the processes of the Earth, namely the flow of energy from primary producers (green plants) to consumers at all trophic levels, past, present, and future, rather than beginning with a human-conceived abstraction like "the profit motive" as neoclassical economists have done. Ecological economists would use energy flow analyses as models to shape market values. Incentive structures (pollution taxes or tradable pollution credits, deforestation levies, etc.) would be formulated to reflect the energy cost/benefit ratios, rather than being based on consumer choices, public surveys, or incomplete accounts of lost opportunity costs, as environmental economists favor.

Ultimately, the idea that both the instrumental and intrinsic "value" of the environment can be fully accounted for in the market is neither feasible nor ethical. Therefore, any incentive structure must explicitly accept that its cost/benefit analyses are imperfect at best. Dr. Robert Costanza, President of the International Society for Ecological Economics, explains that biophysical valuation is an "analysis [which] would allow valuation...of combined ecological and economic systems *as a complement to subjective evaluations*" (emphasis added). Daly and Cobb also emphasize the need for subjective evaluations and clear quantitative limits on the scale of the economy. "Imposing sustainable biophysical limits as a boundary on the market economy will lead to changes in market prices that reflect these newly imposed limits" (143). Adding the force of passion to their theories, they cite the "wild facts," abandoning the idea that their work should be "value-neutral," and take a strong ethical stand on behalf of human community, other species, and the rights of future generations.

FROM THEORY TO APPLICATION

Economics cannot be separated from politics or culture. In the first article of this two-part series ("Economics for the Community of Life," *Wild Earth* spring 1995), I discussed an integrated economic and political strategy to overturn the prevailing profit-driven economic paradigm. I showed that without revitalizing the democratic practices of citizen participation and cooperative, community-based economic development, no new theories, much less new preservation laws, could be successfully implemented. The "deeper" economics of Costanza, Daly, and the like seem equipped to inject a sense of ecological reality into the theories and assumptions that support the economic ivory tower. Yet, until natural resource-based communities embrace the idea that both human and ecological communities can be served by new approaches, they will remain trapped by the politics of gridlock and the slow death of nature that accompanies it. I have recently been involved in a unique effort that shows the difficulty and the hope of applying the ideas of ecological economics to a real economy.

The Washington Forestry Working Group met seven times during 1994 to develop "Incentives for Biodiversity, Landowner Profitability, and Value-Added Manufacturing." This was the subtitle of a report published by the Northwest Policy Center documenting the working group's discussions (entitled "Building Forest Wealth:...") Participants in the group represented local environmental groups, non-industrial forestland owners, large timber corporations, mill owners, rural communities, local rural government officials, and progressive silvicultural scientists. The process brought together groups often viewed as having conflicting goals and made them responsible for developing a common vision. They succeeded; while they did not reach consensus, they found common ground on incentives to reduce the pressures on landowners to harvest with short rotations, and to support ecosystem management and sustainable forestry practices. When it was over, each participant was empowered with tools to enhance her or his own agenda, and support the larger community's needs. It was cooperative politics in action.

Did it integrate the theories of Daly and Costanza? No, it was more akin to the proposals of O'Toole, yet there was something more. Instead of reducing every value to a dollar amount, the working group recognized a range of values, from financial to ecological to social, and made them subjects of a dynamic community discussion. Instead of churning out yet another inapplicable think-tank document, the working group designed a range of proposals to encourage landowners to *voluntarily* improve their practices. Two key tools the group identified are profitability and public recognition for responsible stewardship.

Some of the incentive proposals in the report would:

- reform tax structures, such as estate and capital gains taxes, to discourage conversion to non-forest uses and encourage longer rotations;

- enhance regulatory stability through long-term management permits, such as Habitat Conservation Plans;
- provide financial and technical assistance to cooperative ecosystem management activities;
- provide assistance to value-added products sectors.

Unfortunately, these proposals do not resolve the "environmentalists' dilemma," but they do reflect a growing consciousness among the many groups represented that economics can be redesigned to serve ecological and human communities simultaneously. The proposals do not integrate the biophysical theory of valuation and other ecological economics ideas for two reasons. First, the meetings were a political process among a diversity of interests; the group's members had a steep learning curve, and radically new ideas met with resistance. Yet the process did succeed in raising awareness and widening the range of acceptable approaches. Breakthrough thinking takes time. Second, ecological economic theories are still relatively esoteric, and not readily applicable in a combined economic, political, and scientific forum. To be implemented widely, practitioners must begin to learn and apply these theories, even if only in small ways.

Although their proposed changes are modest, the Forestry Working Group members are on the forefront of "a growing number of on-the-ground partnerships...[that are] helping to pioneer the concepts of watershed and ecosystem management, and to develop new, environmentally sound strategies for revitalizing resource-based economies." Environmental incentives are one valuable strategy for redesigning economies to benefit communities. Combined with the concepts of conservation biology, with the wisdom and myth of deep ecology, and with the practices of place-centered economics and inclusive democracy, these alternative economic strategies can help us to redesign our human systems in accordance with ecological reality. And the *trans*discipline of ecological economics encourages this combination. By bringing together the best science and ethics of these several approaches to the problem, we may embrace within our ecological vision an alternative economic model to enable *Homo sapiens* to reinhabit the community of life in its proper role.

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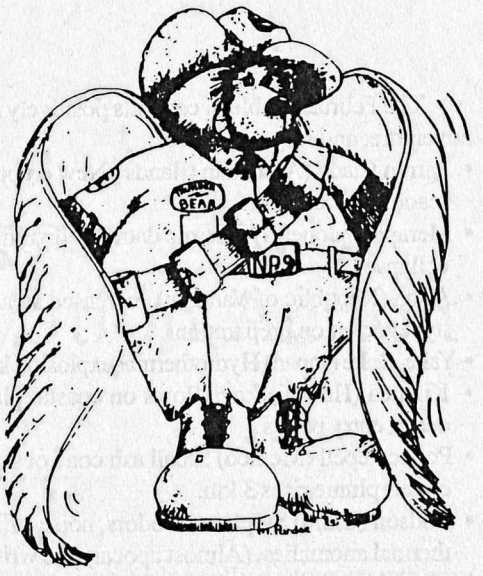
Caribouddism

1
The iceberg has come
to speak with Nanao.
She is just beyond the window,
waiting beyond the light.
She has come a long way.
She has a message for us.
She is very shy.
If we look directly at her
she begins to melt away,
all that she
has to say, lost
to the light of
day, the wind, the
rocks, our eyes—
She begins to speak.
We must listen
very carefully.

2
Tonight she comes as a
moose, no longer iceberg,
tiptoeing clumsily
between the tents.
She is happy in darkness.
She is looking for Nanao.
She wants to enter
his dreams.

3
Today she is standing
beside the road
in a patch of bog and
dirty snow.
She is the color of glacier,
iceberg, snow and
light.
She turns and
disappears,
into the woods.
She is caribou,
she is iceberg,
she is message,
and dream.

—Gary Lawless
Twillingate / Terra Nova / Gros Morne
Newfoundland 1995



The Decade Volcanoes

ALL MY LIFE, I HAVE ADMIRED VOLCANOES AND ENVIED THOSE WHO HAD THEM.

Perhaps it came of growing up on the plains of South Dakota, where a decent volcano chugging away would have broken the monotony and unutterable dullness of the place.

Countries that have volcanoes are full of color, creativity, and drama. Countries that don't have volcanoes, are, well, dull. Ireland doesn't have volcanoes; it's too poor. England doesn't have them; they're too undignified and unbritish. Germany doesn't have them; they're too undisciplined. France doesn't have volcanoes; they won't fill out the necessary paperwork. Switzerland doesn't have them; they're too untidy and might frighten the cows.

Ah, but countries that have volcanoes! Mexico! Costa Rica! Indonesia! Japan! Italy! Chile! Greece! Columbia! Zaire! Iceland! Ecuador! and a host of other *National Geographic* special-type countries with cultures as flamboyant as their geology. Needless to say, neither Australia nor Canada has active volcanoes.

Every national capital should have a volcano just outside the city limits. It would do wonders to fix the minds of politicians on just what is important. If there was an active volcano just inside the beltway in Washington, DC, things would be ever so better. London could use a nice 3000 meter strato volcano as a backdrop for Big Ben and London Bridge. A volcano growing outside of Moscow would provide the Thunderbear concept of "Additional Bad News" (the force of which will solve the original problem!).

Why are people fascinated by volcanoes? First of all, they are God's supreme attention-getting device; being one of the few natural phenomenon that hits all five senses (You in the back row! Listen up there!).

Also, ordinary mountain peaks, even Everest and McKinley, are really just high points in a ridge that might extend hundreds or thousands of miles. Volcanoes, on the other hand, are solitary, independent, individual; each possesses its own personality. The poet Joaquin Miller's description of California's Mount Shasta would fit most of the big volcanoes—"White as the May moon, Lonely as God."

Finally, volcanoes are the only things left on dry land that are truly wild and free. No one "develops," "enhances" or subdivides an active volcano. True, mankind attempts various enterprises on their slopes, ranging from vineyards to geothermal projects, but when the local equivalent of Madame Pele decides to shrug her shoulders, we humans have only one elemental option available: run for our lives! The volcanoes' supremely impregnable existence both fascinates and terrifies us.

Naturally, we volcano groupies have our own fan magazine. *The Bulletin of the Global Volcanism Network* is put out monthly by the American Geophysical Union, 2000 Florida Avenue NW, Washington, DC 20009 and is $20 dollars well-spent for a year's subscription. I could not be without it!

by PJ Ryan

The February table of contents positively reeks of danger, adventure, and far away places:

- Barren Island (Andaman Islands) New eruptions; lava flows reach the ocean.
- Merapi (Indonesia) Seismic data on November 1994 Dome collapse.
- Aoba (Republic of Vanuatu) Increased steam and seismicity; evacuation preparations.
- Yake-Dake (Japan) Hydrothermal explosion kills four people.
- Kilauea (Hawaii) Lava flows on coastal plain; four active ocean entry points.
- Popocatepetl (Mexico) Small ash cone observed in summit crater; plume rises 3 km.
- Hudson (Chile) Sulphurous odors, noises, rising rivers, and thermal anomalies. (Almost apocalyptic writing for a scientific journal, buckaroos!)

And many others. An average of roughly 159 volcanoes are active at any given time.

Naturally, all this activity has caught the attention of bureaucrats. The United Nations has decided on a decade of intensive study of the world's most potentially deadly volcanoes.

The top 15, the Decade Volcanoes, are, in no particular order of malignancy: Mauna Loa (US), Mount Rainier (US), Colima (Mexico), Etna (Italy), Galeras (Columbia), Merapi (Indonesia), Nyiragongo (Zaire), Sakurajima (Japan), Santa Maria (Guatemala), Santorini (Greece), Taal (Philippines), Teide (Spain), Ulawun (Papua New Guinea), Unzen (Japan), Vesuvius (Italy).

You will notice that the National Park Service is proprietor of two of the Decade Volcanoes. The US Forest Service's spectacular Mount St. Helens did not make the cut.

Of the 15 Decade Volcanoes, only Mauna Loa and Etna are wealthy enough to be able to afford the rivers of molten lava that Hollywood volcanoes traditionally throw at the hero and heroine. Mauna Loa menaces the city of Hilo on the Big Island, but the danger is mainly property loss as even the slowest citizen should be able to outrun a lava flow. Most volcanoes kill people and destroy property by means of *lahars* and/or the less common *nuee ardente*.

Lahars are vast, fast moving rivers of liquid mud that roar down a snow volcano's flanks when volcanic activity suddenly melts glaciers and snowfields near the summit. It was a lahar from Columbia's Nevada de Ruiz that killed more than 22,000 people a few years ago. Lahars from Mount Rainier could engulf Tacoma and even Bill Briggle.*

Nuee ardente is a French term meaning roughly "glowing cloud." (We pushy Anglophones prefer calling the phenomenon a "pyroclastic gas flow," in Scientese.) Being a bystander at a nuee ardente is no fun, buckaroos, but you will have no time to form an opinion. Unlike a lahar, which will give you time to say your prayers, the nuee ardente's "glowing cloud" of superheated gases will be coming at you at speeds approaching 200 mph. You will hear the bang, have enough time to look up and say "Oh, merde! a *nuee ardente*!" and that's about it for this lifetime. It was a nuee ardente from Martinique's Mount Pelee volcano that took out the town of St. Pierre and its 23,000 citizens in 1902. There was one survivor.

Washington's versatile Mount St. Helens provided a nuee ardente as well as several lahars. Like Nevada de Ruiz it has sort of done its thing for the immediate future, and, though still active, is not considered a major threat.

Is there a possibility of volcanoes in Washington DC or Manhattan, thus giving the natives something to talk about other than themselves? Sorry, not anytime soon. Wrong locations on the tectonic plates. You say you saw castles in Spain, but don't recall any volcanoes: Just where is this Teide volcano located? Teide volcano is Spain's highest mountain (12,172') as well as being one dangerous hombre. The reason you didn't notice it is that it resides on the island of Tenerife in the Canary islands off the northwest coast of Africa.

Volcano watching is a fascinating hobby, buckaroos, and unlike bird watching, you can always find them.

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 May 1995 issue (#177).*

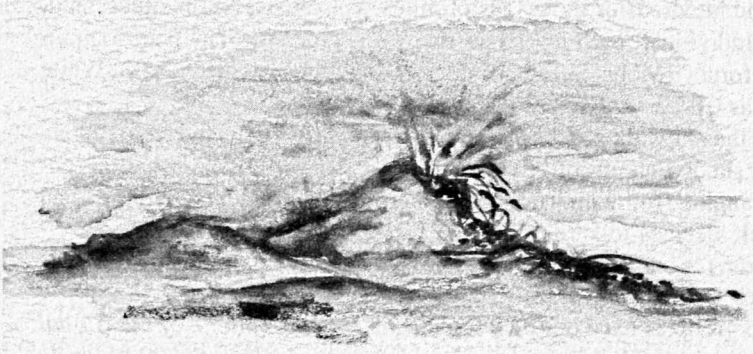


illustration by Becca Cunningham

*Briggle is the superintendent of Mount Rainier National Park and one of the more controversial (and feared) administrators in the NPS.

The Gila River-Sky Island Region: A Call For Bold Conservation Action

by Tony Povilitis

In Arizona, human numbers are growing at the same ecologically destructive rate as in Africa (2.7%). New Mexico's growth rate (2.2%) exceeds that of Brazil and India (1.9%). In seven years, Arizona will likely add nearly the population equivalent of two new Tucsons, and New Mexico four to five times the current population of Santa Fe! This explosive growth, metastasizing from urban areas to the countryside, is now fragmenting one of the ecologically richest regions of the US.

BIODIVERSITY EXTRAORDINAIRE

It is hard to imagine a better cradle for biodiversity. Located at the convergence of four major biogeographic provinces (Fig. 1), the Gila River-Sky Island Region (GRSIR) of southeastern Arizona and southwestern New Mexico features:

- A broad band of disjunct mountain ranges (sky islands) and desert valleys favorable to genetic isolation and evolutionary change.
- North-south orientation of highlands that could aid a latitudinal shifting of species in time of climate change.
- "Vertical stacking" of diverse biotic communities, from desert scrub to spruce-fir forest, resulting from an impresssive elevational range (4000–11,000 feet).
- A large contiguous mountain system (San Francisco Mts-Mogollon Mts-Black Range) providing a "regional center" for wildlife of temperate and northern coniferous forests.
- The largest number of species west of the Great Plains for major taxonomic groups such as vertebrates (Fig. 2) and butterflies (Pearson and Cassola 1992).

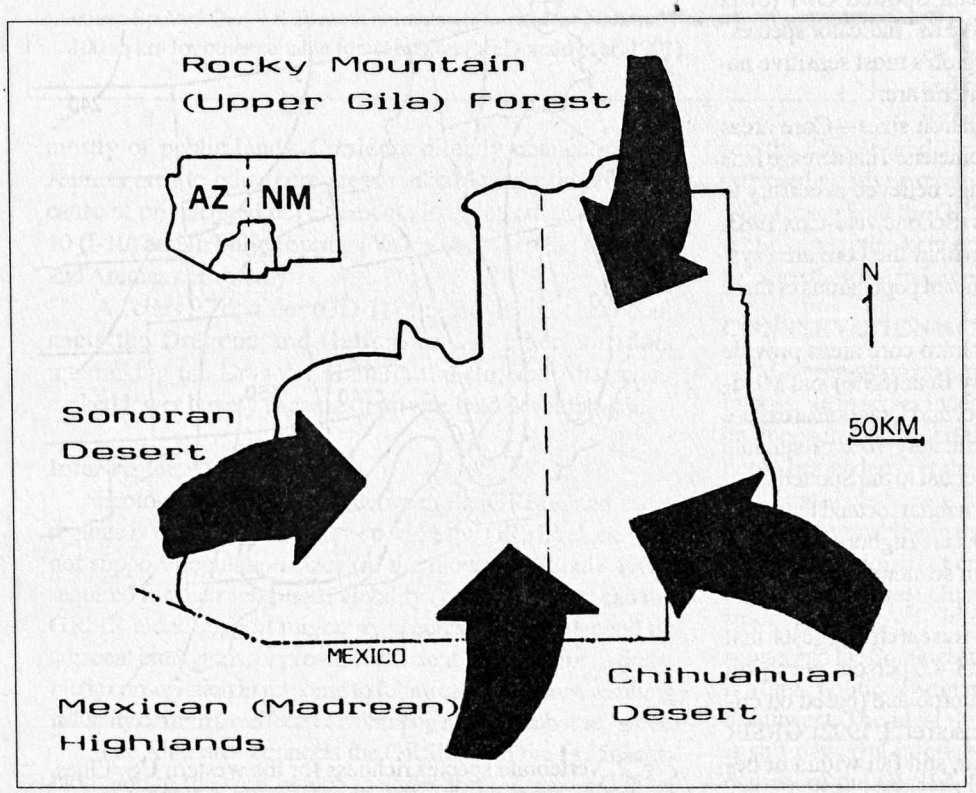


Fig. 1. Convergence of biogeographic provinces, Gila River-Sky Island Area (based on Udvardy 1975, Bailey 1980, Brown and Lowe 1980).

BIOLOGICAL CORES AND LINKAGES

Core Areas

Seven biological core areas are evident for the Gila River Sky Island Region (Fig. 3). These areas consist of 84% public lands (federal and state). They avoid overlap with major population centers and largely exclude primary agricultural and residential areas (Fig. 4). Nearly 9% of their total acreage is congressionally designed Wilderness.

The core areas include the major biotic communities and ecotones occurring in the GRSIR (Povilitis 1994). The Mogollon core area contains 5 biotic communities and 9 related ecotones not substantially represented elsewhere in the core area system. Playas and associated ecotones occur in the Peloncillo core area. For community and ecotone richness, the Galiuro area stands out as the most ecologically diverse of core areas.

The core areas include nearly all of the 156 GRSIR species considered to be at risk of extinction. (Exceptions are a few localized species such as Parish's Alkali Grass, *Puccinellia parishi*, in Grant Co., NM.) The Animas and Mogollon core areas contain the largest number of imperiled species (46 and 39, respectively). However, the smaller Altar (1 species/124 sq km) and Canelo (1 species/158 sq km) core areas have 2-4 times the *density* of imperiled species as these areas.

Grizzly Bear (*Ursus arctos*), Mexican Wolf (*Canis lupus baleyii*), Jaguar (*Panthera onca*), Desert Bighorn (*Ovis canadensis mexicana*), and Mexican Spotted Owl (*Strix occidentalis lucida*) (Table 1) can serve as "indicator species" to test core area suitability for the region's most sensitive native wildlife. Important suitability criteria are:

• Habitat availability and population sizes—Core areas total approximately 57,800 square kilometers. This acreage falls within the 10,000-100,000 sq km range believed necessary to support large wide-ranging mammals (Schonewald-Cox 1983, Newmark 1987). Available habitat within the core area system appears adequate to support significant populations of these indicator species (Table 1).

The Mogollon, Animas, and Galiuro core areas provide the bulk of suitable habitat for Grizzly Bear (85%) and Mexican Wolf (80%). The Animas, Galiuro, and Dragoon areas are critical for Jaguar, providing approximately 70% of suitable core habitat. The Mogollon area is essential to the Spotted Owl, with 85-90% of GRSIR Spotted Owl habitat located there. All core areas would help support the Desert Bighorn whose viability depends on herd persistence in scattered areas of broken-terrain habitat.

• Human population density—Research suggests that population densities of greater than 2.3-4.6 persons per sq km make large carnivore conservation improbable (based on criteria for the wolf, Henshaw 1979, Johnson et al. 1992). GRSIR core areas, with the exception of Altar, still fall within or below this range.

• Road density—Road density should not exceed .58-.62 km/sq km (Mech et al. 1988, for wolf; Povilitis 1993, for Grizzly Bear). High road densities signficantly increase the rate of human-induced mortality and behavioral displacement of sensitive species. All GRSIR core areas fall below this threshold.

• Livestock—Estimated livestock densities in GRSIR core areas range from 2.8-5.6 cattle/sq km and .02-.80 sheep/sq km. Livestock densities are generally lower than for the Yellowstone wolf reintroduction area (5.5 cattle/sq km and 4.1 sheep/sq km, peak values) (US Fish and Wildlife Service 1994).

Corridors

Twenty-three areas have been identified as primary biological corridors for the GRSIR (Povilitis 1994). These areas were ranked by combined numerical values for:

Natural cover (i.e., land not converted for agriculture or other uses), where 3 = >90%; 2 = 50-90%; 1 = <50%.

Land development, where 3 = little or no housing development; 2 = scattered development; 1 = moderate development.

Interstate highway, where 1 = highway absent; 0 = highway present.

Private land ownership, where 3 = <10%; 2 = 10-50%; 1 = >50%.

The Galiuro, Mogollon, and Animas areas are connected through the Peloncillo area by three "class 9 or 10" (highest ranked) corridors (PG-1, MP-2, PA-1) (Fig. 3), consisting

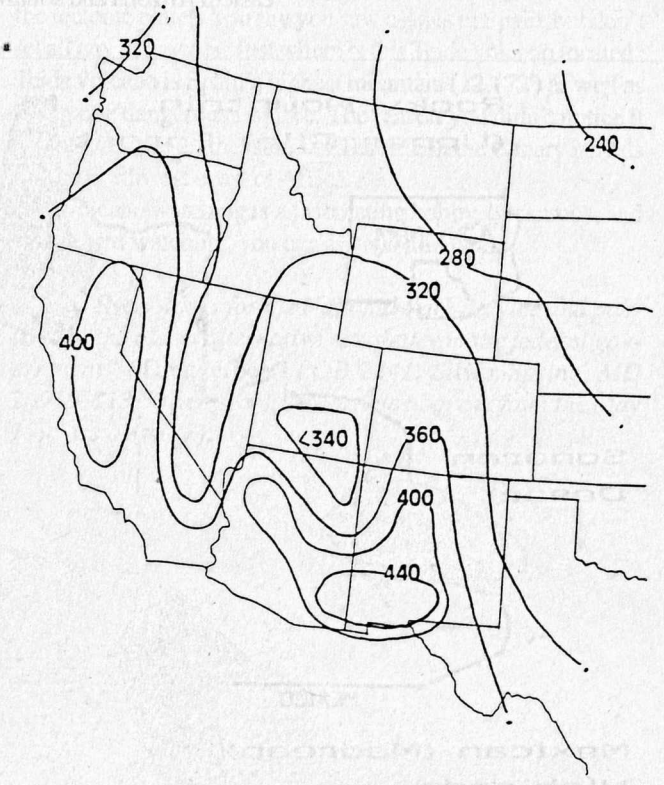


Fig. 2. Vertebrate species richness for the western US. Lines connect approximate centers of squares with a similar number of species (based on Hall 1981, Stebbins 1985, Peterson 1990, Burr and Page 1991).

Table 1. Estimated suitable habitat (sq km) and potential population size for selected conservation indicator species for the Gila River-Sky Island Region[1].

Species	Suitable Habitat	Population Size
Jaguar	38,000	429
Grizzly Bear	42,200	587
Mexican Wolf	42,200	118-274
Desert Bighorn	12,200	610-5002
Mexican Spotted Owl	4100-5800	313-446 adult pairs

[1] Potential population sizes were derived by applying animal density estimates to estimated suitable habitat in the GRSIR:

Jaguar—1.4 animals/100 sq km for madrean evergreen woodland and semi-desert grassland (probable primary Jaguar habitat, Brown 1983) and 0.5 animals/100 sq km for other habitats. Since density data are unavailable for Jaguar in the Southwest, population density figures for Mountain Lion (*Felis concolor*) were substituted (Donaldson 1975, McBride 1976). The Mogollon area was excluded because of the absence of madrean evergreen woodland and semi-desert grassland.

Grizzly Bear—1.39 animals/100 sq km (Povilitis 1993) for all habitat except desert basins and flats.

Mexican Wolf—0.28 animals/100 sq km (Bednarz 1988) to 0.65/100 sq km (US Fish and Wildlife Service 1987) for all habitat except desert basins and flats.

Desert Bighorn Sheep—5.0 animals/100 sq km (San Andres Mts., NM, A. Fisher, NM Game & Fish Dept., pers. comm.) to 41.0 animals/100 sq km (Cabeza Prieta NWR, Ariz., R. Schumacher, Refuge Manager, pers. comm.) for broken terrain habitats.

Mexican Spotted Owl—8.28 adult animals/100 sq km for National Forest land and 6.4/100 sq km for other suitable forest habitat (McDonald et al. 1991).

mostly of public lands. Corridors directly connecting the Animas area to other core areas ranked lower primarily because of private land development along Interstate Highway 10 (I-10) and in Sulfur Springs Valley (between the Dragoon and Animas core areas).

A "class 9" corridor (GD-1) of mostly public land connects the Dragoon and Galiuro areas. Other corridors interlinking the Dragoon, Galiuro, Canelo, and Altar areas ranked lower largely because of private land development.

Inter-regional Linkage

Ecological connectivity between the GRSIR and other regions is essential. For many species, the GRSIR alone cannot support population sizes (in the thousands, Soulé 1987) required for their long-term viability (centuries). Nor can the GRSIR alone support migratory species that also depend on adjacent bioregions, or provide sufficient land area for regional biotic conservation in response to future climate change resulting naturally or from the effects of anthropogenic "greenhouse" gases.

The Altar area connects the GRSIR with the El Pinacate bioregion to the west, which includes the Tohono O'Odham tribal lands, Organ Pipe National Monument, Cabeza Prieta National Wildlife Refuge, and two Mexican Biosphere Reserves (Williams 1994). The Dragoon and Canelo areas link the Galiuro area directly with northern Mexico. The Animas area links the GRSIR with Mexico's northern Chihuahuan desert and the proposed Casas Grandes reserve (B. Miller, Univ. Autonoma de Mexico, pers. comm.). The Peloncillo Mountains, which extend nearly 200 km north to south, provide a highland bridge to Mexico's Sierra Madre. Finally, the Mogollon and Galiuro areas connect the GRSIR northward with the Colorado Plateau region and central New Mexico and Arizona.

PRIMARY THREAT TO THE BIOREGION

If current development trends continue, the Gila River Sky Island Region will be fragmented to the point where bioregional conservation will be a dream of the past. Because of development spreading east and south of Tucson along I-10 and I-19, all major biological corridors connecting the Canelo area with the Galiuro and Altar areas are being closed. Agricultural and housing development in the Sulfur Springs Valley threatens to sever ecological connectivity between the Animas area and other core areas to the west. Connectivity across the lower San Pedro Valley (linking the Canelo and Dragoon areas) is jeopardized by the proposed massive expansion of Fort Huachuca (US Army 1992).

Throughout the GRSIR, the story is much the same. Major linkage zones between biological core areas are imperiled because they are in large degree "developable" lands.

CONSERVATION ACTION

Conservation on a grand scale for the GRSIR may seem impossible to some. Indeed, human commitment, involvement, and cooperation on an unprecedented regional level will no doubt be needed. Yet there is a real basis for hope.

First, a plethora of home-bred organizations and activists are already working in the GRSIR, and could together address the land development crisis. These include the Border Ecology Project, Forest Guardians, Gila Watch, the Greater Gila Biodiversity Project, the Sky Island Alliance, the Sonoran Institute, and the Southwest Center for Biodiversity. Second, there is a large politically untapped public constituency for the rural Southwest. The ideal of a healthy, wholesome rural America is still powerful in our society. Third, the human population density of the GRSIR, for now, remains comparatively low (approx. 5 people per sq km), and most of the region (74%) is publically owned.

To save the GRSIR, a regional coalition of environmental groups, community leaders, landowners, businesses, local governments, and concerned citizens is needed. A broad range of land-based traditions, lifestyles, and interests at stake should help unite citizens. Broad-based efforts at bioregional organizing for conservation and sustainability are already under way for other areas of the US such as Yellowstone (Greater Yellowstone Coalition 1994), the Southern Appalachian Mountains (Council on Environmental Quality 1990), and the San Juan Mountains (Greater San Juan Partnership 1995).

At this critical time, a major coalition for conservation and rural sustainability is our best (and perhaps only) hope for an ecologically intact GRSIR. In the short run, such a coalition must at least slow down the pace of "rural sprawl." Its primary aim should be to aggressively promote land conservation agreements and policies that can protect key ecological areas, and ultimately bring the region's explosive land development and population growth under control. WERF

Acknowledgements

I applaud my students who helped compile data for this paper and assisted in related field observations. Their participation was made possible through the Sierra Institute, University of California, Santa Cruz, and Prescott College in Prescott, Arizona. I also thank the Arizona Game and Fish Department and the New Mexico Natural Heritage Program for their kind assistance in providing information on listed species.

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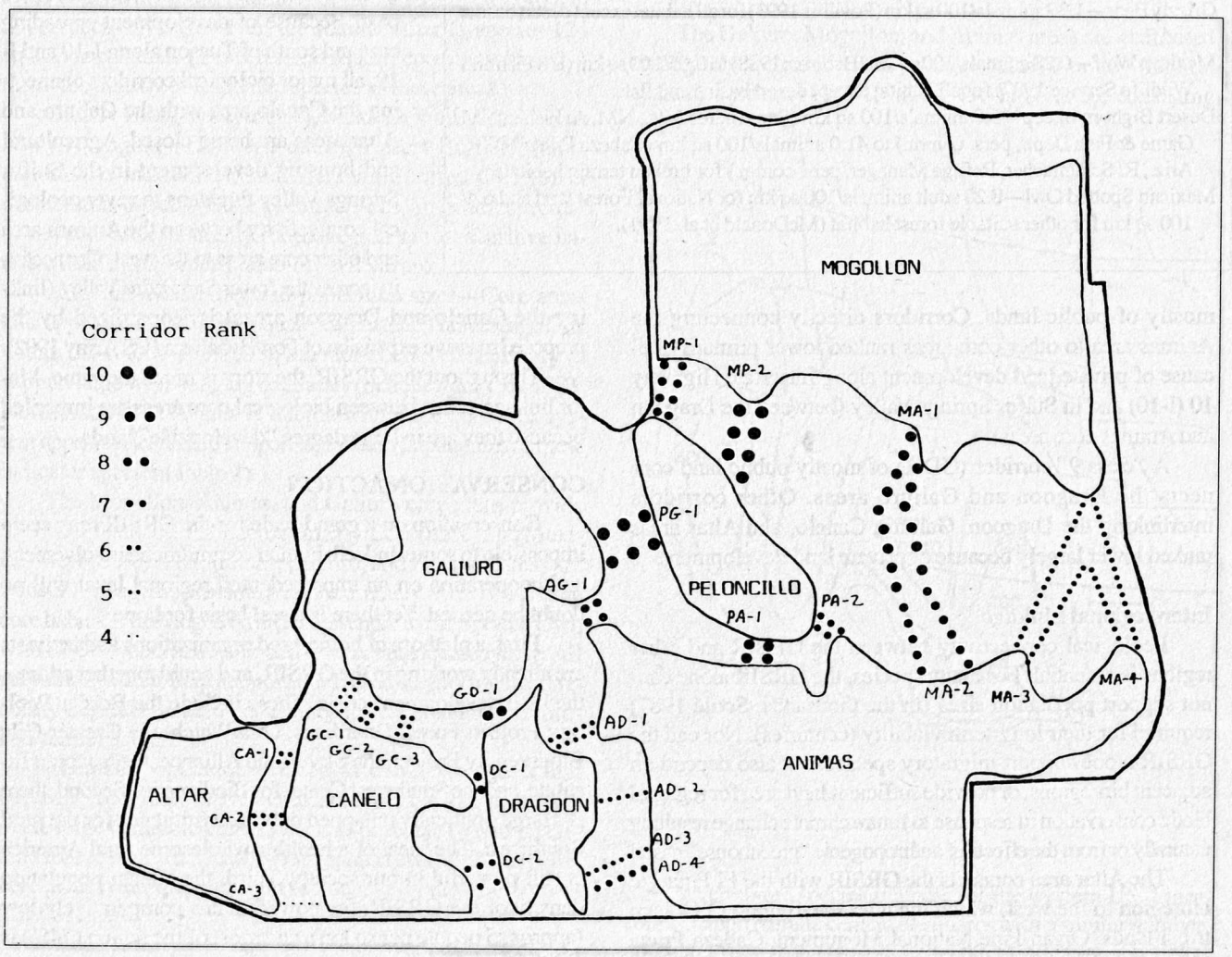

Fig. 3. Biological core areas and corridors for the Gila River-Sky Island Region.

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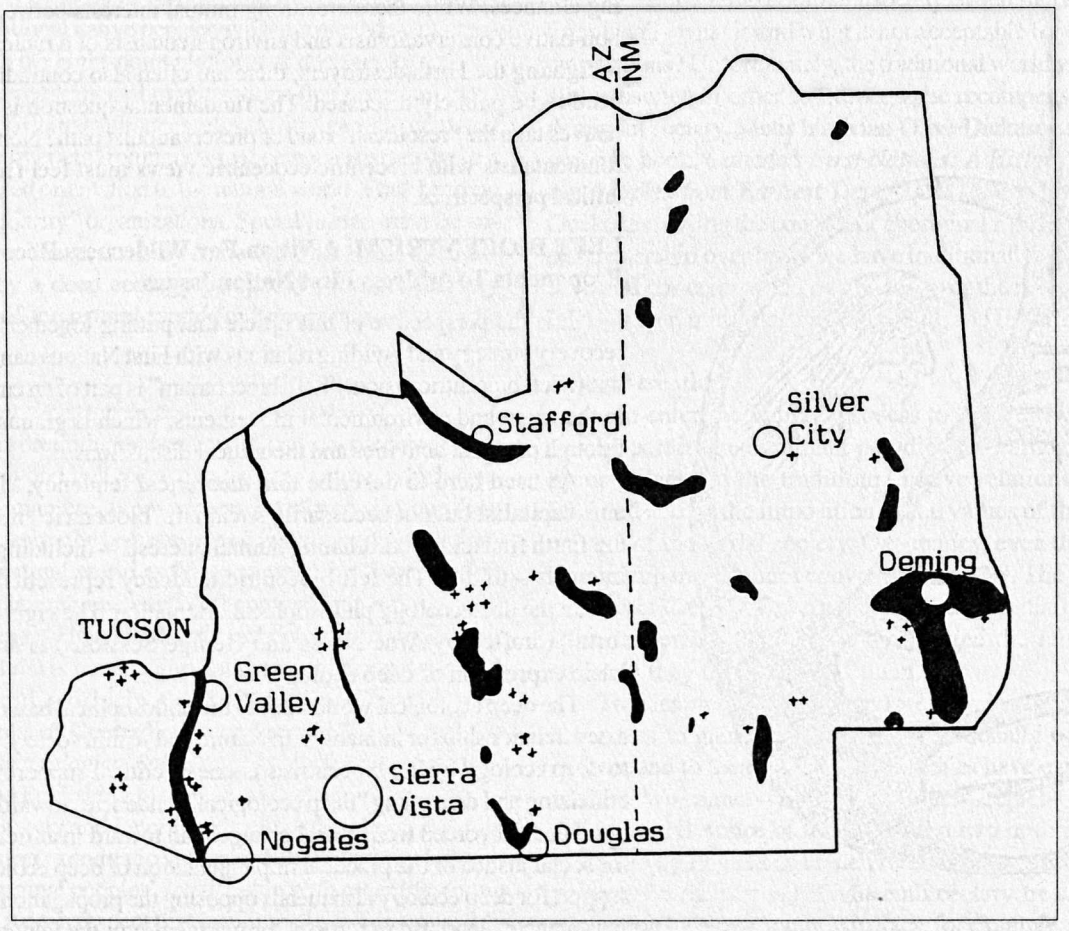

Fig. 4. Primary agricultural areas (black), population centers (circles), and rural land development areas (crosses) in the Gila River-Sky Island Region (Hecht and Reeves 1981, Williams 1986, Bureau of Census 1990).

The Wild Path Forward

Left Biocentrism, First Nations, Park Issues and Forestry A Canadian View

by David Orton
illustrations by Paul Hollingsworth

North American Wilderness Recovery Strategy proponents must address First Nation issues, because such issues, at least in Canada, will affect the success of any emerging Strategy. It has become necessary to have views on aboriginal issues—including aboriginal rights and treaty rights, native sovereignty, and land ownership—and be prepared to express and defend them. A wilderness recovery strategy entails building alliances. While there are strong mutual interests between native and non-native conservationists and environmentalists of a radical persuasion in fighting the Earth destroyers, there are often also contradictions which need to be publicly discussed. The fundamental question is usually, will natives take the "resourcist" road or preservationist path? Non-native environmentalists with biocentric/ecocentric views must feel free to express critical perspectives.

LEFT BIOCENTRISM: A Vision For Wilderness Recovery Proponents To Address First Nation Issues

It is the perspective of this article that putting together a wilderness recovery strategy and building relations with First Nations can best be done with a left biocentric vision. "Left biocentrism" is part of an emerging trend in the green and environmental movements, which is gradually evolving through practical activities and theoretical discussions.

As used here to describe this theoretical tendency, "left" means anti-capitalist but not necessarily socialist; "biocentric" means putting the Earth first and subordinating human interests—including indigenous interests—to this. The left biocentric tendency represents a left focus within the deep ecology philosophical orientation. The eight-point "Platform" (drafted by Arne Naess and George Sessions) is accepted as a basic expression of deep ecology.

The deep ecological world view is the philosophical basis for building a new relationship for humans with Nature and within society. The attitude to deep ecology by left biocentrists is one of critical support. This means criticizing and discarding "deep ecological" tendencies toward the cultivation of self divorced from social change, and toward insufficient concern for social justice or the practical implementation of deep ecology. Critical support for deep ecology also means opposing the propagation of myths of "sustainable" land use in forestry, or marine use in the fishery, within an industrial capitalist society based on private property, endless economic growth, population growth, and consumerism.

Left biocentrists agree that industrial capitalism must go—both industrialism and capitalism. The nature of its replacement is the subject of continuing discussions. Various names and conceptualizations have been formulated to try to encapsulate this emerging left biocentric tendency. Its final terminology and content are yet to be decided. In applying the left biocentric perspective to the topic of "Environmental—First Nations Relations," there will obviously be genuine differences of opinion.

RELATIONSHIP TO TRADITIONAL NATIVE THOUGHT

The relationship of the left biocentric tendency to traditional native thinking is also in the process of being defined. Traditional native world views seem to have stressed several themes at odds with industrial capitalism: the unity and interrelatedness of life; the belief that the world unfolds in a cyclic, not unilinear, way; a communal system of property, as against private ownership; detailed knowledge of Nature; living in place (bioregionalism); population self-regulation; respect for all life forms and their sacredness; a sustainable "harvest" of wildlife over thousands of years; and rituals that severely limit the destruction by humans of flora and fauna and the land itself. This traditional native perspective has a great deal of compatibility with the eight-point platform of deep ecology.

Some environmental organizations that promote environmental/aboriginal alliances elevate indigenous-centered social justice over environmental justice because they have a human-centered orientation to the natural world. They become in effect "solidarity" organizations. Social justice must be addressed by our deeds, not only our words, but it has to be accompanied by a deep ecology perspective. Otherwise, any exploitation of the natural world for human purposes can be justified.

Beyond human-centeredness

My own preliminary position is that deep ecology is a movement beyond indigenous attitudes to nature, which center around human use, however respectfully carried out. One might characterize the best native positions regarding relationships to the natural world as "deep stewardship"—a position that remains human-centered. Although adequate for gathering and hunting societies with little technology and small numbers of people, it is not encompassing enough for the survival of the natural world in the 1990s. (See David Orton "Envirosocialism: Contradiction or Promise?" in *Green On Red: Evolving Ecological Socialism*, Society for Socialist Studies/Fernwood Publishing.)

David Suzuki and Peter Knudtson, in their book *Wisdom of the Elders*, an examination of a number of aboriginal views, write: "Aboriginal peoples' relationship with other life-forms comes from a deep respect that is ultimately self-interested."

This native human-centered world view believes that animal and plant life is on Earth for human use, as shown in some of the anthropological evidence introduced in support of the native food fishery in the well-known Canadian Supreme Court Sparrow case. The Sparrow court case has become the justification for the now official federal government Aboriginal Fisheries Strategy. (See text of the 1990 Decision, Supreme Court of Canada *Ronald Edward Sparrow versus Her Majesty The Queen.*)

The salmon was not only an important source of food but played an important part in the system of beliefs of the Salish people, and in their ceremonies. The salmon were held to be a race of beings that had, in "myth times," established a bond with human beings requiring the salmon to come each year to give their bodies to the humans who, in turn, treated them with respect shown by performance of the proper ritual. Towards the salmon, as toward other creatures, there was an attitude of caution and respect which resulted in effective conservation of the various species.

This self-limiting though human-centered "respect" is undermined and ultimately destroyed by capitalist industrialism, which turns all of nature into commodities for sale in the market place.

The dilemma for traditional native thinking is how does one "settle" with the dominant society, when this society defines legally what is and what is not acceptable for debate and negotiations? Unfortunately, the traditional world view is usually jettisoned in order to extract some recompense from the dominant society. Metis historian Olive Dickason in her progressive book, *Canada's First Nations: A History of Founding Peoples from Earliest Times,* quotes Cree lawyer Delia Opekokes, saying the concept of aboriginal rights "recognizes our ownership over lands we have traditionally occupied and used and our control and ownership over the resources of the land—water, minerals, timber, wildlife and fisheries."

Beyond treaties

To enter the judicial process to "settle" land claims, to take part in the dominant paradigm of values, is to give up or go against the traditional native relationship to the land and accept the imposition of the values of the colonizers and of industrial society. Occupancy, even the first human occupancy, cannot convey title to land. The aboriginal peoples of Canada—who were themselves initially migrants from somewhere else, Asia—*occupied* the lands in this country; they did not "own" them.

Treaties were originally, and are now, instruments for the colonizers to gain access to lands traditionally occupied by natives, and to the lands' wealth. Treaties have expedited the process. We cannot—nor should native peoples—accept the validity or relevance of treaties signed two or three hundred years ago by English or French feudal kings or queens or appointees on their behalf. Eighteenth century treaties now in contention by Nova Scotia Micmacs, for example, such as the Treaty of 1752, were "signed" on the aboriginal side by people unable to write or read the treaty language. Moreover, all the

treaty language "agreed" to by the colonialists and the indigenous peoples presupposed a totally human-centered view of the natural world.

Beyond land ownership and property rights

Language embodies a world view that is often taken for granted, and frames a debate. Thus the wording of the expression "land claim" assumes in some way its justice. "Property rights" are the way a society organizes its affairs; they reflect the distribution of power and influence—the class structure—within a society. Insofar as they have been applied to nature, such rights have presumed that one species—humans—has the right to decide whether or not other animal species, plant species, and the physical environment itself have the "right" to live or die. Clearly, this is not an acceptable view for a deeper environmentalism. Humans cannot "own" the Earth. We make use of it, wisely or foolishly.

Property rights vary from state through communal to individual ownership. Such rights are socially created and can therefore be socially redefined and changed. Social justice and justice for nature within a society should be the criteria for evaluating so-called property rights. Court systems in all modern societies, including Canada, buttress property rights and defend the existing class structure, over human rights and the rights of nature.

The choice becomes, then, whether to accept the property rights values within which present debates are conducted (as with "Buy Back The Adirondacks") or to put forth an alternative vision of "rights," and socially mobilize for their implementation. The latter is the promise of a radical deep ecology. There can be no true resolution of past and present injustices against native peoples, and no sustainable land use practices or sustainable native or non-native communities, within a continuing industrial capitalist society.

illustration by Paul Hollingsworth

LAND CLAIMS

"Land claims" and "treaty rights" present conflicts when developing a wilderness strategy for Canada. Two very helpful recent (1993) discussion papers that raise these issues, and identify specific national and provincial parks subject to native land claims, are: *Putting Nature First: Conservation Principles to Guide the Settlement of Aboriginal Land Claims* by the Federation Of Ontario Naturalists, and *Protected Areas and Aboriginal Interests in Canada* by James Morrison for World Wildlife Fund Canada.

The federal government in 1973 established a process to supposedly settle land claims outside of the "win or lose" court system, making the distinction between "comprehensive" and "specific" claims. Comprehensive claims concern lands never covered by treaties, "where the claimant seeks a negotiated settlement on the basis of unextinguished Aboriginal title arising from traditional use and occupancy of the land."

Comprehensive land claims cover very large land areas; for example, the first was the 1975 James Bay and Northern Quebec Agreement. First Nations have directed comprehensive land claims at Parks Canada concerning the Mingan Archipelago (Quebec), the Torngat and Mealey Mountains (Labrador), and Gwaii Haanas/South Moresby (BC). For much of the territory of northern Canada and much of British Columbia, comprehensive claims have now been settled or are in negotiation. Recently settled comprehensive land claims include Nunavut (eastern Arctic), Inuvialuit (western Arctic), and the Gwich'in lands (Yukon). Hundreds of millions of dollars have been paid out or committed for comprehensive claim settlements.

Specific claims deal with unfulfilled treaty promises or government maladministration, "where the claimant seeks a negotiated settlement arising from unfulfilled government obligations under treaties, agreements or statutes, or the improper administration of Indian lands and other assets under the Indian Act."

First Nations have directed specific land claims at Parks Canada concerning the following parks: Banff (Alberta), Riding Mountain (Manitoba), Pukaskawa (Ontario), Bruce Peninsula (Ontario), and Point Pelee (Ontario). In addition to these federal parks, a number of provincial parks, including Algonquin and Quetico in Ontario, are subject to native land claims and thus to fundamental change. To take positions on the hundreds of outstanding specific land claims in Canada, biocentric non-native environmentalists need to look at First Nations' fundamental values and assumptions—asking, for instance, "can treaty rights and land claims be supported?"—and also at their own values and assumptions.

Why aboriginals generally oppose "allocations for nature"

Native land claims are often about the "harvest" of wildlife and "economic" opportunities. There seems to be little regard for sanctuaries—or what the Land Claims Work Group of the Federation Of Ontario Naturalists called "allocations for nature."

Working against allocations for nature are the following factors:

a. Aboriginal Canadians historically utilized and changed their natural surroundings.

b. Traditional native territories often include existing provincial and federal parks and other protected areas, or some portion of them.

c. Natives were often physically dislocated when parks or other protected areas were established.

d. The primacy of treaty rights and land claims is asserted in the Canadian Constitution.

e. Much crown, i.e., public, land covered in forests has been handed over to the forest industry, on long-term renewable leases.

f. At least in southern Canada, most land "unoccupied" by humans is in some kind of park status.

For all of these reasons, in many parks indigenous rights to hunt, fish, and trap as part of land claims are being pursued, and wilderness or wildlife sanctuaries closed to human "use" are being opposed. Governments at the federal and provincial levels seem increasingly willing to compromise the ecological integrity of the poorly defended parks system in Canada for native land claims. This is politically easier than changing the well-defended "allocations" of non-park crown land, which have been committed to the timber industry on a long-term basis. Generally, aboriginal peoples in Canada are asserting their "rights" to hunt, trap, and fish year-round, as in "traditional" times, but using modern technologies of destruction and transportation, and in a country now with a population of around 30 million people.

However, the situation in the 1990s, because of human numbers and the habitat destruction caused by industrial society, demands large wilderness areas without any industrial exploitation such as clearcut logging, mining, and hydro projects, and without human "harvesting" of animal and plant life. Species have to be given the opportunity to continue evolving. The general vision outlined in "The Wildlands Project: Plotting A North American Wilderness Recovery Strategy" needs to be implemented on the ground. It is a necessary condition for ensuring the survival of all species on Earth, including *Homo sapiens*. This is the ecological context for addressing social justice for aboriginal Canadians.

Ecological integrity given up

In Canada's National Parks and reserves for National Parks north of the 60th parallel, aboriginals have the legislated right to "harvest" wildlife by hunting, trapping, and fishing. In the south, only Pukaskwa National Park in Ontario presently allows this. However, ministerial discretion in the National Parks Act allows the federal government to authorize in any wilderness area "the carrying on of traditional renewable resource harvesting activities." Land claim settlements in northern Canada have accepted that aboriginal people can kill wildlife in protected areas.

A posting in the electronic network in September of 1994 announced that the Canadian government is seeking an amendment to the Migratory Birds Convention (MBC):

The MBC establishes a closed season between March 10 and September 1 each year. The intent of the closed season is to protect migratory birds from over-harvest by sport and commercial hunters, but the closed season also made certain traditional harvesting of migratory birds by Aboriginal people illegal.

The primary amendment proposed by the Canadian government would provide for Aboriginal people in Canada to harvest, throughout the year, migratory birds for food, social and ceremonial purposes, subject to conservation and allowing for the existing Aboriginal and treaty rights protected in the Constitution of Canada.

The maintenance of ecological integrity, which is supposed to be the first consideration in any national park management plan, has essentially been abandoned. The following is stated in the current (1994) *Guiding Principles and Operational Policies* of Parks Canada:

In parks where there are existing Aboriginal or treaty rights, the exercise of these rights will be respected. As well, in some national parks, traditional activities by Aboriginal peoples will continue as a result of rights defined by land claim agreements and treaties, or by specific agreements negotiated during the process of park establishment. Given the legislative and constitutional basis of such agreements, they are expected to supersede Parks Canada policy and in some instances will consequently amend the National Parks Act.

An acceptance of the validity of land claims and treaty rights—based on the premise that aboriginal peoples in some way "owned" the land now called Canada and therefore must be compensated today—justifies aboriginal peoples' many assertions. If the logic is followed through, "inherent" rights, i.e., rights by virtue of being an aboriginal people, mean that aboriginals do not need agreements with federal or provincial governments regarding hunting, fishing, trapping, taxes, education or the like. From such a perspective, making agreements with the federal or provincial government means not recognizing inherent rights! Notwithstanding grievous historical wrongs, however, an endorsement of such aboriginal views today is at the expense of nature as well as non-native Canadian society.

Fur trapping and parks

Access to furs was a major reason for the European entry into Canada. The resulting introduction of the "fur trade" totally changed the aboriginal lifestyle, away from self-sufficiency to one of dependency and subordination to the European colonizers for various trading goods. The fur trade undermined the self-restraint of the native deep stewardship relationship to wild animals. Fur bearing animals became "commodities" for a market. Also, many native people were killed in fighting over control of the fur trade between the British and French colonial powers. Given this history, it is bewildering that many native and non-native mainstream environmental spokespersons defend fur trapping as crucial to the indigenous way of life.

We should oppose commercial fur trapping, commercial hunting, and management of wildlife for commercial purposes. Personally, I do not oppose trapping or hunting or fishing by aboriginal Canadians, for personal or community use, as part of a traditional lifestyle—provided it is carried out in a context of the new awareness and knowledge being gained from conservation and restoration biology today.

Algonquin Park is one of Canada's many protected areas now exploited by trappers. This much-loved Ontario park was established in 1893. Used in various basically harmless ways by hundreds of thousands of Canadians, and stamped in the contemporary Canadian soul by landscape painters like Tom Thomson, it is the last ecosystem in southern Ontario where natural processes have a chance of functioning normally. (Wolves crossing the park boundaries in winter in pursuit of deer regularly get shot, showing the need for extensive buffer zones surrounding parks, with controlled human, wildlife-friendly land use.) The Algonquins of Golden Lake have made an extensive land claim—about 36,000 square kilometers, covering much of the Ottawa Valley, and taking over the administration and control of Algonquin Park. A spokesman for the tribe, Greg Sarazin, has written (see the 22-page document "220 Years of Broken Promises," no date):

In 1954 a new regime of fur management in Algonquin Park arrived. The government realized that proper harvesting of fur-bearing animals would strengthen the populations and ensure their survival—something the Indians always knew. The entire eastern half of the park was opened to the trappers from Golden Lake (and only to them) and, ever since, each trapline has been in full use and occupation.

The idea that trapping and hunting are needed to maintain the balance of nature is also repeated by non-native killers of wildlife in seeking to continue their practices. Native and non-native biocentrists need to step forward in unity and become vocal spokespersons for the wildlife of Algonquin, lest plant and animal "voices" become drowned out in the carving up of this park.

FORESTRY

In forestry, natives and their non-native environmentalist allies seem to face these choices:

- Natives can seek a place within the existing industrial forestry model, which destroys ecosystems and human communities, but which can disburse some economic benefits. Buffy Sainte-Marie has a line in her song "Disinformation" that seems appropriate here—"to make the same old mistakes in a brand new way."
- Aboriginals can define their own alternative forestry perspective.
- Aboriginals can unite with a deep ecology forestry alternative.

Non-native forestry activists must be clear about their own path, and about which path potential native allies have embarked upon.

The dominant native forestry trend

The dominant First Nation trend in forestry in Canada now is participation within the industrial forestry paradigm. An article outlining an Aboriginal Forest Strategy, presented by Harry Bombay, the President of the National Aboriginal Forestry Association (NAFA), in the 1994 spring/summer issue of the trade magazine *Canadian Silviculture*, makes this quite clear. He offers no critique of clearcutting or forestry biocide use, but endorses "sustainable development": continued economic growth in the forest industry.

NAFA made an August 1993 intervention to the Canadian Royal Commission on Aboriginal Peoples, called "Forest Lands And Resources For Aboriginal Peoples." In it, NAFA argued for an "aboriginal forest industry" and sought "co-management" of "natural resources" with the timber and pulp companies and governments. The flawed assumption in their intervention was that the forest industry as it exists today can accommodate and respect aboriginal values. Other Canadian examples of native participation within the dominant industrial forestry paradigm, supported by some non-native environmentalists and organizations, include participation in the federal government's Model Forest Program, participation in the "Interim Measures Agreement on Clayoquot Sound," and the Sustainable Development Agreement of the Algonquins of Barriere Lake in La Verendrye Park in Quebec.

Corporations are interested in access to forests, not necessarily in ownership of forested land. Therefore when public pressure builds in support of "settling" land claims, corporations in Canada will accept such settlements provided they are permitted continuing access to turn trees into industrial commodities, as at Clayoquot Sound.

The Aboriginal Forest Strategy is not official government policy. The Aboriginal Fisheries Strategy is federal government policy and is being implemented across Canada. Both strategies assume participation within the industrial capitalist model—the very model that is destroying the forests and the fisheries in Canada.

The deep ecology forestry alternatives

Deep ecologists offer two contrasting paths to follow. One is a reformist path which defines some kind of eco-forestry and its certification, within the existing industrial system. "Renegade" foresters are active on this path. Journals like the *International Journal of Ecoforestry* serve as a vehicle to express the reformist deep ecology, "eco-forestry within the system" position. The other path, less well developed, and in the left biocentric camp, states that a "sustainable forestry requires a sustainable society." It calls for, and is working toward, the dismantling of existing industrial society as part of a deep ecology forestry strategy.

CONCLUSION

From an ecocentric perspective, we need total land reform in Canada and throughout the world, so that the land, water, and air are seen as the common inheritance of all living beings. So-called private, native, or crown (state) property "rights" are ecologically meaningless. Non-native environmentalists seeking unity with aboriginal peoples to create a North American Wilderness Recovery Strategy need to make the distinction between a native rights agenda and a native land or land claims agenda. Native rights to full self-governed participation in Canadian society must be supported. But if one believes, as ecocentrists do, that the Earth "belongs" to no one, not even to aboriginal peoples, then often land claims and native views on non-human species must be opposed. WERF

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illustration by Paul Hollingsworth

Baby Questionnaire

Questions to Ask if you're Considering Having a Baby

What is your purpose for having a baby? (Check all items that apply.)

__ I like kids
__ Children will support me in my old age
__ It was an accident
__ To solidify our relationship
__ To perpetuate my values—the world need conscientious children
__ It's my right and my duty
__ My biological clock went off
__ I don't believe in abortion ("Right to Life")
__ I want a family
__ I want to fulfill my function as a woman/man
__ I want to experience reproduction
__ To perpetuate my lineage (name, genetic pool)
__ It's an affirmation of life's goodness
__ I need to nurture
__ I need to be nurtured
__ I don't believe in birth control
__ My friends are having babies
__ To test my theories of parenting
__ To avoid the basic issues of my life
__ My child needs a brother or sister
__ It's a tax deduction
__ There are monetary benefits (e.g., higher pay in armed services)
__ It's cheaper than adopting
__ It's an expression of who I am
__ I'd be socially out of step if I didn't have a baby
__ It's the thing to do; everybody does it
__ My parents want grandchildren
__ My spouse wants a baby
__ I want to be loved
__ I want to give love
__ Babies are cute
__ I want the companionship having a child would give
__ I want to contribute to evolution
__ I want to experience pregnancy (and the attention that comes with it)

List any other purpose(s)

Is having a baby the best way to fulfill these purposes? Are there other ways? Here are a few options. Can you think of others? List yours.

- Adoption
  - adopt a child from another country
  - adopt an abandoned child
  - adopt a newborn, or an older child
- Volunteer service
  - public service
  - pediatric wards
  - politics
  - work with abused kids
  - work with handicapped kids
- Being a caregiver (nurturer)
  - for children in general
  - for adults in general
  - for the planet
  - do babysitting
  - daycare center
  - Head Start program
  - Big Brother, Big Sister program
- Education and intellectual pursuits
- Aunthood (be an "aunt" or "uncle" to a child)
- Spirituality
- Creativity

How is your relationship with your mate?

- Does your mate want a baby?
- Will the baby enhance this relationship? Really?
- Is your relationship solid, stable, and joyous *now*?
- Do you have enough time to spend with each other now?
- What arrangements have you made with your mate for spending time together after your child is born?
- How do you intend to divide up the added physical and mental responsibilities?
- Do you think having a baby will bring you closer together? Think again.

How is your health, the health of your mate, and of your other kids?

- Are you aware of your family history, and what genetic tendencies or flaws might be passed on?
- How is the emotional/psychological/physical health of your family?
- Do you have any illness whose treatment might affect the baby?

Produced by the New Road Map Foundation and reprinted by permission. For a free, lengthier version of this questionnaire, send a SASE to the QTS, Dept. BQ, POB 15352, Seattle, WA 98115.

- Do you have habits that might endanger the baby in the womb or after?
- Do you have a plan for caring for the child if you are sick, short term or long term?
- Can your body handle the increased demands of child-rearing?

How is your financial health?

- Are you prepared to spend a quarter of a million dollars on this child during its lifetime?
- Do you have realistic expectations of costs of pregnancy and delivery, including complications?
- Do you have a 20-year financial plan for your child? Does it account for unforeseen illnesses and accidents?
- Do you have health insurance? Will it cover unexpected costs?
- Are you prepared for extra expenses such as braces, speech therapy, glasses, vitamins or special diets?
- Is money a cause of worry and concern in your life?
- Do you have the financial savvy to teach your children about finances?

Do you have realistic expectations about having and raising a child?

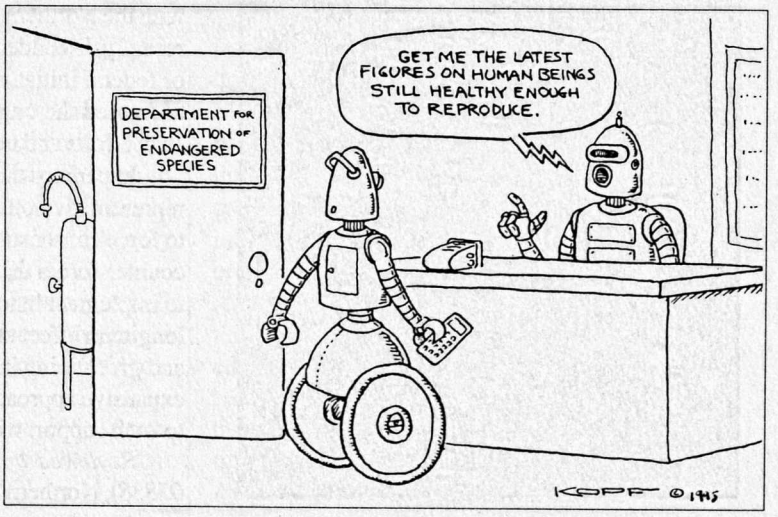
- Do you realize how much time you must devote to a child for 18 years?
- Has this been a joint decision by you and your mate?
- What if the baby should have a long-term illness or disability?
- What if it is a "difficult baby?"
- Are you ready for the distractions of child rearing?
- Are you involved in projects that you would have to give up if you had a child? Have you replaced yourself?
- Can you accept any physical damage or complications that might result from your pregnancy—such as varicose veins, hemorrhoids, death, etc.?
- Do you have other demands on your time and attention—e.g., creative work, community work, time needed to sustain relationships outside of family?
- Do you have knowledge about child rearing?
- Will you be able to really love this baby even if he/she doesn't meet your expectations?
- Will you feel guilty if you are not able to effectively deal with the child all the time?
- Are you prepared for emergencies?
- Are you prepared for the physical and emotional stress of short-term or long-term sickness in your child?
- If you were a child, would you like to be born to you? At this time?
- Do you know the statistics on suicide, cancer, drug/alcohol abuse, and addiction?

How is your support system?

- Do you have a support system for psychological, emotional, and practical needs?
- Does your lifestyle support having a baby?
- Do you have parents in the vicinity?
- Do you have friends with children?
- Do you have access to a babysitting co-op?
- Do you have enough money for babysitters?
- Are children accepted at your peer group functions?
- Are you willing to entrust the care of your child to someone else?
- Do you have support for your child-rearing theories?
- Are your child-rearing theories in conflict with other activities you are involved in?
- Is your physical environment (house, landlord, neighbors) suitable for having a child?

What are the global implications of deciding to have a child?

- How does this choice serve the planet?
- Will having a child enhance your being part of the solution to global crises, or part of the problem?
- How many resources will this child use up in his/her lifetime? [See *The Environmental Consequences of Having a Baby in the United States,* WE summer 1995.]
- Do you know how much additional pollution each child represents?
- Is this the time to be bringing more kids into the world, given all the problems our planet is facing?
- Can we afford more bodies taking up land space?
- Have you considered the per capita quantity of food input and fecal output?
- What quality of life do you want for your child, and is that realistic?
- Did you know that one child in the US uses 40 to 60 times the amount of resources a child in the Third World uses?



cartoon by L.J. Kopf

Book Reviews

Reviewed in this issue:

The Future of the Northern Forest

Earth in Mind

Unequal Protection

Voices for the Earth

THE FUTURE OF THE NORTHERN FOREST

edited by Christopher McGrory-Klyza and Stephen Trombulak; University Press of New England (Hanover, NH 03755); 1994; $40 hardback; 258p.

In the past few years, there has been a lot of talk about the "Northern Forest."

So begins an Abenaki contribution to this collection of essays, which in their entirety do indeed indicate the sudden self-consciousness of a region that hardly had a term for itself fifteen years ago—and certainly not the "Northern Forest" of today's land use discussions.

As the Abenaki contributors note in delineating their own historic connection to the land stretching from the Maine coast to the Adirondacks, a great tug of war, a sea of contending voices and powers has defined recent discussion of land use here. Events and trends in paper company holdings—land sales, liquidation cutting—have also drawn attention from the national conservation community, yet another contender in the tussle over the fate of the extensive woodlands of the northern New England and New York.

From many angles, academic and human, scholarly and economic, the essays united in this volume explore its title theme, some arguing particular points and others explicating conflict. The book is thus uneven, much like a conference with an endless stream of speakers, thematic unity and depth sacrificed to range and inclusion. What emerges, however, is a sense of a particular moment and phase in history, as the region struggles with a budding ethics of place. This mosaic of presentations offers the reader a glimpse of a maturing debate and dialogue—and, possibly, consensus.

Supporters of wildlands initiatives in the Northern Forest will benefit from perusing the entire work. Together, the essays draw a picture of the circumstances that have hamstrung the succession of governmental task forces that have addressed Northern Forest issues, starting in the 1980s with the Northern Forest Lands Study, the Governors' Task Force, and the recently disbanded Northern Forest Lands Council. No wholesale regional or federal initiatives have protected land across the Northern Forest nor addressed the ongoing process of forest fragmentation, while individual state efforts and non-efforts reflect prevailing economic interests.

In perhaps the book's most compelling essay, Carl Reidel, a Vermont representative on the GTF, recapitulates the history of past public efforts to forge consensus around meaningful policy. He describes the forces and counter-forces that both created and check-mated the governmental effort to implement innovative conservation strategies. Reidel suggests that the long-term effect of timber industry stonewalling of public land acquisition and greenlining initiatives may prove to be broader public support for an expansive approach to establishing biological reserves. Also contributing to such support will be this landmark volume. ▮

Reviewed by Andrew Whittaker (POB 72, East St. Johnsbury, VT 05838), Northern Forest Forum *associate editor*

Birch Trees, *woodcut by Patrick Dengate*

EARTH IN MIND: On Education, Environment, and the Human Prospect

by David W. Orr; Island Press, Washington, DC; 1994; $16.95; 213p.

Cultures reproduce themselves through the process of education and indeed indoctrination of their children into the world view held by the adults of that culture. Anyone presently involved in education and concerned with future directions of modern culture would do well to read David Orr's *Earth in Mind.*

Orr makes a strong presentation of the idea that today's society has not a problem *in* education but a problem *of* education. Through a series of finely-crafted essays, Orr challenges the very foundations of our educational system.

In part one of the book, Orr takes a critical look at education today. What is the purpose of education and are we educating for the right reasons? Orr not only provides the answers but also formulates a series of changes that should be made to ensure a sustainable future.

In part two, Orr introduces principles and concepts that he thinks should be a part of everyone's education, contrasting these with concepts of the modern world view. Orr suggests that our present ability to develop mechanical technology is merely human cleverness. Intelligence, on the other hand, can be demonstrated by thought and action that separate "know how" from "know why." Intelligence leads one to think through a process and all possible outcomes before proceeding, and upon completion to take full responsibility for the outcome. Modern society is a great inventor of gadgets and the intricately trivial while being oblivious to possible consequences of such invention. An education with Earth in mind would begin to teach reflectively and realistically about life and the world around us.

In part three Orr questions many of the foundations of today's education institutions. How are educators rewarded and is the system of tenure adequate to address sustainability? How have university systems been influenced by "helpful" corporate and government funding? How has such influence determined what is taught and researched? How have educational buildings been constructed? Do we try to incorporate sustainability into our building process? These institutions should work to ensure that the teachers and administrators are ecologically literate and able to address issues of sustainability in their work. The students graduating from these schools need to have the practical knowledge and ability to be responsible citizens of the biotic community.

Part four examines our collective future. Orr remains optimistic and suggests that we can develop a sustainable future. Throughout the book he points to guides and facilitators of this process. Placing hope in biophilia, Orr states, "Education that builds on our affinity for life would lead to a kind of awakening of possibilities and potentials that lie largely dormant and unused in the industrial-utilitarian mind" (205).

Throughout *Earth in Mind,* Orr presents complex issues in a well thought out manner while avoiding the use of academic jargon that might alienate readers. *Earth in Mind* is a book for all who are committed to a restructuring of institutions of education. ▮

Reviewed by Michael Horak (2125 E. River Terrace 106, Minneapolis, MN 55414), former fisheries biologist, current graduate student in education at the University of St. Thomas, St. Paul, MN

UNEQUAL PROTECTION: Environmental Justice & Communities of Color

edited by Robert D. Bullard; Sierra Club Books (730 Polk St., San Francisco, CA 94109); $25; 400p.

What do you think of when you hear the term 'environment'? The immediate pictures coming to my mind are of wilderness—lakes, mountains, deserts, forests.... Farther back is knowledge of the more technical definition, which is the complete surroundings of an individual. This includes our homes, work places, schools, and towns. Is it possible that as we work so hard to preserve and expand the natural environment we are neglecting a whole segment of society which needs our efforts every bit as much as wilderness?

Before reading *Unequal Protection: Environmental Justice & Communities of Color,* I would have been tempted to answer no to the previous question. Robert Bullard, the editor of this book, has done a superb job of opening my eyes (and heart) to the ongoing struggle against environmental discrimination by providing very specific examples of a variety of environmental and human health threats from the perspectives of those immediately involved. With this first-hand experience, many of these communities find empowerment through their anger and fear, pulling together and overcoming education and language barriers to wage political war against the sources of the pollutants. I believe this book should be required reading for anyone concerned about the environment because it deals with the justice questions that are not in the daily language of the mainstream movement. There is too much evidence of the unjust environmental problems being experienced by minority communities portrayed in these essays to be ignored any longer.

There are people being poisoned by toxins pumped into their environment or left near their homes and work places by uncaring corporations. Most of the communities affected consist of a high percentage of minorities. Our government has done little to stop this pollution. It has put the burden of proof on those being poisoned instead of those who inflict the harm. Damage from toxins such as PCBs or DDT is never easy to prove, but when you're a resident of a low income minority community (sometimes not even English speaking), with a much lower education level, that burden becomes near impossible. This book presents clear statistics proving that the major burden of environmental pollution falls upon African American, Latino American, Asian American, and Native American citizens.

There is encouraging news, though. This mixture of minorities has begun to come together. On the weekend of 25-27 October 1991, in Washington, DC, the historic First National People of Color Environmental Leadership Summit was held, marking a major step forward in the national movement for environmental justice, proving that a multi-racial alliance can occur around the multitude of issues involved with environmental justice. *Unequal Protection* is a compilation of essays written mainly by participants in the environmental summit.

Following a foreword by Congressman John Lewis, a preface by Reverend Benjamin Chavis Jr., and an introduction by Robert Bullard, part I begins with a history of the early struggles of minority communities which constituted the awakening of the environmental justice movement. Describing in detail the plights of Triana, Alabama (rated the unhealthiest town in America in 1980), and Warren County, North Carolina, this section outlines the strategies that have helped minority communities succeed in their fight for civil rights.

Section II continues the focus upon the lives of people in areas where high concentrations of industrial pollutants are prevalent. Part III, the final section of this book, is an overview of some of the many alliances being formed between grassroots and mainstream environmental and social justice groups of color. It discusses their views as to what needs to be changed on the government level and elsewhere to eventually eliminate environmental discrimination altogether.

An acknowledgment of the continuation of the civil rights movement through an environmental perspective, this book is a moving and educational portrayal of the cruelty and damage to human life inflicted by corporations and government upon mostly minority communities, and an encouraging depiction of the empowerment of those communities through coming together in their fight for justice. Unknown to many, including myself before reading this collection, prejudice and racism have continued unchecked in this country affecting the most basic of human needs: survival. As prominent activist Benjamin Chavis Jr. states: "It is unlikely that this nation can solve it's environmental problems without addressing the environmental justice question."

The editor of this book calls it an effort "to reach the mainstream and grass-roots environmental and social justice movements." I believe it signifies the hope that all of these organizations will eventually work together in support of environmental justice for all. In the words of Congressman John Lewis, "This shared vision makes for a stronger movement when diverse groups, organizations, and communities view environmental justice as a right of all, not a privilege for a few." ▮

Reviewed by Kathryn Fletcher, Wild Earth *intern*

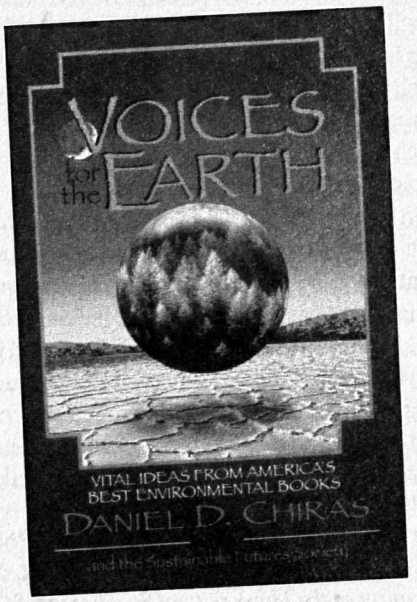
VOICES FOR THE EARTH: Vital Ideas From America's Best Environmental Writers

edited by Dan Chiras and the Sustainable Futures Society (5947 Brook Forest Rd. Evergreen, CO 80439); Johnson Books; Boulder, Colorado; June 1995; $16.95 paperback; 256pp.

If you don't have time to read all the wonderful environmental and ecology books at your favorite bookstore, buy this one and get the best of them all. A panel of distinguished thinkers from around the country selected America's Best Environmental Books, and Dan Chiras edited the best of the best into this volume. The authors share fresh new perspectives on sustainability. The book is a project of the Sustainable Futures Society, a national non-profit dedicated to furthering our understanding of sustainable policies and practices.

The theme of the book is systems thinking, not exactly like Peter Senge's *The Fifth Discipline*, but certainly a biological, futurist approach to systems thinking. Many diverse perspectives are offered, from Anne LaBastille's heartwrenching story of trying to save the Guatemalan Grebe to Dave Foreman's samurai approach to saving the entire planet. All the writers have *passion* and they focus their passion on solutions, not just sad sagas of despair.

The combination of passion and solutions is what differentiates *Voices for the Earth* from so many other environmental books. And the solutions are fairly simple, not easy, but certainly simple. Many of them can be effectively carried out by a single person or a household. Others need the critical mass of hundreds of thousands joining forces for change.



Donella Meadows, in her 20-years-later look at world systems, suggests six steps, one of which is the simple act of minimizing our use of non-renewable resources. Both Meadows and Chiras distinguish between "growth" and "development." To be sustainable, we humans need to focus on development, meaning improved quality, instead of upon growth, which means quantitatively more, bigger.

One of my favorite writers is Garrett Hardin, retired professor of the University of California at Santa Barbara. In this excerpt from *Living Within Limits: Ecology, Economics, and Population Taboos*, Hardin warns against promiscuous altruism—aid to developing nations that cannot be saved.

In his summary of *The Economic Pursuit of Power*, Thomas Power offers a combination of business and cultural solutions. He says most of us approach the future by looking at the past, sort of like a driver who steers his car by looking only in the rear-view mirror. Power says that during a local economic shift, the last idea to change is the collective understanding of what specifically drives the local economy. Often, residents and chambers of commerce neglect to account for the environmental factors of a place. Power suggests looking at a wider view. "If we want to get a full measure of local well-being, we have to look not only at monetary income but also at the local cost of living and the value of the goods and services residents receive from their natural and social environments." He estimates that not much more than 10% of all our economic activity is focused on providing things necessary to biological survival. The other 90% of our economic activity is about the production of attractive but distinctly discretionary qualities. This is where the margin for change exists. If we as consumers reflected seriously on this concept, we would find it easier to vote with our dollars for a sustainable future.

Stephen Schmidheiny also takes the business approach to sustainable development with the term "eco-efficiency," which links business, the environment, and the increasing needs of this generation with those of future generations. "Efficiency keeps companies competitive. It adds the most value with the least use of natural resources, and it is crucial in the fight against mass poverty in the world."

Clearly, while few would argue against that, it seems that few are taking up the samurai sword with Dave Foreman. Professor James Swan wanted to know why. He investigated why people care about nature. Psychologist Abraham Maslow told Swan that "all the self-actualized people he had studied seemed to have a deep reverence for nature and took delight in natural beauty." Swan's own research found that people who felt truly connected to nature were more successful, had a higher level of mental and physical health, and were more at peace with themselves and their world. This alone should be a major motivation to work toward sustainability.

Editor of this anthology Dan Chiras offers a systems approach to sustainability. He points out that the biological principles of sustainability (conservation, recycling, renewability, restoration, and population control) confront the root causes of our problems.

The finale of *Voices for the Earth* is a heartening vision of the future by Worldwatch Institute from its annual book, *State of the World*. Lester Brown, Christopher Flavin and Sandra Postel offer word pictures of a sustainable society. Some of their ideas make so much sense, it's hard to understand why people aren't already implementing them.

Chiras has done a fine job of compiling the best of the positive authors for a sustainable future. This book ought to be a topic for salons, discussion groups, and formal education. It's also good reading for everyone who loves children and grandchildren, and wants to leave a better world for them. ▮

Reviewed by Elizabeth V. Gardener, Conservation Officer, Denver Water

Other Recommended Titles

Green Rolling Hills, Video Documentary: Doug Hawes-Davis; Videography: Eric Gravley; Soundtrack: Ned Mudd and the Swampdogs; Ecology Center Productions (101 E. Broadway, Suite 602, Missoula, MT 59802) VHS 29 minutes, $15.

Green Rolling Hills documents the causal history and potential impacts of the proposed largest pulp mill in North America, slated for the tiny Ohio River town of Apple Grove, West Virginia. Addressing issues from the disempowered, depressed communities of Mason County and throughout Appalachia to the global deforestation crisis, this is a video account of collusion between government officials and the multinational corporation Parsons and Whittemore. (WV Governor Gaston Caperton has secured a $200,000,000 tax break for Parsons and Whittemore.)

Beyond the threats to public goods like water, air, and National Forests would be the virtually unregulated clearcutting of private lands, if the pulp mill is built. The forests of southeast Ohio and West Virginia have returned from devastation wrought at the turn of the century. Despite formation of three National Forests in the region, most of this area is privately held and the incentive to log again is greatly increased by the proposed mill (estimated output of 3600 metric tons bleached pulp per day). Mark Rey, former VP of the American Forest and Paper Association states, "because the forests are more privately owned than publicly owned the amount of conflict over their management seems to be substantially less."

Janet Fout of Ohio Valley Environmental Coalition laments, "the out of state speculators promise jobs and prosperity...it's a boom and bust kind of thing, and after the resources are gone so are the companies. They leave us with the mess to clean up."

Hawes-Davis and Gravley were able to travel and film a tremendous amount on a tiny budget. Activists should organize their own local cable or PBS showing; *Green Rolling Hills* is an excellent organizing tool and model for low-budget documentaries. Everyone should see *Green Rolling Hills*; it is a testament to a country lost and confused; a culture thoughtlessly struggling to perpetuate an industry built on exploitation of people and forests.

Reviewed by Jason Halbert, Native Forest Network, Missoula, MT

Other Recommended Titles

Principles of Conservation Biology, by Gary K. Meffe and C. Ronald Carroll; Sinauer Associates, Sunderland, MA; 1994; $46.95; 557pp; 250 illustrations

Principles of Conservation Biology is the latest addition to the textbook coverage of conservation biology. The book provides an overview on all topics of interest to anyone involved in conservation issues today. Besides excellent coverage of basic biological principles in sub-disciplines ranging from population ecology and genetics to reserve design, the book also delves into environmental ethics, ecological economics, sustainable development, and ecological restoration. The list of more than 50 outside contributors reads like a who's who in the fields of environmental ethics and conservation biology, including Reed Noss, Paul Erhlich, Martha Groom, Fred Allendorf, Adrian Forsyth, David Orr, Laura Tangely, Stanley Temple, Holmes Rolston, E.O. Wilson, Peter Raven, Elliot Norse, Susan Bratton, Rod Nash, and Robert Costanza.

As a textbook for upper division or graduate courses in any area of conservation biology or environmental studies, *Principles* fills the bill. I believe *Principles of Conservation Biology* should be the first stop for any biologist wanting to gain an overview of any conservation topic outside their area of expertise, and it is an excellent general introduction for everyone else.

Reviewed by George Wuerthner, Box 3975, Eugene, OR 97403

Mountains and Plains: The Ecology of Wyoming Landscapes, by Dennis Knight; Yale University Press, New Haven, CT; 1994; $40; 352pp

Dennis Knight is a professor of botany at the University of Wyoming. Not surprisingly, his book *Mountains and Plains* is focused on Wyoming; nevertheless, it provides a general overview of basic ecology of the Western landscape written in a non-technical style which covers grasslands, riparian zones, sagebrush steppe, forest ecosystems, and alpine tundra. After these basic chapters, discussion of specific landscapes follows, including reviews of Yellowstone, the Tetons, and the Black Hills.

Issues like herbivore impacts on vegetation (notably Elk effects upon the vegetation of Yellowstone) and prairie dog influence upon grasslands get special attention, as do fire ecology and other disturbance regimes. Although Knight touches upon these controversies with the skill of a diplomat, he comes down firmly on the side of minimal human manipulation with restoration of ecological and evolutionary processes as a goal.

Reviewed by George Wuerthner

The Tree in the Ancient Forest, by Carol Reed-Jones, illustrations by Christopher Canyon; and ***Little Brother Moose*** by James Kasperson, illustrations by Karlyn Holman; Dawn Publications (14618 Tyler Foote Rd., Nevada City, CA 95959); 1995; $6.95 each.

For children ages 4-10, these books appealingly present the interrelatedness of elements in the natural world. In *The Tree in the Ancient Forest*, richly colored pictures and a poem with cumulative details describe an old-growth tree and the wildlife that interacts with it. In *Little Brother Moose*, text and sensitive watercolors tell how a Moose escapes from a town to the forest by listening to the voices of flying geese. Children and adults guiding them will find both books very good.

Reviewed by Mary Byrd Davis, WE Associate Editor, and grandson Sammy Short

Scorched Earth: The Military's Assault on the Environment, by William Thomas; New Society Publishers (4527 Springfield Ave., Philadelphia, PA 19143); 1995; $16.95 paper; 227p.

Scorched Earth gives us a searing overview of the devastation that twentieth century war and preparations for war wreak on the environment. The book is at its best when the author, a veteran of the US Navy, writes from personal experience, as of the Gulf War. His written sources are largely secondary—publications like *The Vancouver Sun* and *Earth Island Journal*, rather than scientific studies or government documents. The volume thus serves as a starting point for further research and for action rather than as a definitive account.

Reviewed by Mary Byrd Davis

Listening to the Land: Conversations About Nature, Culture and Eros, by Derrick Jensen; 1995; Sierra Club Books (100 Bush St., San Francisco, CA 94104); $15 paper; 332 p.

As the subhead portends, *Listening to the Land* is a collection of edited interviews Jensen conducted with thirty pioneering thinkers—conservationists, philosophers, indigenous activists, artists, and academics from various disciplines—centered on our culture's war with nature. Though his questioning is occasionally mawkish ("Does the word *love* apply?" "How did writing *Overshoot* change you?"), Jensen does engage his subjects in a discursive and provocative dialogue. From the opening conversation with Dave Foreman to the concluding one with Terry Tempest Williams, *Listening to the Land* is filled with the musings of luminous intellects: Christopher Manes, Charlene Spretnak, David Ehrenfeld, Jerry Mander, Neil Evernden, William Catton Jr., Sandra Lopez, Dolores LaChapelle, Paul Shephard, and divers others. And truly, who could resist a book that has Reed Noss batting cleanup to Starhawk?

Reviewed by Tom Butler, WE staff

Black-tailed Prairie Dog (Cynomys ludovicianus) *by Evan Cantor*

Announcements

Forest Reform Rally

The 9th Annual Forest Reform Rally will be held 28 September through 2 October 1995 in the Ozark Mountains of Ponca, Arkansas. The rally will be held in conjunction with the Newton County Wildlife Association's 20th Anniversary Forest Fest and the Ouachita Watch League's Fall Fest. Presentations and workshop topics include old growth forests, the Endangered Species Act, GIS mapping, fundraising, and outreach, as well as emphasizing campaigns against international corporate deforestation and forest salvage sales. For information contact Newton County Wildlife Association, POB 189, Jasper AR 72641; 501-861-5600.

Natural Areas and Eastern Ancient Forest Conferences

This year's Natural Areas Conference, "Exploring the Power of Collaboration," will be held 25-28 October at the University of Arkansas Center for Continuing Education in Fayetteville. It will emphasize cooperative approaches to ecosystem management. Concurrent meetings include the Eastern USA Ancient Forest Symposium, Association for Biodiversity Information (28-29 October), and USFWS Bottomland Hardwood Symposium. For registration information, contact Shellie Melson, University of Arkansas, Division of Continuing Education, #2 University Center, Fayetteville, AR 72701.

TWP Staff Opening

The Wildlands Project is seeking a development director with a proven record in fund raising, including seeking major donors, writing grant proposals, and organizing events. (TWP is not a membership organization.) Salary commensurate with experience. Send resume, references, examples of work to The Wildlands Project, PO Box 1276, McMinnville, OR, 97128.

NAS Wetlands Report

On 9 May 1995, one day before the House began debate on a revision of the Clean Water Act that would reduce federal protection for wetlands, the National Academy of Sciences published a report to Congress titled "Wetlands Characteristics and Boundaries," which rejects the basic criteria of the bill. The 268-page report, compiled by a panel of 17 wetlands experts, makes it clear that the approach called for in the bill has no basis in science and the proposed definition of a wetland has no similarity with the scientific definition. Although the report does not comment directly on the legislation, it may be the most thorough argument raised against the bill. The House passed the bill in May and referred it to the Senate. No further action has taken place as of late June, so it's not too late to kill the bill. Copies of the report are available for $37.95 plus shipping and handling from the National Academy Press, 2101 Constitution Ave. NW, Box 285, Washington, DC 20055.

Johnnie Sagebrush Is Back!

"Coyotes Sing All Night," a new album released by the Coyote Angels, is a tribute to all those who have defended America's wildlands from destruction. Lead singer and songwriter Bart Koehler's true ballads of conservation history include such heroes as Aldo Leopold, John Muir, Ed Abbey, and Dave Foreman. The album's 18 songs (69 minutes) are a mixture of country, folk, campfire, blues and High Plains rock music. Twenty percent of all album sales generated from this announcement will be donated to *Wild Earth*. Order a cassette ($6) or a CD ($10) from Coyote Raven Music, POB 21106, Juneau, AK 99802; 907-586-6942. Mention this announcement when ordering.

Planet Drum Bioregional Directory

The latest issue of *Raise the Stakes: The Planet Drum Review* is a new bioregional directory and map. Published biannually by Planet Drum Foundation, the directory now lists more than 200 bioregionally oriented publications, organizations, and individuals throughout the US and other countries. Copies are available for $5 from Planet Drum, POB 31251, San Francisco, CA 94131.

Eastern Woodlands Center

Arctic to Amazonia Alliance, a non-profit organization based in Vermont, is seeking people and organizations interested in helping to establish an Eastern Woodlands Forest Cultural Center, which would serve as a location for activities and research within the forests of eastern North America. Planned projects include subsistence arts, native plant nursery, youth environmental rehabilitation corps, agro-ecosystem research, and traditional rural arts workshops. The Center will focus on the native environment, local community involvement, and biological and cultural diversity. To make a donation or receive information, contact the Arctic to Amazonia Alliance, Land Base Project, POB 73, Strafford, VT 05072.

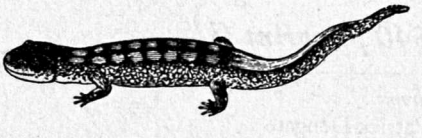
Low Impact Paper

Tradition Bond, an American-milled, tree-free plus post-consumer waste paper is now available. The paper is a blend of 10% hemp, 10% esparto grass, 60% agricultural byproducts, and 20% post-consumer waste. This is the first hemp content paper in many a decade to be produced in the US, and it satisfies all industry standards. Special arrangements can be made for non-profit groups if they buy collectively. Carolyn Moran, Editor of *Talking Leaves* journal, spearheaded this effort. For a sample copy of *Talking Leaves*, printed on Tradition Bond, send $5 to DEEP, 1430 Willamette St., #367, Eugene, OR 97401; 503-342-2974.

Salvage Mania and the Forest Health Sham

Wild Earth readers are encouraged to read and disseminate the Greater Salmon-Selway Project's publication "Salvage Mania and the Forest Health Sham: The Big Lies of Ecosystem Management," written by Howie Wolke. The publication reveals the phony "forest health crisis" created by the Forest Service, the timber industry, and various Western congresspersons. Spreading half-truths and mistruths, these timber interests claim that fire suppression (ironically, done mainly by the Forest Service) has created a crisis of potential catastrophic blazes due to unnatural fuel buildups, insect epidemics, and generally diseased forests. The Forest Service proposes to restore balance by *increasing* logging and road building—precisely the activities that have created the crisis. New logging will be termed "salvage cutting" and "ecosystem management," under the guise of "forest health."

The publication outlines the various "salvage" logging projects proposed by the Forest Service. It also proposes an alternative plan that makes ecological and economic sense. For copies of "Salvage Mania," contact Greater Salmon-Selway Project, POB 318, Conner, MT 59827.



STAFF NOTES

Development Director Marcia Cary has left her full-time duties to relocate to upstate NY where she and long-time *WE* subscriber Jason Kahn were wed in early September. Marcia will continue to oversee business and development matters during a transition period. Her colleagues accept Marcia's departure with regret, and are grateful for her years of service to *Wild Earth*; we wish Marcia and Jason a long and wild life together.

We also bid farewell to Administrative Assistant Shannon Galiga, with our thanks and good wishes.

The Cenozoic Society board of directors acknowledges the contributions of outgoing board member Kris Sommerville, and is pleased to welcome new members Katie Scarborough and Stephanie Mills. Katie is well known among conservation activists from her tenure with the Alliance for a Paving Moratorium and as a founder and co-director of ROAD-RIP. Writer Stephanie Mills edited the much-praised anthology *In Praise of Nature*, and is the author of *Whatever Happened to Ecology?* and *In Service of the Wild: Restoring and Reinhabiting Damaged Land.* Katie and Stephanie both reside in Michigan.

ABOUT SUBMISSIONS

Artwork, **articles** and **letters** should be sent to the Art Director or Editor at our main address (POB 455, Richmond,VT 05477).*Wild Earth* welcomes submissions of original illustrations or high-resolution facsimiles thereof. Botanical/zoological/landscapes are eagerly sought, with depictions of enigmatic micro-flora especially prized. Representational drawings should include common and scientific names.

Articles and letters should be typed or neatly hand-written, double-spaced, and include a return address and word count on the title page. Those who use a computer **should include a copy on disk**. We use Macintosh (3.5" disk) but can usually convert from PCs. Writers should enclose self-addressed stamped envelopes. Deadlines are Jan.1, April 1, July 1, and Oct. 1 for spring, summer, fall, and winter issues, respectively.*Wild Earth* has a large and growing backlog of accepted articles. Thus, unfortunately, authors of lengthy articles must expect a delay of a year or more before their article sees print, even if it is accepted.

Poems should be sent directly to our Poetry Editors, Art Goodtimes (Box 1008, Telluride, CO 81435) and Gary Lawless (Gulf of Maine Books, 134 Maine St., Brunswick, ME 04011). Poets should realize that we receive scores more poems each quarter than we can publish.

Articles, if accepted, may be edited down for space or clarity. Articles with significant scientific content (e.g., most biodiversity reports and wilderness proposals) will be reviewed by our Science Editor for accuracy and clarity. Wilderness proposals will also be reviewed by our Publisher, and controversial or complicated pieces may be peer reviewed. Lengthy biologically-based articles generally should include literature citations.

Wild Earth occasionally reprints articles; but due to the surfeit of submissions we receive, reprints will usually be low priority. If an article is being submitted to other publications as well as *Wild Earth*, the writer should indicate so. We usually try to avoid duplication. We generally welcome other periodicals to reprint articles from *Wild Earth*, provided they seek permission in writing from the author and *WE*, and properly credit the articles.

In matters of style, we follow the *Chicago Manual of Style* loosely and Strunk & White's *Elements of Style* religiously. Also, we suggest that authors remember several basic rules when writing for *Wild Earth*, since we always have far more material than we can print and we expect our writers to be lucid, perspicacious, and ineffably winsome.

1. Eschew surplusage (Twain 1895).
2. Do not affect a breezy manner (Strunk & White 1959).
3. Watch your antecedents (Davis 1988).
4. Thou shalt not verbalize nouns (Abbey 1988).
5. Include a goldarn floppy (Butler 1992).
6. Mix drinks, not metaphors (Davis 1993).

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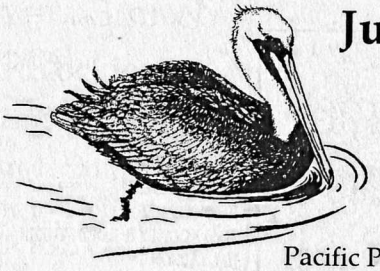

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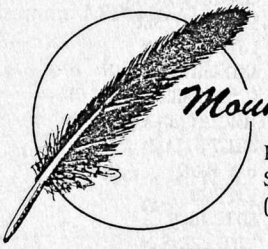

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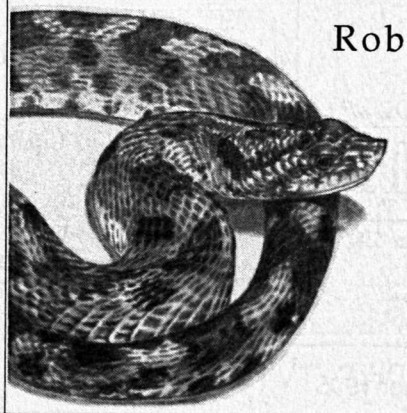

Robert M. Smith

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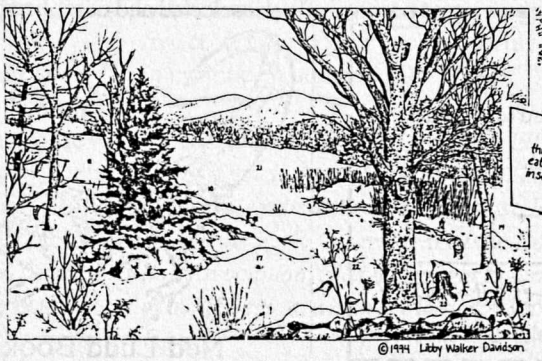

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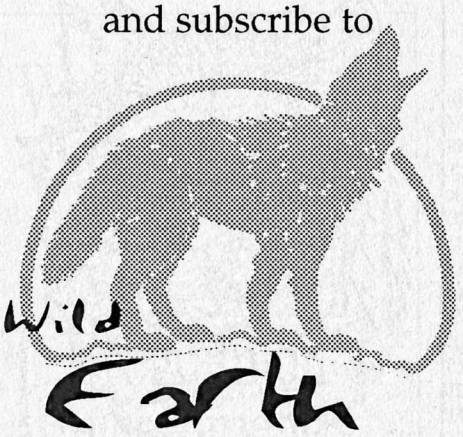

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wild earth for your friends

Northern White Oak, Raccoon, Starflower, Snowy Tree Cricket, Purple Trillium

Starflowers (meditation on rabies) 1995, watercolor 11" x 15" by Bob Ellis

Since this vibrant image invites subjective commentary more than it does scientific description, we'll let readers unearth the taxonomic details on these five species for themselves. We'll offer instead an unabashedly opinionated view, focusing on the plants.

These species typify a northern hardwood or transition forest. None of these is federally listed as Threatened or Endangered; yet each of these, excepting perhaps the opportunistic (though here decidedly moribund) Raccoon, probably reaches its full potential only in the East's remnants of original forest.

Old-growth Northern Red Oak (*Quercus rubra*) can attain heights of 120 feet and circumferences of 15 feet after growing for several centuries, in contrast to the spindly young oaks of regenerating logged areas. Purple Trillium or Wake-robbin (*Trillium erectum*)—whose less flattering common name is Stinking Benjamin, due to its insect-enticing rotten meat smell—lavishes color on mature northern hardwood forests but, being vertical and sessile, disappears with clearcutting. Starflowers, too, bespeak healthy woods; you'll not find them in pine plantations. Look for their small white petals beneath deciduous trees in spring just before the latter leaf. Snowy Tree Crickets (*Oecanthus niveus*) thrive in forests north to southern Canada, south to Georgia, and west to Utah, where they are occasionally mistaken for Mormon Crickets (*Anabrus simplex*).

Together, then, these relatively common yet not necessarily secure species make a point: Even for those species not obviously ill-disposed toward urban society (any of these five could live in your back yard), life is best in natural areas, in unsullied Nature. —*JD*

Artist and conservationist Bob Ellis (Millers River Watershed, Wendell, MA 01379) is a regular artistic contributor to WE. *While primarily a watercolorist, Ellis works in pencil and pen/ink as well. As president of the Bear Mountain Preservation Association, Ellis has fought to protect the flora and fauna of his bioregion, which are the inspiration for his paintings.* —TB

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