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WildEARTH



Spring 1994

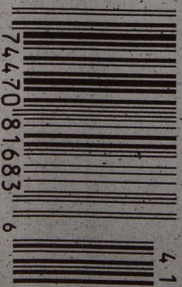
THE LATE, GREAT EDWARD ABBEY ON **THE ENEMY**

AQUATIC ECOSYSTEMS
REPORT FROM NEPTUNE'S NAVY
VACUUMING THE NORTHERN FOREST
MISMANAGEMENT IN THE SOUTHERN APPALACHIANS



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Around The Campfire

Never have a President and Secretary of the Interior so disappointed conservationists as have Bill Clinton and Bruce Babbitt. The firing of Jim Baca as BLM Director is simply the icing on a multilayered cake of betrayal. We shouldn't be surprised, though. Between nomination and taking of office as Secretary of the Interior, Bruce Babbitt told a group of conservation executives, "Don't count on me to do the right thing. You have to make me do the right thing. Conservationists need to be barbarians at the gate with the Clinton Administration."

We can't fault Babbitt for misleading us. In that regard he is a rare honest politician and a cut above Cecil Andrus as Secretary of the Interior. But where Andrus is a bare-knuckled alley fighter, Babbitt has as much spine as a loaf of white bread (unless he perceives you as being weak). Ed Abbey called him "Babbitt the Rabbit" when he was governor of Arizona. He has certainly played the rabbit against the timber barons in the Northwest ancient forests, against Big Sugar in the Everglades, against fastbuck developers in gnatcatcher habitat, and against the ranching gentry on grazing reform. Babbitt's boss, Bill Clinton, may be even less steadfast than Babbitt (and has none of the conservationist instincts of Andrus's boss, Jimmy Carter).

On each issue where Babbitt and Clinton have let down conservationists, we've asked, "Where's Al Gore?" Gore reportedly came to Baca's defense but was bested by Babbitt (not something to put on one's resumé). The expectations for Gore as Vice-President were akin to those for a prom date with the prettiest cheerleader. We should have been smarter. Instead of using his book *Earth in the Balance* as a window to the real Al Gore, we should have looked at his congressional record on conservation issues affecting Tennessee. We would have seen another Mo Udall.

But Babbitt warned us. Despite that warning, after the dark ages of Reagan and Bush, we wanted morning again. We wanted an administration and a Secretary of the Interior who would protect ancient forests, desert grasslands, wetlands, and Endangered species. We didn't get them. We will never get them. We will always get just politicians.

Now after Baca, let's listen to Bruce Babbitt and play the game we must: Make him do the right thing. Be barbarians at the gate of the Clinton Administration. Don't expect Babbitt to be our white knight.

I'm not suggesting that we treat Clinton like Reagan and Babbitt like Watt. Ronald Reagan and James Watt were anomalies. Let's go back a score of years to the Nixon and Ford administrations for a model. And even earlier to Interior Secretary Stewart Udall. We did not expect them to do the right thing. We didn't delude ourselves that those administrations were our friends, whatever their rhetoric (and some of their rhetoric was pretty good). No, we understood that we had to make them do the right thing for conservation. Their doors were open to conserva-



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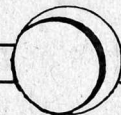
George Wuerthner

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WILD EARTH



SPRING 1994

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On the cover: Bald Eagle (*Haliaeetus leucocephalus*) by Gerry Biron

Around the Campfire...continued

tionists (unlike the out-of-kilter Reagan-Watt door). We skillfully applied pressure (as Brock Evans says, "Endless pressure, endlessly applied"). We applauded when they did the right thing—Udall supporting the Wilderness Act; Nixon banning 1080 and DDT, stopping the cross-Florida barge canal, issuing an executive order to control ORVs; Ford proposing an expansion of the National Park System. We were barbarians at the gate when necessary—against Udall on dams; against Nixon on the Alaska pipeline, the SST, Earl Butz's giving the National Forests to the timber industry; against Ford on his threat to veto a good bill for the Flat Tops Wilderness in Colorado.

We can't count on George Frampton to save our chestnuts any more than we could count on Nat Reed doing so during the Nixon-Ford years. But we can approach the conservation-oriented government officials appointed by Clinton and apply pressure without end. Then they can do the right thing.

Conservationists at all levels need to learn from the history of administrations past. From Earth First!ers in the trees to the Gang of Ten, we need to study history and learn how David Brower, Stewart Brandborg, Harry Crandall, Clif Merritt, Brock Evans, and the other conservation gladiators of that era fought and often won against the Kennedy, Johnson, Nixon, and Ford administrations.

We were suckered and taken to the cleaners by Cecil Andrus in Carter's administration; we had the door slammed in our faces during the Reagan and Bush administrations. We won't find models there for how to deal with Clinton, Gore, and Babbitt. We did a hell of a good job during the sixteen years of Kennedy, Johnson, Nixon, and Ford, however. We were tough without being so obnoxious that the door was slammed in our faces. We didn't expect them to do the right thing. We pressured them to do the right thing. True, we didn't always succeed. But we had a better record than we have thus far with Clinton and Babbitt.

It's time today's conservation movement shows the backbone David Brower and the Sierra Club showed against Johnson-Udall and dams in the Grand Canyon (we won), the backbone Stewart Brandborg and The Wilderness Society showed against Nixon and the Alaska Pipeline (we lost but lessened the damage), the backbone Colorado conservationists showed against Ford's threatened veto of the Flat Tops Wilderness (we won).

Remember Jim Baca. Remember how roars from mice like Ben Nightmare Campbell, Jeff Bingaman, and other Western Democrats turned Babbitt the Rabbit and Slick Willy into Bert Lahr lions.

It's time we sent a message to the politicians of the Democratic Party that they can't take us for granted. We have to go back to the strategy of the pre-Carter conservation movement. There we'll learn the way for conservationists to get respect again. There we'll learn the way to make Babbitt and Clinton do the right thing.



So much for the woolly bully pulpit. Let me squeeze in a little bit of *Wild Earth* housekeeping here. We've been told by folks in the know that quarterly publications like *Wild Earth* have a hard time making it financially. We're currently doing an analysis on whether or not to go to a bimonthly schedule (six issues a year). What's your reaction? Six slightly slimmer issues of *Wild Earth* a year for the same subscription price (and a lower cover price). Would you be more likely to resubscribe? Do you think more folks might subscribe? Send your comments to Marcia Cary in our Vermont office. She'd also appreciate any other comments you have on increasing our renewal rate and new subscriptions.

Happy Trails.

—Dave Foreman

Aravaipa Wilderness, AZ

Everyone agrees *Wild Earth* needs to be read by more people. Our niche may be small, but we have not yet begun to approach our carrying capacity. Our favorite publishing expert, Howard White, tells us an important source of new subscribers is the newsstand. With this issue we have done what is unthinkable in this day and age—we have decreased our cover price. This decrease is necessary to be competitive in the single copy sales marketplace. Of course, you will probably never see us alongside *People* or *Cosmo* in the supermarket. Look for *WE* in bookstores, co-ops and outdoor gear stores.

Members may wonder why they should subscribe to *WE* rather than pick up the issue from the co-op. The new cover price does not reflect actual production costs and it's likely that we will lose money on sales from the newsstand. The price reflects our desire to give the random economically-minded shopper a fair chance to buy *WE* instead of *Outside* or *Garbage*. We feel that once exposed to uncompromising advocacy for the natural world, they will join us. Your continued support as members of the Cenozoic Society is essential for the success of *Wild Earth*. You underwrite much more than the magazine's production—you support efforts to promote the North American Wilderness Recovery Strategy and the New Conservation Movement. With your help we can continue to produce *WE* without massive advertising campaigns and direct mail solicitation. We'll be able to represent the goals and beliefs *WE* stands for at conferences, meetings and other forums where it is important that a voice for restoration and protection of wilderness be heard. Also, members of the Cenozoic Society will continue to receive *WE* Special Issues and discounts on other Cenozoic Society publications, such as Mary Byrd Davis's *Old Growth In The East*.

This is an important year for *WE*. Staff changes and additions will allow us a real chance to make a difference in wilderness protection. Thanks for your help.

—Marcia Cary

It's What We Do...

Happy Spring. We have had a spectacular winter here in Vermont. As I write, snow is falling, each flake dancing gracefully in the sunbeams. Yesterday, I spent the day cross country skiing in fresh snow up to my knees, accompanied by a Barred Owl. Though winter has been glorious, I will welcome the spring.

Indoors, winter has been busy, and spring promises to be more so. In January I spent a week in Washington, DC with 75 dedicated activists delivering the book *Clearcut*. (See p.95.) We distributed to Administration officials and members of the House and Senate copies of the volume that should end clearcutting.

During my visit to DC, I began to understand what a schizophrenic feels like. I was inspired when hearing authors David Brower, Ed Grumbine, Dave Foreman...; furious when I heard from officials again and again, "We can't do anything, go elsewhere"; hysterical when photographers Elizabeth Feryl, Dan Dancer and Robert Glenn Ketchum shared their sorrow in photographing clearcuts; overjoyed when activist Jan Wilder Thomas sang at the book-signing; energized by the activists' devotion; angry when a Representative responded to *Clearcut* by saying, "This book is beautiful"; and satisfied when a Senator said, "This is disgusting, what can I do?"

The week in DC was a large success; but following up with letters and meetings, and encouraging congressional leaders to respond to the book by co-sponsoring NREPA and other strong biodiversity bills are actions just as important. Special thanks go to Doug Tompkins for his generosity, Georgetown Patagonia for hosting a book-signing, DC Sierra Club for organizing the week, and Bill Devall for his dedication. *Clearcut* is one of the most moving conservation tools ever created. Use it. Contact Rainforest Action Network to learn how you can get involved.

—Kathleen Fitzgerald

Let none accuse us of hebetude. Like activists throughout the New Conservation Movement, the *WE* staff works very hard—putting in long hours to produce this periodical and spread a vision of wilderness protection and recovery. The final hebdomad before an issue goes to press is particularly busy, and this time the staff mantra "More Wilderness—Less Office" rose from a low murmur to a full-throated holler. Thus, we aim to spend more time in the real world this year, and hope folks talking to the telephone answering machine will not begrudge us our time outside.

Readers will notice a change in the magazine's appearance. We've been looking for a more ecologically sound paper and, with the help of the good folks at Boston's Recycled Paper Co., have chosen Springhill's Incentive 100 as text stock for this issue. This paper contains 100% recycled fiber (50% post-consumer/50% magazine returns) and is not bleached with chlorine. The new cover stock is from Simpson's Quest line, and is made from 100% non-deinked, post-consumer waste. We've not yet located a non-wood fiber paper that is affordable and available in the sheet size our printer requires. Readers are welcome to assist in this search.

These changes will increase our production costs in a financial sense, but decrease them in an ecological one.

—Tom Butler

A cursory glance at our table of contents herein will disclose a problem: gender imbalance—we've only a few articles by women this issue. Unfortunately, this imbalance reflects the ratio of woman-authored articles to male-authored articles *Wild Earth* receives. We get several times as many articles from men as from women. If North America's wilderness recovery movement is to succeed on a grand scale, it must involve more woman leaders, organizers, biologists, and writers; and many of these ought to write for *Wild Earth*.

A second plea: invite Wild Earthlings to give a presentation on *Wild Earth* and The Wildlands Project to your school, club, group, or other collective entity. We are eager to spread wild words far and wide (big words, too, like bombastic, truculent, facinorous, and other epithets that we can hurl at land despoilers).

—John Davis



Librust

The Wildlands Project

Update

February, 1994

In the last several months the Earth may have become a little safer for some species. More and more we hear — albeit grudgingly at times — that all the science points us in one direction: if we are serious about valuing all life then we must restore large connected areas free from the ecological degradation that accompanies industrial and agricultural civilization.

The Wildlands Project has been concentrating its efforts to make such a system of wildlands (and waters) a reality in two major areas: completing a vision map for North America and beginning regional work on science and map-based reserve proposals.

We began vision mapping in November 1993 at Sagamore, New York, in the heart of the Adirondacks. There scientists and activists from the northeastern US and the Canadian maritime provinces met to draw the first lines. (See *Wild Earth*, Winter 1993/94, p. 4.) Based on data currently available, the participants — all of whom worked on the areas within the region they know — suggested core reserves and corridors needed to represent all ecosystems, maintain healthy populations of all indigenous plants and animals, and accommodate ecological and evolutionary processes.

The following month people from Yellowstone to the Yukon did the same for the Northern Rockies, outlining a plan to protect the remaining fragile links of montane valleys, and to restore connections to foothills and lowlands. (See *WE*, Winter 1993/94, p. 68.)

Over the next several months vision map meetings will take place in the rest of North America's major regions. The regional maps will be integrated into a continental map, sent back to the regions for a final look, and then published in large format as part of the next *Wild Earth* special issue on TWP. (Yes, our first fold out!) The vision map will also be published in poster format, suitable for framing, educating, inspiring and stimulating.

The vision map is an important step toward creating the biologically based and uncompromising vision needed to clarify what the protection and restoration of wildness requires. In creating a rough and conceptual first draft of what we need to achieve in the next few years, we will begin to define a position that no person or



The Wildlands Project

group who claims to care about the earth—or who desires to reduce it to resources—can ignore.

At the meetings held late last year TWP also initiated organizing efforts. To develop scientifically defensible regional reserve proposals, and to build them from the ground up, will require sustained efforts involving all committed conservationists and scientists. The process involves a coordinated region-wide effort to assess the state of wildlands and biodiversity, collecting data to fill in gaps, analyzing data, and completing the proposal narrative and maps. It will be an iterative process, with proposals going through several stages, including peer review of the science and integration into a continental context.

If you want to be part of the design process contact the local and regional groups or chapters of national organizations working with us. If you don't know who they are, or represent a group that wants to help, please contact the Tucson office at 602-884-0875. Both design and implementation of reserve systems will only be successful with support rooted in every part of North America.

Outreach and education efforts have continued, with presentations at meetings and media interviews. The conservation strategy has been translated into Spanish and is in press. It should be available by early spring for distribution. The first in a series of wildlands anthologies addressing important areas of

conservation policy is in press, thanks to the editing of David Burks. Its theme is the relationship of humans and wilderness. A self-contained slideshow, including narrative in English and Spanish, is being produced and should be available by late spring. Often times we can't afford to send speakers, and groups can't afford to bring us. The slideshow will provide information on the project when speakers can't. Both the conservation strategy translation and the slideshow production are being funded by World Wildlife Fund—Canada.

In late spring the main administrative office will move from Tucson to the Portland, Oregon area. This will enable science and administrative staff to work more efficiently. Watch for the new address and phone numbers.

If we are to be successful in creating an ecocentric vision and stemming the ongoing loss of biodiversity, we need your support, as do regional groups working with us. Please give at the level you can afford. Your contributions are tax-deductible. (Note that *Wild Earth* and The Wildlands Project are separate financial entities.) The more you give the more we can hope to protect.

—David Johns, TWP Executive Director

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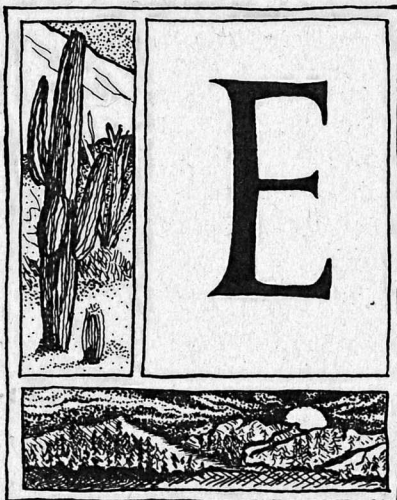
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The Enemy

by Edward Abbey

Millions of readers worldwide know the late Edward Abbey through the pages of his 21 published books — and by his reputation as a curmudgeonly, anarchic, comedic, poetic, hell-raising, lusty literary genius. But what is perhaps Ed's greatest literary work of all is only now about to see print: the 21 volume personal journal he kept across the last four decades of his life — from 1948, when he was a reluctant military cop in post-war Europe, until less than two weeks before his death in March of 1989. The following sneak preview is lifted from Journal XVI, and offers a taste of the flavor as a whole, while clearly defining Abbey's motivation for preaching, teaching, and living the cause of "radical" environmentalism, no matter what. —David Petersen (Box 2466, Durango, CO 81302)

August 5, 1978 — Aztec Peak fire lookout, Tonto National Forest, Arizona



vening and alone: My wind chimes tinkle gently. Storm cells growl and flicker in the north — thunder, lightning, curtains of rain. The sun going down in a solemn radiance of purple clouds, rimmed in scarlet.

Quietude. The distant cries of a hermit thrush — that flutelike song, deep in the dark and piney woods.

Why, in all this peace and beauty, should I trouble my soul with thoughts of war, politics, the endless battle to save a little of free, wild, agrarian America?

Why?

I don't know. Some vestigial sense of honor I suppose. The less honor we have left — after all these decades of compromise, trade-offs, cowardice, evasion, temporizing, equivocating, fence-straddling — the more urgently we cling to what sense of honor still remains. I love the hills and the fresh wind, the desert and the sea, the forest, the swamps, the rural towns of America. I am obliged, therefore, morally obliged, to defend these things against the Enemy. Honor requires it.

The Enemy? We all know who the Enemy is. The Enemy speaks to us all the time — from the radio, on the television, on billboards, in the newspapers and slick magazines, in the halls of Congress, at the state capitol, in city hall.

And the Enemy says, "Behold, how sleek and fat I have become. Am I not the wonder of the world? Am I not the richest and most powerful beast on earth? Would you turn against the thing which has enriched you, which has given you safety and security and comfort, which promises you still more wonders in the future — electronic, computerized thinking, a life air-conditioned from womb to grave, an existence of endless novelty, luxury, diversion, things and more things, a universe of sport and adventure and romance and travel in the softness of your armchair, the ease of your V-8 four-wheel-drive wheelchair tourism, the sedation of your living room? A painless, discreet, sedated death? And all this for so little, so very little — merely for the price of some of your independence, a bit of your freedom, a little part of your manhood or womanhood, for only a little sacrifice of your humanity and honor..."

Law and Order are not enough. Law and Justice is what I want. To hell with order! To hell with the law! I'll settle for justice, though the heavens fall.

(I realize this attitude is not merely a nuisance, but a great bore to almost everybody. I wish I could change; I wish I could adapt; I wish I could accept, with peace of mind, the standardized, institutional view of things. But I can't. There's something wrong with me. I'm a sick man no doubt about it.)

Excerpted from *Confessions of a Barbarian: Pages from the Journals of Edward Abbey*, edited by David Petersen. Forthcoming from Little, Brown & Company, Fall 1994.

In the Place of the Wild

by David Clarke Burks

The russet-haired poet sprawls his robust frame over the lectern before a crowd of students and teachers in the Gumwood Room of Memorial Union, shifting his weight from one leg to the other, from one continent to another. Mark O'Conner, an Australian poet from the leatherfern swamps of Queensland and the chalk desert sands of Alice Springs, has come to the west coast of North America, to the Oregon of cloud-pitching firs and volcanic peaks, to speak of animals and other things growing in his mind.

His words, laced with colloquial vowels from Downunder, are tracings of Pleistocene figures on cave walls, colorful flutings of placenames brushed with red ochre. His verses follow lines etched millennia ago by indigenous peoples. His poetry is landed, grounded in the animals and plants of his place. His poetic constituents are the native communities that follow the contours of watersheds over the great subcontinent.

Soft-spoken, his temperate demeanor belies a man whose home is the wild—the wild lands outback of the coastal urban fringe. The figures that work through his speech are of coral reefs, limestone caves, yellow-beaked honey eaters, mangrove swamps, crocodiles and white ibis. His red hair is curly like the burr of anecdotes that spill from his mouth. For O'Conner, there is no dividing line between the wild and the tame, the patterns inside and outside are one. Speaking of fire, he reads from one of his poems "The Rainbow Serpent": *I burn with hot indifference, follow/who feeds me best. And my best servants/died before speech was baked in clay.*

Some of us speak of the wild as a separate territory, beyond the reach of mind's cultured camera. Others, like O'Connor, carry the wild behind their eyes, like a reptile sculling its way through a swamp of lily pads. The poet forges links between the eye of the camera and the eye of memory. The inside wild and the outside wild merge in songs of place. In Roger Bacon's words, "The things of the world cannot be known except through a knowledge of the places in which they are contained."

Mark O'Conner carries the images, the sounds, the tastes of his place with him. Shearwaters, wallabies, mangroves and sandcrabs are more than metaphors. They are beings, valued for their intrinsic worth, for their native place in the order of things. Through poetic expression, we discover connections between humans and wildness and acknowledge our coevolutionary origins. "Poetry is the surprise of discovery," he interjects. It is the discovery of a common resonance, one that bridges Self and Other and defines vocation. He is an advocate for animals and plants in their fullest expression of wildness, not as human-created analogues drenched in domestic patronage. He is an advocate for the human voice that sings of the continuous unfolding of creation.

As I listen to his poems, my mind is drawn into an exploration of biophilia, what E.O. Wilson defines as "the urge to affiliate with other forms of life." It becomes clear, if there is meaning to life it can only be understood in relation to all life. And the posture to take is one

*...there is no
dividing line
between the wild
and the tame, the
patterns inside and
outside are one...*

of "reverence for life." Accepting the wild on its own terms, we might discover how splendid the world is without Adam and Eve and the patriarchs of Genesis. Deep rootedness engenders feelings of engagement, being a part of, rather than apart from, the sources of life. The poet discovers through walking the terrain of authentic language that, in the words of N.O. Brown, "All walking, or wandering, is from Mother, to Mother, in Mother..."

For a moment I am walking the tawny flanks of nearby Mt. Pisgah. Yellow cinquefoil and blue camas flowers wave in the breezes that furrow the meadow grasses. Two black-tailed does stand sentry at the margins in the shade of white oaks, while grey squirrels and Douglas squirrels rollercoaster the limbs of a giant maple. My place is a matrix of lines, of lives that are rooted and hold this place in shallow soil over layers of basalt. I am out of control, beyond any need to control. Then, I am back with the poet on a wake-raked coral caye.

*High by the long island's side
the rubble banks swim in the evening light
death-grey and bleached white, speckled together.*

*The Wind sings over the coelenterate dead
the hollow-gutted stone-sheath-dwellers
the lace-masons, the spicule shapers*

the island makers.

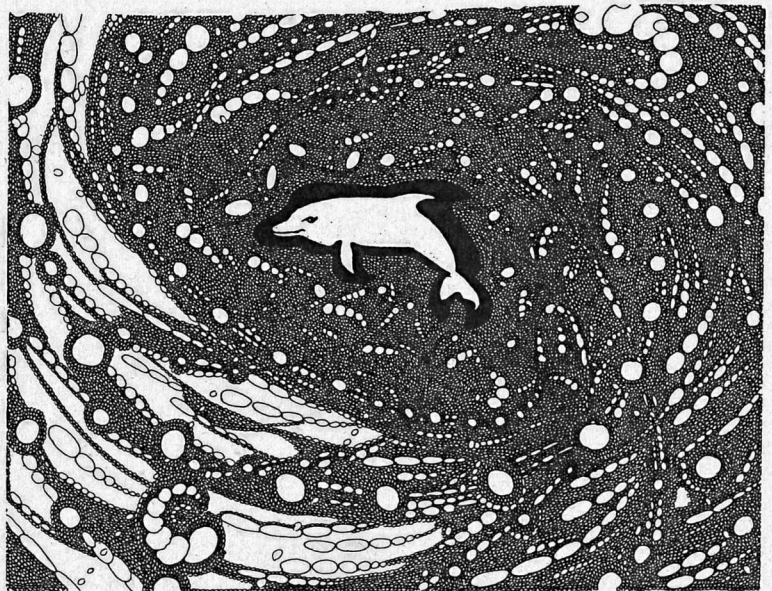
Stepping away from the lectern, the poet speaks as an advocate for preservation. "Australia, despite what you may have read in tourist literature, is not for human use, the sea around her not a human bathtub." What has come to be known as eco-tourism has most often been a thinly veiled disguise for continued commercial exploitation. As long as human-centeredness continues to obscure our understanding of native ecology, we will continue to deny our obligations to the preservation of life. With continued obedience to the tame, we fail to recognize the wild as a source of discovery. Finding and knowing one's place and the place of the wild involves letting go of material valuation and individual self-interest so that, in the words of David Orr, "it is not possible to love either humanity or nature without loving and serving the other."

Since at least the Neolithic era, humankind has been overlaying cultured premises on the caves of indigenous knowledge. Our search, at this juncture in history, must be to find ways to contain our impulses to domesticate the planet while preserving within acceptable limits the warmth of the hearth. As Orr writes,

"The ecologic crisis is about what it means to be human. And if natural diversity is the well-spring of human intelligence, then the systematic destruction of nature inherent in contemporary technology and economics is a war against the very sources of mind."

The poet ends his reading with a story. The night air in the deserts of central Australia can be frigid. Those foreign to the Outback wrap themselves in down jackets and long polypropylene underwear, and still their teeth chatter. However, the aborigines, when it is time to bed down, strip off their clothes and burrow into the hot sands, bathing their bodies in the Earth's warm breath. Crystals of starlight play in the ruffled waters of a nearby spring. Dingoes, Australian wild dogs with a wolf-like appearance, crowd around the dwindling campfire until they are called over to sleep beside the aborigines, sharing their warmth. One on each side, another at the feet. A cold night in these parts is called "a three dingo night."

The poet's narrative penetrated beneath the flow of cultured rhetoric, beneath historical analogues and linguistic artifacts, to the intimacy of relationship between humans and animals; to the sources of symbiotic relationship between culture and the wild. When the wild and the



tame are linked without harm to either, reciprocity is achieved. Reverence for life acknowledges the central place of reciprocity and linkage between all forms of life. To understand the source of imagination, to experience an emotional bond between ourselves and nature, we must preserve a world in which biophilia can flourish. This, in every sense, calls for the preservation and restoration of wild lands.

When you next find yourself Outback in the arms of a cold desert evening, or walking a mountain on a starry night near your home place, the Australian poet and I wish you "a three dingo night." Such is the beginning of a new/old covenant with wild lands, wild animals, and wild imagination.

David Clarke Burks is a writer, teacher, and editor of the forthcoming anthology on wildlands entitled Place of the Wild. He is a correspondent for Wild Earth and makes his home west of the Cascades in Eugene, Oregon.

Letters

DRIVING IN THE OPEN AIR

I'm quite willing to go along with the importance of various Norwegian authors/philosophers to the evolution of a deeper relation between humans and nature. I understand Norway is a lovely place, and deserves apprecia-

tion. But I cringe at the idea of importing the terminology of that country—is *friluftsliv* as much an improvement in enjoying the wild as *fahrfegnugen* is for driving? Will I have to buy Norwegian hiking outfits?

But that is, of course, only a polite jibe at our tendency to look admiringly at

other cultures. Would it be fair to ask if the Norwegian ethics end at the shoreline however? Only a reminder, as the Sea Shepherd Society might wish, that Norway has resumed commercial whaling in spite of the IWC moratorium, leading the way for other countries such as Iceland, Japan, and possibly Russia, Chile, Peru and Korea. Reaping the life of the sea is a tradition in Norway, not completely separate from an enthusiasm for other outdoor challenges. Let us hope the book *Wisdom in the Open Air* also sells in Norway.

Brian Carter, NH

P.S. *Fahrfegnugen*? Sorry, I don't drive a VW.

Hunter S. Thompson pegged it right: welcome to the death of the American Dream. We the People relinquished control over our own destiny when we decided not to think for ourselves. Why not arbitrarily (and capriciously!) fix that date as 1828? The year that Andrew Jackson was elected President of the United States.

Alexander Hamilton must be chuckling from whatever obscure astral plane he inhabits. Not that he could appreciate the pseudo-populist, good-ole-boy shenanigans of America's seventh President. Rather, our ghostly fop would enjoy knowing that an entire nation of democrats could so easily be had. It stands to reason that if a 19th Century President can buy the White House with cheap corn whiskey, modern-day corporations can PAC their way to the stars.

In fact, America is owned by the Fortune 500. Hence, we end up with the government we deserve. As our most affable pundit, Benjamin Franklin, is reputed to have said upon exiting the signing of the Constitution: "We gave you liberty; now

STATEMENT OF PURPOSE

Wild Earth is a non-profit periodical serving the ecocentric grassroots elements 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.

DOCTOR'S FINAL REPORT?

PCBs in Choccolocco Creek. Organo-chlorines hitch-hiking out of Little Rock, hoping to spare Brother Bill's Ensemble more embarrassment. White Water, indeed. EPA's newest sparkling dioxin risk assessment moving along at a slug's pace, leaving a slimy mucilaginous trail in the direction of Pennsylvania Avenue.

Erratum

Mitch Lansky's article *The Northern Forest: Working Forests That Would Rather Not* (WE Winter 1993/94) contained the following inaccurate line:

In 1982, British financier Sir James Goldsmith did a leveraged buy-out of Diamond International, which owned over a million acres (including 58% of my town) in the four state region.

The actual percentage was 85%.

let's see if you can keep it." Or words to that effect.

The Doctor apologizes for the lengthy hiatus. Things have not been good, what with Peggy Sue running off with a truck driver. Not to mention the lingering haunt of DTs. But then, dark hotel rooms take their toll on even the toughest skins. It is a sleazoid job; somebody had to do it. They chose me. I am Dr. Dioxin and this is the Toxic Trail.

I have taken to sleeping late by increasing the proof of my libation. At least some semblance of silver lining remains: the Doctor discovered a miracle of the Bluegrass State—Baker's 107. Pure mystical straight Kentucky bourbon whiskey of the highest caliber! Now, by what means to afford the stuff?

There is a way, friends and compadres. It is so simple as to be scandalous. We can have our bays back, our purple mountains majestic, our waves of grain amber. Americans are a greedy lot. Luck of the draw, what with a once vast terrain of natural riches to plunder. Not that others eschew our greed, we simply top the heap.

Add to that our propensity to blindly stumble in a heedless rush for "growth and progress," and one ends up having to use the word "exponential" to explain the consequences.

Of course, honorable readers of *Wild Earth* don't need a remedial lesson on the impacts of *Homo erectus asphaltus Americanus's* exponential growth upon the fragile Earth. Let us not preach to the proverbial choir.

Let us do this instead:
STOP BREEDING!

Doctor's orders.

Turn me out; let me alone. The Doctor desires to return to his sordid days of wine, women and song. He wants nothing else to do with the ravages of dioxin. The stuff is deadly.

Back to my premise, and it should be yours: We must halt reckless breeding immediately! It is the root of every ecological infirmity— anarchist, neo-liberal, social ecological pap to the contrary. Truth be known, the Doctor despises social ecologists. I wish their mothers had thought twice.

Turn off the smokestacks by inverse demand. Let us cease breeding and have our friendly news anchors announcing the rise in new acres of Wilderness reclaimed! It can be. Ease up on the breeding.

Not sex; breeding.

The Doctor wants you to copulate, but copulate sensibly, sans the fateful consequences of procreation. Copulate, don't populate.

As the song says:

*Don't you worry about your genes,
the family name ain't what it seems.*

*Oh, and trust yourself,
you don't have to replicate yourselves.*

("Love Your Mother, Don't Become One," by the Flying Chiggers)

Why do people like to copulate? Or consume drugs? Alcohol? It is a subject that eludes even the elevated IQs of America's wisest wonks. But the Doctor understands: these things are fun. Forget health ramifications

or sociological statistics.

Let us move to solutions. Here's the Doctor's prescription: we should pay folks to have fun.

With deference to civil rights, something the Doctor ardently defends at all costs, it is obvious that forcing people into doing what is right is a prescription for failure. You can't make people smart. Or conscientious, or diligent. But they can be encouraged. Through sheer pleasure. If people are going to get loaded and become carnally familiar, then let's pay them to do it right.

Yes, avid readers, the Dr. is recommending that anyone of any race, of any status, of any IQ, of any political ideological bent, can be economically tantalized into controlling their own genetic outflow. That means you.

Under the Doctor's plan, any American who willingly refrains from replication will receive remuneration. The dispossessed and disowned will take an attractive share, allowing them some semblance of dignity. As for the rich, encourage them to cull their numbers through tax incentives and reverse tax incentives. Their accountants will praise the plan. Jobs!

The religious right (as opposed to the religious wrong?) are having a difficult time reading any further. Sounds like Babylon by Bus, eh? Watch out for tumbling pillars of salt!

Yet, the goal is not to corrupt our nation. The nation is already corrupt. The goal is to reward people for being in tune with the natural rhythms of our planet. As our human population slowly

declines, every environmental crisis will dissipate in direct proportion. All we have in our way is our warped attitude about what humanity is. Call E.O. Wilson if you're still confused.

It is time for those with active brain stems to openly decry our profligate tendency to reproduce in dangerous degree. It is time for the biocentric bevy to refocus, away from the fragmented view of isolated habitat destruction and toward the underlying cause of all biological imperilment. That underlying cause is too many of us.

To those of you who take issue with the Doctor's Final Report, have pity on your own souls. Denial is a mean and pernicious thing. Alcoholics rarely concede that the wagon is dragging them along hard ground. Trust the Dr. on that one.

But denial is exactly what the despoilers of our green world most cherish about our species. They enjoy our quixotic Forest Service appeals, petitions for Critical Habitat, and support for the latest wimpy bill on the Hill. We define the skirmish; they define the outcome.

Open wide and take the medicine. If you haven't replicated, consider not doing so. If you are compelled to breed, limit to one. As Abbey said: Growth for the sake of growth is the ideology of the cancer cell.

There is no excuse for accidental replication. There is no excuse for more roads, more cars, more malls. Small really is beautiful. Less is best.

This is the Doctor's wake up call. It is a challenge to the Big Ten and all those other well meaning conser-

vation groups dedicated to preserving shards of Nature. It is time for you to dispense free condoms to your members, discounts on vasectomies with every membership renewal. It is time for you to realize that the decline of songbirds is directly related to growth in the human population. Time for you to realize that the Brazilian rain forest is not spontaneously combusting. That clearcuts are not pattern baldness.

It has been real. The Doctor says thank you to the good souls who graciously found their way to his PO Box. It is nice to be loved.

But it is even nicer to find oneself stretched comfortably on a white sandy beach, where the sun feels like warm butter, and the cerulean sea is lapping at one's toes. Nearby is a tiny palm-thatched bar, fully stocked with Kentucky's finest sour-mash whiskey. Long live corn! Long live the Wild! And in the immortal words of that marvelous sage, Les. U Knight, **LIVE LONG AND DIE OUT!**

Dr. Dioxin

[Note: This piece, allegedly the final report of Dr. Dioxin, was found on the porch of the WE office in Richmond, VT. As it varies with the Doctor's usual poignant prose in places, we cannot guarantee that this is the genuine article. Thus, it appears as a letter to the readers. However, the overall tone is quite in keeping with the Doctor's general (cynical) outlook. Recent efforts to contact Dr. Dioxin have failed. We can only hope the beach he has found is free of tetrachlorodibenzo-dioxin.]

GUNS NO SUBSTITUTE FOR PREDATORS

I completely agree with Tom Ribe ("Human Fear Diminishes Biological Diversity in Rocky Mountain Forests," Winter 1993/94) in his assertions that fire suppression and predator control efforts have devastating effects on many ecosystems in western North America. He seems to imply, however, that hunting can be effectively used in "managing" wildlife as a substitute for extirpated native predators. In fact, this is a common technique used by wildlife "managers" everywhere. There is a problem with this sort of "management."

Predators normally take the easiest, most available prey (i.e., the weak, sick, elderly, injured, very young, etc.). In doing so, they cull the herd, leaving the strongest and most fit individuals to

reproduce and pass their genetic material on to successive generations. This is known as natural selection and is the prime mechanism of evolution.

Modern human hunters, on the other hand, typically seek out and take the largest, strongest, and healthiest members of a population, leaving the weak, sick, etc. to reproduce. This is the polar opposite of natural selection.

While I do not oppose hunting per se, I think hunters need to be educated as to the effect their actions have. If the bulk of hunters changed their habits, then hunting could possibly be used as an effective "management" tool until healthy predator populations are reestablished.

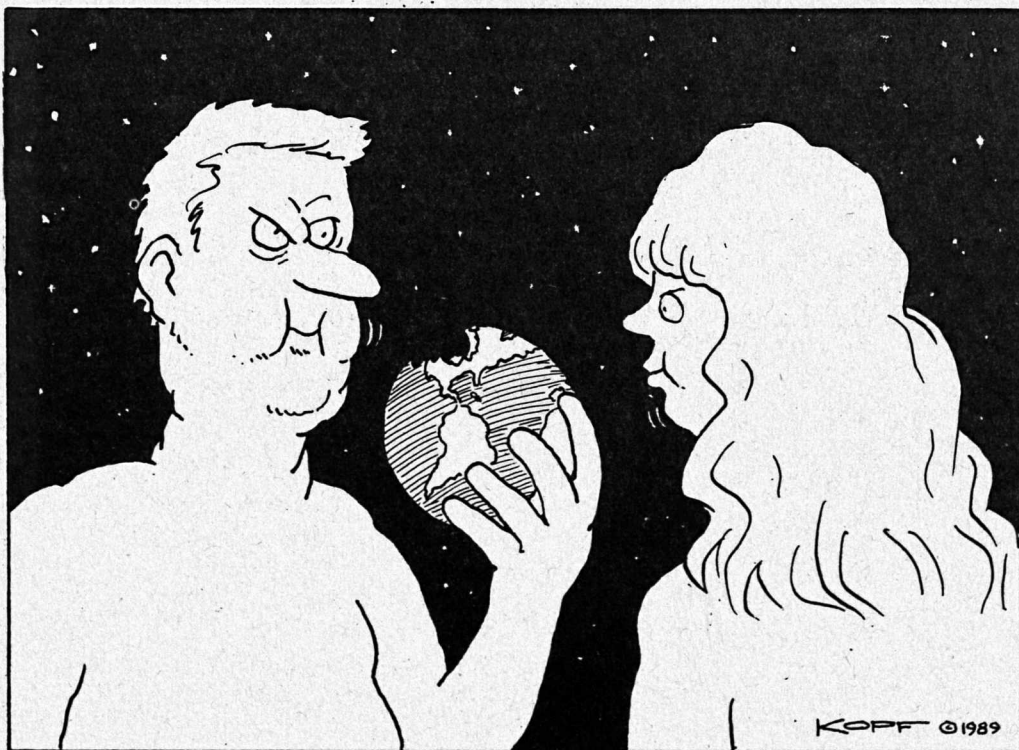
Gary Schiffmiller, 924 Osage Ave., Santa Fe, NM 87505

FLAWS FOUND

According to the article by R. Willis Flowers ("Endangered Invertebrates and How to Worry About Them," Winter 1993/94), the American Burying Beetle (*Necrophorus americanus*) "...has suffered a drastic decline and is now found only in a small area on the Oklahoma-Nebraska border...". It must be a small area indeed, as Oklahoma and Nebraska share no border. Also, the article refers to Table 1 and Table 2, but no tables are shown.

Gary Schiffmiller

Editor's apology: We erred and we apologize. Much of the information in the missing tables is also in the text, but readers who want the information in table form can write us for Tables 1 and 2. As for Oklahoma's and Nebraska's failure to share a border, blame Kansas. —JD



PROPOSED CORRIDOR H THREATENS CENTRAL APPALACHIANS

Corridor H is a proposed federal four-lane highway connecting I-79 west of Elkins, West Virginia with I-66 and I-81 in Virginia. The chosen route, "Scheme D5," would bulldoze through large wetlands and the Corricks Ford Civil War battlefield near Parsons, WV. Corridor H would parallel or repeatedly cross Lost River and disturb many trout streams including Shavers Fork, Duck Run, and Waite's Run.

Hanging Rocks and many other scenic points fall within the 2000 foot range of the proposed corridor. Impact to ground water would be likely, as many springs and caverns pervade the Route 55 area east of Baker. Near Scherr, Corridor H comes within half a mile of the Greenland Gap nature preserve. The nearby mountaintop harbors much wildlife, including Black Bear.

The highway would rip through both the George Washington and Monongahela National Forests. Most West Virginia counties have no planning and zoning laws, no industrial siting laws, and weak conservation easement laws. Residential development rapidly follows a four-lane highway, creating a need for yet more roads.

The West Virginia Division of Highways selected Scheme D5 from a number of options. More hearings are scheduled this spring.

West Virginia Commissioner Fred Van Kirk said the highway would benefit "coal, timber and limestone" shipping. Its most visible lobbies have been the poultry industry around Moorefield and real estate interests around Elkins and Canaan Valley. Out of state trucking interests seeking to get through West Virginia faster are believed to be pushing for Corridor H.

Congress has authorized, but not yet appropriated funds for the road. The highway division wants to start building late in 1995, but next year is an election year and politicians are not bragging much about this destructive billion dollar highway—because so many people are beginning to question it.

Corridor H Alternatives supports an Improved Road Alternative that includes widening pavement, adding passing lanes and straightening some curves in existing roads. This idea has been suggested by agencies like EPA and Fish and Wildlife Service and the National Advisory Council on Historic Preservation.

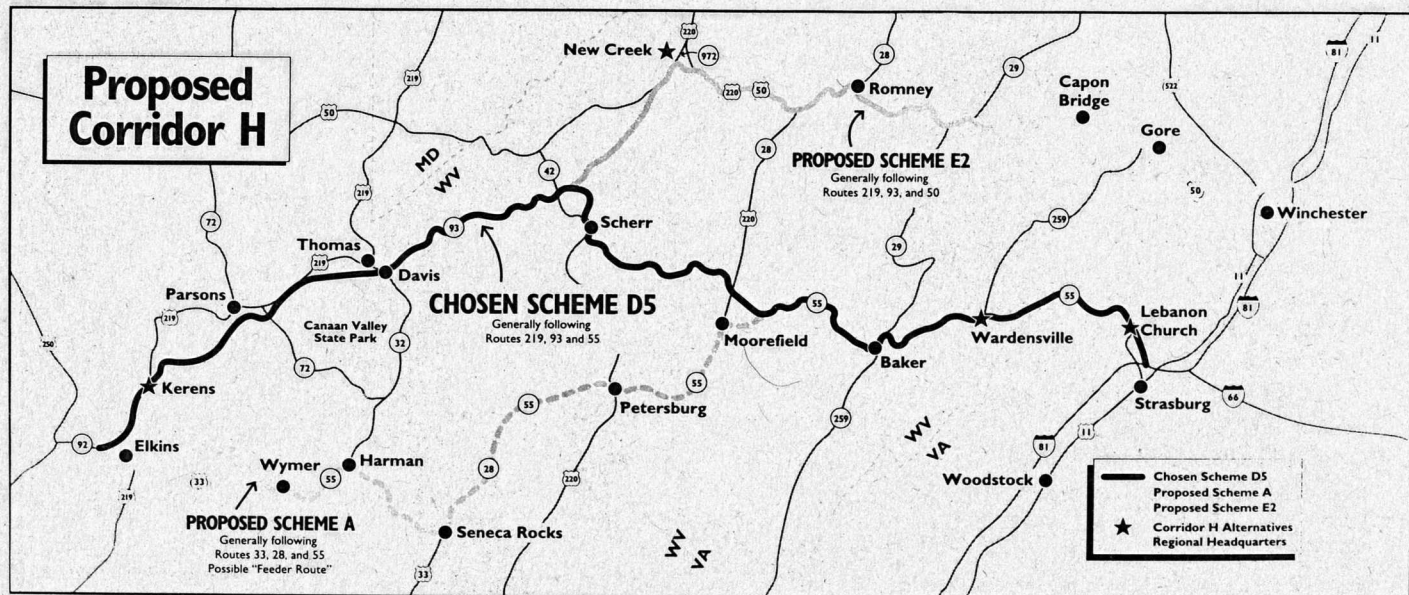
What You Can Do

Write as many letters as you can. If you don't like the answer you get, write the same official with new information. Write anyone with influence in the decision-making process. Get people you know from outside the region with some stake in the area (childhood home, vacation here, etc.) to write about proposed Corridor H—letting our elected officials know that even people from outside care about our area.

A "letter to the editor" is the individual's most powerful tool to express opinions in a public forum. Elected officials as well as ordinary people read "letters to the editor" to keep an eye on public opinion.

West Virginia political officials:

- Governor Gaston Caperton, Governor's Office, State Capitol, Charleston, WV 25305
- Charles Miller, Secretary, WV DOT, State Capitol Bldg. 5, 1900 Kanawha Blvd. E., Charleston, WV 25305-0430
- Sen. Robert Byrd and Sen. Jay Rockefeller, US Senate, Washington, DC 20510
- Rep. Bob Wise, US House of Representatives, Washington, DC 20515



Virginia political officials:

- Governor George V. Allen, Governor's Office, Third Floor, POB 1475, The State Capitol, Richmond, VA 23212
- Sen. John W. Warner and Sen. Charles Robb, US Senate, Washington, DC 20510
- Rep. Frank Wolf, US House of Representatives, Washington, DC 20515

Federal political officials:

- President William Clinton, The White House, 1600 Pennsylvania Ave., NW, Washington, DC 20500
- Vice-President Albert Gore, The Old Executive Office Building, Washington, DC 20501
- Mr. Federico Peña, Secretary, US Dept. of Transportation, Nassif Building, 400 7th St. SW, Washington, DC 20235

Corridor H Alternatives is a non-profit citizens group whose purpose is "to promote transportation systems which preserve and enhance the quality of life, the natural environment, local businesses, and community cohesion, local history and culture in the Potomac Highlands and Shenandoah Valley of West Virginia and Virginia." The group opposes the four-lane Corridor H truck route. Contact Corridor H Alternatives—Central West Virginia Regional Office, Terry Miller, POB 11, Kerens, WV 26276, 304-636-4522.

MT. BLUE BLUES: Logging Continues in Maine Park

A tower among her neighbors, Mt. Blue stands 3187 feet high in the midst of the Spruce Mountain Range. Here above Webb Lake lies 5000 acre Mt. Blue State Park. The State of Maine received the park from the Department of Agriculture (USDA) in 1939. The state then "gave" the management of the park to the town of Weld. The town still receives thousands of dollars each year for the lost property taxes from the park. The USDA deeded the same land to the state in 1955, further confusing the situation.

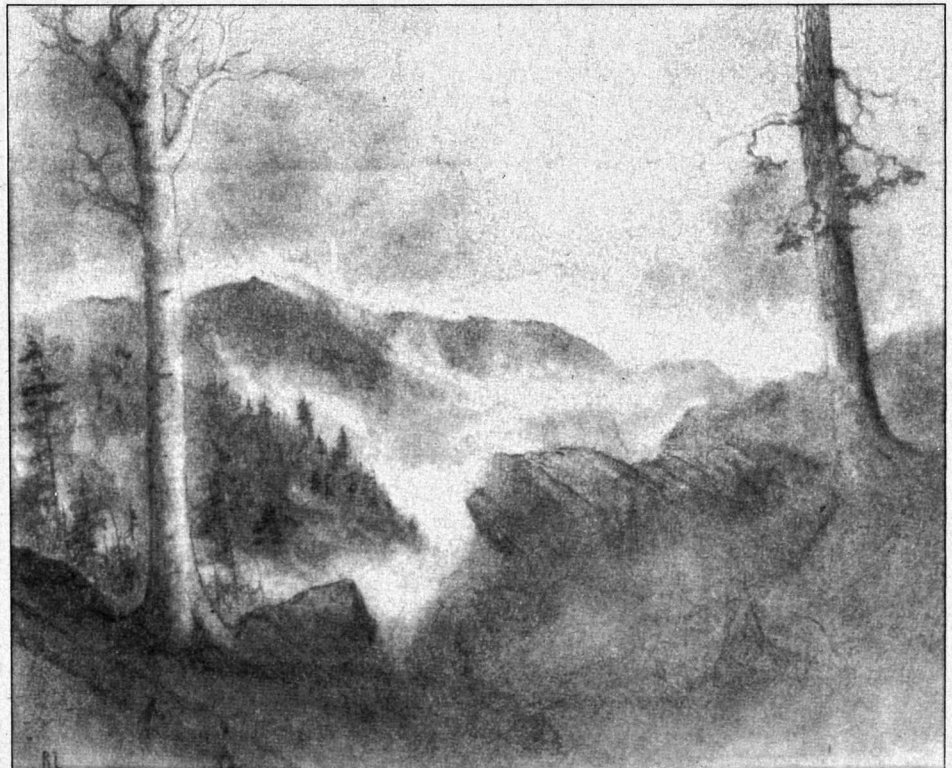
In 1966, the state wanted to acquire beachfront property on Webb Lake for recreational purposes. The sought-after land was then owned by a timber company, Timberlands Inc. In a questionable exchange, the state received 17 acres of lakefront wetlands, and Timberlands got 1160 acres of stumpage rights in Mt. Blue State Park.

The deed mandated light and periodic cutting over a 30 year period within 20% of the park. Instead, Timberlands cut 5995 cords between 1967 and 1972, then ignored the lease until the 1990s. In 1991, a timber

harvest agreement was drawn up calling for cutting 10,824 cords of wood.

The forest felling in Mt. Blue State Park is particularly galling given the lack of protected land in the state. Maine's land base has less than five percent in public holdings. The "public land" is further split between federal land (White Mountain National Forest, Acadia National Park, wildlife refuges, and military reservations) and state land (Maine Public Land Reserve Areas, the Allagash Wilderness Waterway, and Maine State Parks and Recreation Areas.) The "Reserves" hold far more land than the "Parks."

The Mt. Blue Coalition, with about a hundred citizens of all backgrounds, has used many tactics to stop the cut in Mt. Blue State Park. Civil disobedience leading to 35 arrests awakened the public not only to disastrous forest management on public lands, but also to human rights violations of people detained in jail. (All charges were later dismissed.) The Mt. Blue issue was covered by every major media source in Maine, as well as by *USA Today* and *The Boston Globe*. Numerous meetings have been held with John Stowell, vice-president of Timberlands, as well as the director of the Bureau of Parks and Recreation, the commissioner of the Department of Conser-



vation, and Maine's Attorney General.

Due to melting snow and thickening mud, Timberlands pulled out of the park in March 1993. Left behind was a ruined landscape. Timberlands' verbal promises, the lease, and state law were all violated. The state sent out foresters to review the cut. An independent forester who also reviewed the cut agreed that the destruction by Timberlands was unacceptable, but is afraid to get involved due to possible professional backlash.

In its review of the 1992 cutting, the State of Maine found Timberlands violated the agreement in every area. Accordingly, Timberlands paid the \$85 fine to the state. Under public pressure, the state has since offered three deals to Timberlands concerning the remaining stumpage rights:

- an outright buy-out of the remaining deed (about \$48,000);
- a land exchange of the original 17 acres, with conservation easement;
- a new state land purchase, with tax breaks for Timberlands, in exchange for the remaining deed.

Timberlands has refused each offer and made a counter-offer—\$150,000 cash, the pricetag of the original, uncut stumpage rights. Facing gridlock, the state is again willing to accept the deed and current management agreement.

On 28 December 1993, Timberlands once again entered Mt. Blue State Park. Even with deals on the table, Maine officials have allowed construction of new roads to areas containing some of the park's last White Pine. In last year's final assessment, the state requested the removal of one of the skidder operators due to blatant timber harvest violations. Not only did Timberlands refuse to comply, they assigned this operator to possibly the most sensitive cut in the park which parallels East Brook.

What you can do: Come visit Mt. Blue State Park, which was recently listed as one of the top cross-country ski areas in the Northeast. Write to Maine's newspapers and political officials. For more information contact the Mount Blue Coalition c/o Natalie Springuel, 14 Clark Ave #2, Brattleboro, VT 05301.

BLF PETITIONS TO PROTECT DAKOTA SKIPPER BUTTERFLY

On 15 January 1994, the Biodiversity Legal Foundation petitioned the United States Fish and Wildlife Service (FWS) to list the Dakota Skipper Butterfly (*Hesperia dacotae*) as a Threatened species in the United States. The Dakota Skipper is biologically threatened due to destruction of its mid-grass prairie habitat. Dakota Skipper populations are now confined to small, isolated locations. The FWS has 90 days in which to issue a preliminary finding as to the merit of the petition.

The Dakota Skipper Butterfly historically flourished in wet prairies locally in Manitoba, North Dakota, South Dakota, Minnesota, Iowa and Illinois. It apparently has been extirpated from Iowa and Illinois and survives only in small patches of habitat across the other three states. The Dakota Skipper's habitat has largely been destroyed by agriculture and other human encroachments. Live-stock grazing has rendered much of the prairie uninhabitable for the Dakota Skipper. In the wake of agriculture, non-native plant species frequently invade skipper habitat, and spraying to remove these aliens destroys nectar sources key to the butterfly's survival. Isolation of its remaining patches of habitat and marginal population sizes make the skipper vulnerable to loss of genetic variation.

Many other species that share the skipper's prairie habitat are also showing population losses. These species would also benefit from the federal listing of the Dakota Skipper. The federally listed Western Prairie Fringed Orchid and the Regal Fritillary Butterfly, an ESA candidate species, frequently share habitat with the Dakota Skipper.

BLF hopes its petition will bring more attention to the plight not only of the Dakota Skipper, but of the prairie ecosystems key to its survival. The native prairie ecosystems are among the most damaged in North America.

Jasper Carlton, Director, BLF
(POB 18327 Boulder, CO 80308-8327)

COW CONVERGENCES

Three parallel universes are due for a (harmonic?) convergence around the time you read this. The result will dictate the ecological fate of hundreds of millions of acres in the West.

The first and most fundamental universe exists on a broad, rounded plain, generally desiccated and cut by canyons, gullies, and other geologic, anthropogenic and bovinogenic features. This is the public domain, chiefly Bureau of Land Management (BLM) and Forest Service land, grazed by domestic cattle and sheep, and severely injured as a result.

The second world is a draft environmental impact statement (DEIS) shortly to be released by the Department of Interior, outlining steps toward "rangeland reform," in accordance with President Clinton's campaign promises and Interior Secretary Bruce Babbitt's professed priorities.

The third universe combines the aura of a self-help group with traditional Western "states' rights" sentiment. Known as the "Colorado Roundtable," Secretary Babbitt strolled into this universe under tremendous political pressure to back off from universe number two—reform through administrative rule-making.

Let's start at the beginning. President Clinton's first budget proposal was due to include higher grazing fees, along with new regulations governing grazing on public lands. But under pressure from Western rancher-senators, including Colorado's Ben Campbell, Clinton dropped grazing reform from his budget, pledging instead to implement the same goals in another process. This decision downgraded the perceived importance of grazing reform.

Then in May, Secretary Babbitt held a series of high visibility day-long summits throughout the West to host panels on grazing policy and to listen to the public. The meetings were dominated by ranchers. An estimated 20-25% of Colorado's public lands' ranchers attended Colorado's summit—staged on a weekday in conservative Grand Junc-

tion, at least five hours away from three-quarters of the state's population. In contrast, an estimated 0.001-0.002 percent of the non-ranching public attended.

Following these hearings in September, Babbitt attempted to change grazing regulations by secretarial order. In response, Western Democratic senators joined almost all their Republican colleagues in voting for a moratorium on change in grazing and regulation fees (supporting the *status quo*). Only three Westerners (all Democrats) and two Republicans voted *against* the moratorium (and *for* grazing reform): Patty Murray (D-WA), Daniel Akaka (D-HI), Barbara Boxer (D-CA), James Jeffords (R-VT), and William Cohen (R-ME).

However, the House of Representatives, which has supported increasing grazing fees the past several years, did not vote to shut down reforms. In a subsequent conference committee, representatives of the two chambers reached a compromise limiting the size of a grazing fee increase, and limiting changes in on-the-ground management of grazing. A few important elements of reform were retained, however, including provisions allowing the federal government to file applications with the state to own water flowing on federal land.

That compromise then went back to the full Senate and House of Representatives for approval. The House voted for it, but Western senators attacked the agreement as "a statutory basis to steal water," mounted a filibuster and killed it. Although this left the door open for Babbitt to proceed with his original stronger initiative, the rancher-senators probably believed that any administrative order could be delayed in court on procedural grounds (as violating NEPA or other statutes), whereas a Congressional act would sustain no grounds for judicial delay (since only constitutional issues would be sufficient to overturn a new law).

Whatever the Senators' reasoning, Congress had failed to act, so Babbitt's people began preparing an environmental impact statement. But then, ten Western Republican members of the House

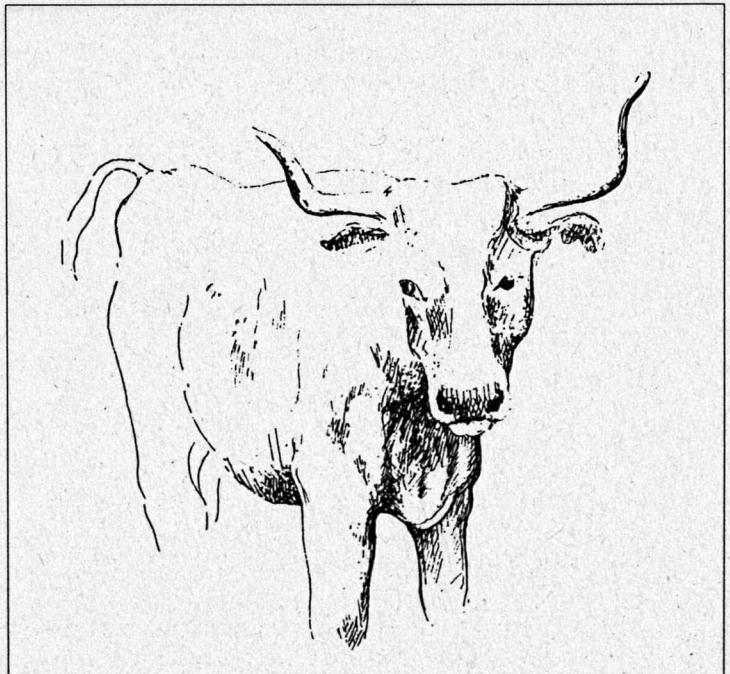
of Representatives wrote President Clinton, pledging to reverse their support for the North American Free Trade Agreement unless Babbitt halted his reforms. Although the President did not publicly respond, as NAFTA went to a vote, Babbitt announced yet another twist to reform: a series of eight weekly meetings he would attend in Colorado with a select group of ranchers and environmentalists to work out an outside-the-Beltway solution.

The invitation to these meetings came from Colorado Governor Roy Romer, who had grown up shooting Coyotes on his family ranch, and who had more recently criticized the House-Senate compromise (the one that got filibustered) as theft of Colorado's water. Romer allowed Reeves Brown, vice-president of the Colorado Cattlemen's Association, to screen the participants.

The initial invitees to these meetings, which became known as the "Colorado Roundtable," heralded from two camps. The first, as mentioned in the last issue of *Wild Earth*, were representatives of the Gunnison County Stockgrowers' Association (GCSA) and the High Country Citizens' Alliance (HCAA). GCSA and HCAA had jointly proposed a national model for grazing "reform," which included strict limits on increases in grazing fees and control of grazing fee receipts by locally appointed committees.

Now enter the third cosmos: the second camp from which the Governor's Roundtable participants were cho-

That convicted violators of federal laws can retain their permits is a sad commentary on the present situation.



sen, and from which the operating style was apparently intended to be drawn, was an "I'm Ok; You're Ok"-type group known as the Colorado Resource Roundtable. This roundtable's primary purpose has been to "build trust among the individuals attending, and to increase mutual understanding of 'why we are what we are, why we do what we do, and how we view the world.'" The participants, who include ranchers and "environmental group activists," deliberately eschewed creating a "negotiating session" atmosphere, in favor of a consensus-based approach toward grazing issues. The Colorado Resource Roundtable typically spends the first half of each full day's meeting on personal introductions of the participants, as a means of building trust.

Fortunately, the National Wildlife Federation, which has taken stronger positions on grazing than have most of the large national groups, demanded a seat at the Colorado Roundtable. To provide credibility to the process, Governor Romer admitted both NWF and the Sierra Club, and those groups prevented the Governor's Roundtable from becoming a balm for the soul but a bane for the land. Although the HCCA/GCSA proposal formed the basis for many of the discussions, consensus on many issues was avoided.

In the mean time, the DEIS on grazing is due out sometime in early spring. It is unclear what elements, if any, from the Colorado Roundtable meetings will be in it. The DEIS will probably examine several main alternatives: A no-action alternative, which would preserve the status quo; a "production" alternative, which would liberalize grazing regulations; a "suitability" alternative, which would be fairly similar to Babbitt's original proposal.

Following is some informed speculation on likely elements of the preferred alternative:

- require suspension of grazing permits to convicted violators of federal and state environmental laws (not called for in current regulations);
- allow foreign corporations to lease Forest Service land, as they currently do BLM land;
- extend beyond the current one year period the ability of ranchers to rest the land (not graze it) without losing their permit;
- instruct BLM to pursue ownership of unclaimed water on public land through the state water legal systems;
- allow non-ranchers to be "affected interests" on Forest Service grazing allotments, as allowed on BLM allotments;
- change grazing advisory boards, which currently spend part of the grazing fee receipts (on such uses as preda-

tor killings and ranching brochures), to "ecosystem boards," open to non-ranchers as well.

Altogether, these are fairly tepid changes, and by the opposition they have engendered, indicate the extent to which our public lands are currently dominated by ranching interests. That convicted violators of federal laws can retain their permits is a sad commentary on the present situation. It is no wonder that many ranchers believe, and some assert in court (in spite of a long judicial history to the contrary), that they own public lands.

Babbitt's odyssey of "reform" is really an attempt to assert public ownership, and that, not the specific changes he proposes, is what infuriates ranchers. Ranching groups called for Babbitt's removal. What they got instead, with the active support of senators Ben Campbell and Malcolm Wallop, was the firing of BLM director Jim Baca.

Shortly before his departure, Baca had sent the entire BLM workforce a message that "no BLM employee should be ostracized for criticizing the status quo or, for that matter, for taking issue with proposed changes." He highlighted a federal report indicating that a quarter of government whistleblowers reported reprisals; a quarter of those reprisals were in the form of transfers to different jobs. Soon after, Baca himself was offered a transfer to another Interior Department job. He refused and resigned. Babbitt stated that Baca had been asked to leave BLM because of "different approaches to management style and consensus building."

Mike Dombeck, a former top aide to Bush Administration BLM Director Cy Jamison, has been named as Acting Director in Baca's stead. It is likely that Dombeck will be replaced shortly by Ken Salazar, who resigned the day before Baca did, from Colorado Governor Roy Romer's cabinet, where he served as Director of the Department of Natural Resources.

Salazar is a water lawyer who hails from a ranching family. A savvy politician with a mind sharp and quick as a leghold trap, Salazar sought slight and graduated, if not entirely aesthetic, changes in his labyrinthine and much-criticized department. As Romer's point man on water issues, he has been a strong supporter of the disastrous proposed Animas-La Plata Project [to dam the Animas River in southwest Colorado]. As the top official supervising the state Division of Wildlife, he described State Representative Dorothy Rupert's legislative reform effort of that agency (see next article) as a "grenade" that would destroy his attempts at cooperation and consensus-building with ranchers.

Michael Robinson, Executive Director of Sinapu, P.O. Box 3243, Boulder, CO 80307

Ranching groups called for Babbitt's removal. What they got instead... was the firing of BLM director Jim Baca.

COMPREHENSIVE REFORM PROPOSED FOR COLORADO WILDLIFE AGENCY

Destruction of wildlife habitat on public lands and other federal assaults on Nature are often rationalized on the basis of local and state support. Although the Forest Service's orientation toward logging is only nominally justified by the chorus of local economic boosters, grazing-related land destruction, particularly in institutionally irresolute Interior Department agencies such as the BLM, is entirely premised on local support.

The strategic value of this parochialism goes far beyond propagandizing public lands grazing and similar controversies as "East vs. West" issues. In fact, the coalition beating back grazing reform depends on local, state and federal laws that coordinate grazing related funding, and along the way build institutional networks, which strongly influence national land policies.

Most of these laws relate to the dis-

tribution of water. An important segment of them, however, concern wildlife. In Colorado, outmoded wildlife policies not only contribute to statewide extinctions, but also form part of the ranching network that has traditionally dictated federal land policy.

Two related themes run through Colorado's various wildlife statutes and policies. The oldest holds that various species of wildlife menace agriculture (in particular, ranching), and thus should be exterminated. Dating to 1869, when Colorado was still a territory, bounty laws rewarded the killing of predators. Administered by county governments, the state-funded bounties were later deemed insufficient, so the legislature authorized local bounties and predator control boards with broad (perhaps unconstitutional) powers.

When the federal government first offered predator extermination assistance during the Progressive Era, state statutes were amended to coordinate efficient funding and administration be-

tween federal, state and local entities. A similar set of laws coordinated rodent exterminations, insect control, and crop disease eradication.

The second wildlife-related statutory theme was appended to the first, as wildlife was recognized as a potential "recreational resource," primarily for hunting. Although policy makers eventually switched some predators, such as Mountain Lions, from varmint to big game status, the original ranching influence continued to dictate that "pest" species be controlled at low populations. Moreover, even after Colorado (and other states) emulated the federal Endangered Species Act with a (weak) state corollary, the state's ranching legacy hampered efforts to recover threatened and endangered species.

These various influences contributed in 1992 to the Wildlife Commission's refusal to follow its own regulations and the recommendations of its biologists to end the spring Black Bear hunt, which contributed to high



detail from Pronghorn limited-edition print by Nancy Roy

bear cub mortality. The Commission's anachronistic Black Bear hunting policies were repudiated by Colorado's voters at the polls in November 1992.

But most of the network of anti-wildlife laws, including the bounties, is still on the statute books. Furthermore, the institutional culture of the Colorado Division of Wildlife upholds the old attitudes. Finally, the Colorado Wildlife Commission, the Division of Wildlife's managing board, is still stacked with ranchers: three out of the eight current members, and in the recent past, four out of eight. As a result, anti-wildlife policies remain in full force. Last year, the Division of Wildlife gave the federal Animal Damage Control program \$36,600 to kill bears and Mountain Lions in Colorado.

To deal with the failure of these state agencies to protect imperiled wildlife and overall biodiversity, State Representative Dorothy Rupert, Democrat of Boulder, has introduced the Colorado Wildlife and Biodiversity Protection Act into the Colorado General Assembly. The Act is based on a proposal drafted by Sinapu, Colorado's wolf reintroduction group, which held a series of seven public hearings throughout the state to listen to people's concerns and suggestions about wildlife policy.

Representative Rupert's bill faces a tough hearing in the House Agricultural Committee, and may not pass this year. Nonetheless, it holds tremendous significance as perhaps the first state effort in the United States to apply principles of biological conservation to wildlife management, while at the same time restructuring the institutional mechanisms that hamper true conservation.

The Colorado Wildlife and Biodiversity Protection Act would repeal the state bounties, the predator and rodent control boards, and end the use of state money for predator and rodent control. The bill would make "protecting and restoring biodiversity" official state policy. It provides a legally enforceable definition of "biodiversity" adapted from R. Ed Grumbine's book *Ghost Bears: Exploring The Biodiversity Crisis*. To

reflect this new commitment to the natural world, the Division of Wildlife would be renamed the Division *for* Wildlife.

The Act would also strengthen the state endangered species act by providing for designation of critical habitat. The bill instructs the Division for Wildlife to work through the federal land management processes to represent the Division's mandate to protect biodiversity. As a result, if the bill is enacted, the State of Colorado might sue the Forest Service or BLM to protect critical habitat. Although the state currently has the authority to take such a stance, it never does. The federal government would be hard pressed to justify habitat destruction when faced with resolute and vocal state opposition.

To provide the necessary authority for the Division for Wildlife to fully protect biodiversity, the Division would be given statutory jurisdiction over wild plants and invertebrates. Plants have been under the authority of the Colorado Department of Agriculture. As a result, the Division of Wildlife has never protected or even inventoried disappearing plants, nor has it considered the impacts on plants of its non-native wildlife introductions, such as of Moose in southern Colorado.

To finance these new responsibilities to protect biodiversity, the Act would provide two new funding sources: First, the sale of wildlife license plates; second, the sale of a card that would allow the bearer to tap into the search and rescue fund. Currently, licensed hunters, fishers, motorboat and snowmobile users pay into a search and rescue fund, which is used to reimburse county sheriff departments when such licensees get lost or hurt in the woods. In essence, these people are insured against having to pay for their own rescues, which can get very expensive. By allowing people to directly buy such "insurance" through such a card, the Act would pump money into this fund from people who do not hunt, fish, or drive recreational machines. Money not spent on searches and rescues would go to implementing endangered species recovery plans. Wild-

life managers would then understand that their budgets are somewhat tied to non-extractive users of natural areas.

Finally, the Colorado Wildlife and Biodiversity Protection Act would end the dominance of ranchers over the Colorado Wildlife Commission. Although one agriculturist (rancher or farmer) would be retained on the Commission, as well as one hunter or fisher, new seats would be created for a wildlife educator, a professional ecologist, and a representative of the tourism industry. The current "wildlife organization" slot, occupied now by a real estate developer who belongs to several hunting organizations, would instead be representative of a group dedicated to protecting biodiversity.

In sum, the Colorado Wildlife and Biodiversity Protection Act attempts to address the systemic problems in Colorado's wildlife statutes that stem from Colorado's ranching past. Part of that past was the creation of a "game and fish"-type wildlife agency that was never supposed to transcend utilitarian views of wildlife. Its purview was mainly limited to vertebrate animals, thus precluding opportunities to delve into ecological relationships. The state endangered species act, passed in order to tap into federal endangered species funds, was never designed to protect habitat. The Colorado Wildlife and Biodiversity Protection Act would broaden the agency's responsibilities, and in some cases limit its discretion, to make the State of Colorado an advocate for biodiversity instead of a link in the national chain of ranching hegemony.

Michael Robinson, Sinapu



PROTECTION FOR SAN JUAN GRIZZLIES?

The evidence began mounting several years ago. Today the record of sightings, positive hair specimens, and other signs would be enough to verify the presence of Grizzly Bear almost anywhere else.

Colorado's San Juan Mountains, however, are in the Southwest, where no Grizzly has been "confirmed" since an old female of these mountains was killed by a hunter in 1979. Now, politically gun-shy federal and state wildlife officials insist that only "indisputable" evidence like another dead animal will do.

Among conservationists, the question is not whether Grizzlies occur in the San Juans but what should be done to protect them. In a poll of conservationists familiar with the issue, I found that only one of fifteen (a prominent Arizona biologist) expressed doubt the bears occur. On the matter of protection, however, sharp differing opinions were evident.

The conservationists were asked whether they would favor a seasonal closure to the public of the area where most Grizzly evidence has been found. (In 1992, I and others petitioned the US Forest Service for an emergency closure of some 85,000 acres of remote backcountry. The FS turned down the request.) Five respondents supported such a move, another "leaned toward it," and another (the Arizona biologist) thought that "critical habitat" should be declared if Grizzly presence was certain. Conversely, several conservationists active in the San Juans vigorously opposed a closure, arguing that it would provoke counterproductive local resentment, particularly among outfitters and hunters. They suggested promoting better ecosystem management, especially through the forest planning process.

The two public officials I contacted did not comment on the closure idea. Representative Bill Richardson of northern New Mexico suggested working with the US Fish and Wildlife Service to build a case for Critical Habitat des-

ignation and recovery. Perry Olsen, director of the Colorado Division of Wildlife, did not respond at all.

Before we lose the San Juan Grizzlies, perhaps conservation biology may help reconcile the differing views on what should be done. One sure requirement for population growth is that the bears have a definite "core area" of protection. The good news is that the 250,000 acre area with recurrent evidence of Grizzlies offers the makings of such a protected core. Our studies of the late 1980s clearly demonstrated this. The bad news is that a recovering Grizzly population could tolerate little if any human intrusion, given the high risk that young bears would face from hunters, poachers, and armed sheepherders. For conservationists, the essential question is this: How do we secure that habitat area so the Grizzlies, otherwise doomed to extinction, may begin to regain their rightful place in the Southern Rockies?

Tony Povillitis, Life Net, POB 318, Glorieta, NM 87535



**GRIZZLY DEFENDERS
CHALLENGE ANONYMOUSLY
NAMED PLAN**

In January the Biodiversity Legal Foundation, the Fund for Animals, and the Swan View Coalition informed the US Fish and Wildlife Service (FWS) that they intend to sue the agency because its newly released Grizzly Bear "Recovery" Plan violates the Endangered Species Act (ESA). The Grizzly Bear—listed as a Threatened species in the lower 48 states since 1975—formerly ranged throughout western North America from Alaska south into Mexico. Today, the Grizzly occupies less than 2% of its original range and is represented by only six isolated populations in the lower 48 states. The survival of *Ursus arctos horribilis* continues to be seriously threatened by development, road-building, logging, livestock grazing, and mining.

The "Recovery" Plan, which by law should establish specific criteria and objectives leading to the recovery and delisting of the species, is not a blueprint for recovery, but a prescription for extinction. Unfortunately, inadequacies in recovery plans are common. A recent analysis of recovery plans concluded that "even if population goals were achieved, 60% of the ESA's threatened or endangered vertebrate species would remain in peril, with roughly a 20% probability of extinction within 20 years or 10 generations."

Inadequacies of the Plan include:

- **Establishment of population recovery levels below the population levels previously identified as recovery goals.** For example, in the Northern Continental Divide Ecosystem, the Grizzly Bear recovery goals have gone from 560 in the 1982 recovery plan to 391 under the new plan.
- **Failure to describe specific habitat protection objectives.** The Plan provides no specific criteria to regulate or eliminate adverse impacts, such as development, logging, livestock grazing, and mining. The Plan does not address the extreme problem of road-building in bear habitat. The Plan also fails to require the establishment and protec-

tion of habitat corridors to link existing Grizzly Bear populations.

- **Failure to use the best available scientific evidence in formulating recovery strategies.** The FWS concedes that isolated Grizzly Bear populations can sustain only so much killing at the hands of humans. Yet, inexplicably, the agency has established the number of Grizzlies that can be killed by known human sources at a level at least twice the figure shown by its own internal data to be acceptable. The FWS has been repeatedly advised of this significant error but continues to use an erroneous methodology thereby permitting the overkilling of bears.

FWS's failure to adequately protect Grizzly Bear habitat and to establish recovery (delisting) targets commensurate with the long-term viability of Grizzly populations is typical of the current recovery effort. At stake here is not only the health of these important Grizzly populations, but of their natural ecosystems. Protecting Grizzly Bear habitat would ensure that these ecosystems, including their megafauna, such as Woodland Caribou, Gray Wolves, Wolverines, and Lynx, have a chance to flourish.

Independent wildlife scientists (i.e., those not on the staffs of state or federal fish and wildlife agencies) agree that the Grizzly Bear Recovery Plan is grossly deficient. Recently, 20 conservation biologists, including leading Grizzly Bear experts such as Lance Craighead, Charles Jonkel, and Lee Metzgar, sent a letter to the FWS concluding that the Plan "lacks scientific credibility and will not lead to the recovery of the threatened grizzly bear."

The Biodiversity Legal Foundation is currently suing the US Fish and Wildlife Service to force the reclassification of the Grizzly Bear from Threatened to Endangered status in the Selkirk and Cabinet/Yaak Ecosystems. In 1991, along with the Swan View Coalition and Fund for Animals, BLF stopped Grizzly Bear hunting in Montana.

—Jasper Carlton, Director, BLF,
POB 18327, Boulder, CO 80308-8327

**VANCOUVER ISLAND VISION
PARALLELS WILDLANDS
PROJECT**

The Western Canada Wilderness Committee (WCWC) recently published a proposal entitled *A Conservation Vision for Vancouver Island*. With a land base greater than England and a human population of little over 600,000, British Columbia's Vancouver Island provides a unique opportunity for preserving and restoring wildlands. While WCWC is perhaps more moderate and cautious in its aims, its vision is based primarily on the same conservation biology background as The Wildlands Project (TWP).

Adorning a picturesque photo of the Island's forests is the hopeful slogan "More jobs and more wilderness; it's a realizable dream." This intriguing phrase beckons even the anthropocentric reader to delve deeper into the pages of this publication.

Much of the *Conservation Vision* is filled with concepts for land tenure reform. In BC, multi-nationals own logging "rights" sold to them by the Crown. Ten large companies own over 70% of these "rights." First Nations have generally been left out of the scenario entirely, many of them never having entered into agreements with the government. WCWC wants to return the land to local control, by native and non-native communities alike.

In BC, like the rest of the forested world, multi-nationals are increasing profits, increasing cutting, and increasing unemployment. WCWC wants to increase employment by creating value-added manufacturing, switching to selective logging and "eco-forestry management," and protecting fisheries.

Most important, WCWC wants to protect and restore wildlands on Vancouver Island. Their plans call for "sufficient protected wilderness":

- to preserve biodiversity—the Island's natural heritage of wild plants and animals;
- to sustain ecosystem functions including maintenance of pure water and fish

habitats, stabilization of soils and production of pure drinking water;

- to provide opportunities for recreation and eco-tourism;
- to allow scientists to learn more about how forest ecosystems and species function.

Currently only 10% of Vancouver Island is protected. Not surprisingly, these areas are mostly "rock and ice." Only 4.5% of the old growth and 5.5% of the productive forest lands are included. Out of 170 watersheds over 5000 hectares, only two are currently preserved.

The *Conservation Vision* lists 15 relatively undisturbed but unprotected areas that would serve as core wildlands. These include five regions of old-growth forest enclosed by watershed boundaries—Clayoquot Sound, the Greater Brooks/Kyuquot Region, the Upper Carmanah/Walbran-West Coast Trail Rainforest, the North Coast and the Lower Tsitika. Ten smaller areas, fragmented but still crucial, would gain similar protection.

Vancouver Island can be divided into two large regions: the South Island which contains the lands south of Alberni Inlet, and the North Island. Currently, the Port Alberni Highway divides the Island and fragments animal populations. The South Island has seen the greater amount of development, with only 15% of its original forest left, according to Sierra Club estimates. North

of the Alberni Inlet the damage has not been quite as extensive. All nine of the Island's undeveloped large watersheds are in the North Island region.

WCWC categorizes lands on the Island into five groups:

- 32.5% proposed protected areas
- 50.9% proposed community forest reserve areas
- 10.4 % existing protected areas
- 6.2% intensive, non-forest use areas
- proposed restoration areas

Definitions for each of these areas are still vague at this point. Little is said about the types of activities, the size of human populations or road densities that would be allowed in each of the areas. The clearest example describes the proposed community forest reserve areas.

Principles of forest management in community forest reserves include selection logging, natural regeneration, natural pest control, and sustainable production of old growth quality timber through setting appropriate site-specific annual cut levels and "rotation ages."

Definitions of core reserves, buffer zones, and corridors are included in WCWC's discussion of conservation biology. It remains unclear where these features are in their plan. The core areas as well as major corridors are comprised of proposed protected areas, while buffer zones are to be part of the community forest reserve areas. Since the core areas will not have roads or human infrastructure, current activities in these areas must be examined.

Despite its newness, WCWC's *Conservation Vision* is already providing a direction for wilderness activists concerned about Vancouver Island. In due time its ambiguities will no doubt be clarified. It serves as a solid foundation upon which wildland proponents should expand.

For more information, contact WCWC, 20 Water St., Vancouver, BC V6B 1A4, Canada.

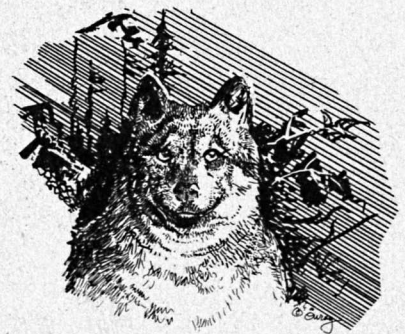
—George Romer, Wild Earth intern

BLF PETITIONS FWS TO LIST ALEXANDER ARCHIPELAGO WOLF

The Biodiversity Legal Foundation and Alaskan biologist Eric Holle on 13 December 1993 petitioned the United States Fish and Wildlife Service (FWS) to list the Alexander Archipelago Wolf as a Threatened species in the United States. The petitioners contend that this small, reproductively isolated population of wolves is biologically threatened due to clearcut logging on the Tongass National Forest, extensive road building, and, to a lesser degree, unregulated hunting and trapping.

The Alexander Archipelago Wolf is a subspecies of the Gray Wolf unique to southeast Alaska. Very little is known about the natural history or population dynamics of this wolf. However, current estimates place the population at less than 1000 individuals.

Logging destroys essential habitat for the wolves' primary prey, the Sitka Black-tailed Deer. Only the broken canopy of old-growth forests provides the combination of adequate browse and protection from deep snow that the deer need for winter survival. Even the Forest Service predicts deer population declines of 50-75% in parts of the Tongass National Forest.



continued next page

Eric Holle warned of the future effects of clearcutting: "The effects may not be immediately apparent, but when the second-growth canopy closes 20 years from now, populations of deer, wolves and other wild-life species will plummet."

Another threat to the Alexander Archipelago Wolf is the lack of an adequate trapping bag limit. In 1992-93, 52% of the Alaska Fish and Game Department's wolf population estimate for Prince of Wales Island and vicinity was taken by trappers.

At stake here is not only the health of the Alexander Archipelago Wolf but also of the temperate rainforest ecosystem of southeast Alaska. Protecting the habitat of its wolf would help ensure that this eco-system's denizens—including River Otter, Queen Charlotte Goshawk, Marten, Prince of Wales Flying Squirrel, and Franklin Spruce Grouse—have a chance to flourish.

The listing of the wolf would increase funding to agencies involved in the recovery program, as well as help protect its essential habitat. The US Fish and Wildlife Service has 90 days to issue a preliminary finding as to the merit of the petition.

—Jasper Carlton, Director, Biodiversity Legal Foundation, POB 18327 Boulder, CO 80308

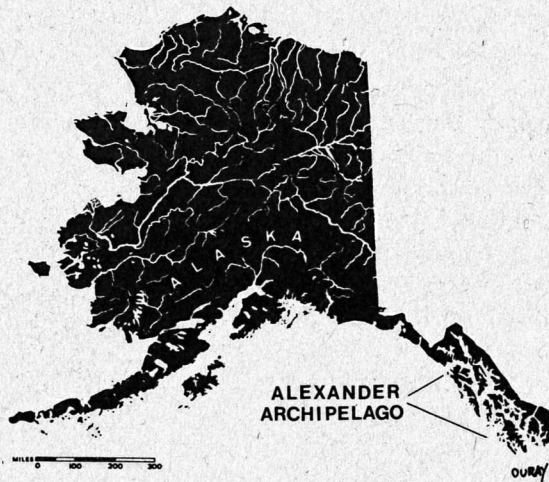


illustration and map by Chuck Ouray

DISTILLER WINS FREEDOM FOR ATLANTIC SALMON

In 1991, an entrepreneurial Icelander named Orri Vigfusson engineered an ingenious buy-out of the North Atlantic Salmon Conservation Organization (NASCO) salmon quotas for the Faeroe Islands. The cost—about \$688,500—is being shared by six salmon-producing countries, private donors, and conservation organizations like the Atlantic Salmon Federation, and should result in substantially increased numbers of salmon returning to rivers in England, Ireland, Scotland, Norway, and Iceland itself.

A distiller and exporter of Icelandic vodka, Vigfusson is also a passionate angler and salmon "farmer." In 1987, at his hatchery on the Laxa River in northeastern Iceland, he micro-tagged 8000 smolts, nurtured them in holding pens to make them more fit for the ocean journey, and then released them into the river.

"Many of the smolts come back a year later as grilse, so we were hoping for a big run two years later," says Vigfusson. "Instead, all we got was a lot of micro-tags from the netters in the Faeroes and Greenland. It made me very mad."

Vigfusson organized an international committee, and spent 18 months shuttling between Iceland and the Faeroes working on a buy-out agreement. He then started negotiations with Greenland's commercial fishermen, and his efforts there, which hold as much significance for North America as they do for Europe, finally came to fruition in August 1993.

The precedent-setting agreement, announced by US Secretary of the Interior Bruce Babbitt and Amos S. Eno, executive director of the National Fish and Wildlife Foundation, will suspend the commercial fishery off Greenland's rich feeding grounds for a minimum of two years. It's estimated that 70-90% of American-born Atlantic Salmon are "harvested"—that is, killed by nets—in this area, and thus never return to their native rivers.

The Greenland buy-out will cost about \$400,000 a year, part of the funds being used to help displaced commercial fishermen start alternative economic activities. "It all makes good economic sense," says Vigfusson, the ambassador of Atlantic Salmon. "The value of one netted salmon is about \$15 for a commercial fisherman, while that same fish is worth up to \$1000, in some cases a lot more [to the catch-and-release sportfishing industry], if it returns to its natal river to spawn."

—David Finkelstein, 300 East 40th, New York, NY 10016

Southern Utah Update

by Leslie Lyon

There's good news and bad news in the southern Utah wilderness fray. First the good. The new Bureau of Land Management (BLM) regime in DC is conceding that the original Utah wilderness inventory was skewed toward extractive interests. Bruce Babbitt has hinted that the Reagan-Bush proposal of 1.9 million acres could be upped to three to five million acres.

Another bright spot is the new Grand Canyon Trust office in St. George. Local activists hope the Trust will help fill the void left when the Southern Utah Wilderness Alliance (SUWA) abandoned their Cedar City office. One of the Trust's first causes is the Army's proposal to launch toxic munitions off a cliff near Zion National Park.

More military madness is brewing in Grand County, where the Pentagon wants to launch missiles from Green River, to White Sands, New Mexico. (Booster rockets would be dropped into Wilderness Study Areas, which would have to be evacuated for the drops.) This boondoggle is being vigorously opposed by enviros in nearby Moab.

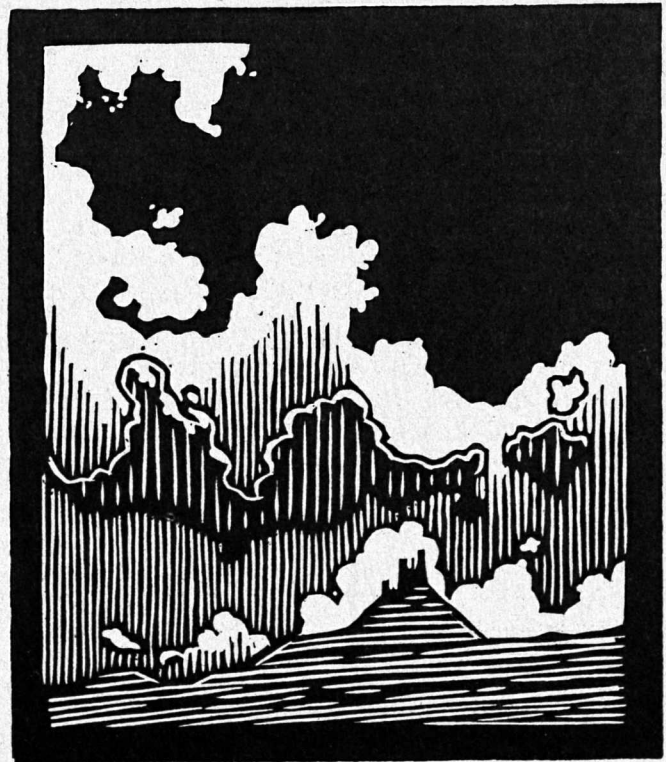
Moab's new pro-ecology city government handily survived a recall vote last fall. Council members angered certain locals by quashing a Book Cliffs highway promoted by their predecessors. The highway would have opened up a vast roadless area teeming with wildlife, creating a poacher's paradise.

The proposed Andalex coal mine has many southern Utahns on edge. Dutch-owned Andalex is casting greedy eyes on the estimated five to seven billion tons of coal underlying the Kaiparowits Plateau. Andalex would strip Kaiparowits of enough coal to fill several triple-trailer semis an hour, 24 hours a day for 15 years. The truck traffic would run over already busy highways to rail yards over 150 miles away. Most or all of the coal would go to Pacific Rim nations.

BLM remains committed to Andalex, but it has dawned on local towns how little this project would benefit us, and how much we have to lose. A showdown is expected when the draft EIS comes out this spring. Local independent activists in Cedar City and Hurricane form the backbone of the opposition to Andalex. SUWA continues to pursue important legal and technical challenges to Andalex.

SUWA is still a burr in the saddles of those who threaten wilderness, even if the seminal Burr Trail battle goes badly for our side. Recent victories include the establishment of standing in grazing issues, and exposing Forest Service and BLM tricks against public participation. SUWA is a party in numerous legal actions against timber sales, predator control, backcountry airports, road building, and dam projects.

The Desert Tortoise controversy in Washington County is drawing to a close. This acrimonious two-year fight pitted developers against wildlife interests, anxious to salvage habitat from the nightmarish growth infecting southwestern Utah.





The topic of water is hotter than ever as the newly-created Friends of the Virgin River alerts the public about dams and diversions threatening this crucial desert ecosystem. Municipalities from Cedar City to Las Vegas, along with the US Fish & Wildlife Service, are fighting over every drop. With California white flight turning to a flood, Washington County Water Conservancy District predicts the county's population (now about 50,000) may rise to 700,000 by the year 2030.

Dams on North Creek and the Fremont River have died well-deserved deaths. The North Creek dam would have inundated an abandoned oil field, contaminating the Virgin and Colorado rivers. Fremont Dam, proposed to generate hydroelectric power upstream of Capitol Reef National Park, was deemed a waste of tax money by the Federal Energy and Regulatory Commission.

Threats to the southern Utah wilderness and wildlife multiply almost too fast to track. Hordes of recreationists are loving the state to death, both in National Parks and the back-

The Tortoise Habitat Conservation Plan (HCP), cobbled together by officials, developers, and wildlife advocates, does designate a fairly large chunk of land—some 60,000 acres—to be managed by BLM ostensibly for the tortoise. Roughly 13,000 acres of state land will be traded for BLM land elsewhere in the county. The federal government is raising \$50 million for several thousand acres of private land by selling BLM land in Nevada.

Developers unleashed by the HCP are rushing to fulfill dreams of a Southwestern megalopolis. No one can explain how we'll water the golf courses and swimming pools for our touted resort lifestyle, except to make vague claims about tapping the Virgin River. BLM has predictably refused to consider the Virgin for Wild and Scenic status.

country. The National Park Service is considering a Yosemite-type shuttle service for Zion Park, which has seen visitation triple in recent years.

The state's trails, back roads, and campgrounds are suffering such heavy usage that even ranchers are crying foul. Jeep jamborees and four wheeler mania make mincemeat of more Utah wildlands every year. The recent San Rafael Swell ORV plan opened a huge territory to four wheelers. On the upside, state game officials now charge so much for out-of-state hunting licenses that fewer hunters are tearing up the mountainsides.

Another relatively new wilderness threat is Hollywood. The eye-catching commercial featuring a Jeep atop a sandstone column inspired other advertisers to capitalize on southern Utah scenery. The area has long been a draw for westerns, but main-

stream movies a la "Thelma & Louise" are also cashing in on our dramatic backdrops. This means more roads, set alterations and litter, which remain long after the film crews return to California.

Utah wildlife lovers were cautiously optimistic when the BLM stopped Animal Damage Control activities due to a lack of environmental assessments. Our joy died, however, when we learned about the "emergency" control loophole. ADC has acted on every emergency request, usually without the BLM's knowledge.

Just when dreamers thought Clinton would put the Forest Service in its place, Dixie National Forest proved again that timber beasts are a law unto themselves. Dixie is pushing a sweeping salvage operation with the rationale that if we don't kill the trees, beetles will. The plan is to cut all the ancient giants favored by beetles, and pray the insects ignore what's left.

The first two salvage projects alone exceed the timber target by 40% without adding seven other salvage sales and six previously planned sales. Not counting salvage sales, Dixie officials plan to cut 17 million board feet a year. This sounds paltry (by Northwest standards) until we remember that Southwest forests seldom grow below an elevation of 8000 feet.

As a major money-losing forest, Dixie will supposedly depart the timber business in 1996. This salvage campaign is clearly a ploy to liquidate Dixie's timber before the axe falls.

Another disturbing aspect of local sales is their giveaway price tag. Local mills are accustomed to buying trees for as little as \$35 per thousand board feet, a fraction of rates in the Northwest. Lured by these bargain basement prices, Boise Cascade and Louisiana Pacific are finding it cheaper to outbid local mills and ship Utah logs north.

Public reaction to the sales has been weak, except for the shrieks from mill owners enraged about their new competition. Most southern Utahns are apathetic Mormons or California transplants who care very little about nature. Friends of the Dixie, a small group started by cabin owners, has joined with SUWA and American Wildlands in a suit challenging one of the salvage sales.

This suit and the few complaints in print are being denounced by other cabin owners, who have swallowed Forest Service propa-

ganda that private forests are doomed unless federal forests are cut. Dixie officials aren't taking the opposition lightly. Nearby residents report that roads around the sales are crawling with tree cops who scrutinize everyone in the area.

In other battles for local hearts and minds, activists suffered a serious setback with the arrival of Janet Fontenot, editor of the area's main newspaper, *Southern Utah Spectrum*. One of Fontenot's first acts was to drop without explanation a pro-ecology column I'd been writing for five years.

Met Johnson, a local cowman turned state representative, has since become the paper's mouthpiece to push the "wise" use agenda. Shrill guest columns by ranchers appear often, even though agriculture provides only one percent of local employment.

The growing popularity of southern Utah among retirees, developers, and tourists make these precarious times for the state's wilderness. Environmental groups may be rethinking their failure to court local support, but the damage inflicted during the enemy's long heyday won't easily be undone. **In the meantime, southern Utah activists urge out-of-state wilderness lovers to ask their representatives to cosponsor H.R. 1500, the Utah Wilderness Bill. (Write US House of Representatives, DC 20515.) WERE**

Leslie Lyon is a longtime Utah wildlife defender and Wild Earth correspondent.



Ecosystem Mismanagement of Cove Forests *on the National Forests of the Southern Appalachians*

by Robert Zahner

In ecosystem management, the latest stratagem of the US Forest Service, the first goal should be the protection of biodiversity. So far, however, business as usual continues on the National Forests, as now obsolete forest plans continue to be implemented with little understanding of ecosystems and biodiversity (McQuillin 1990, Rolston and Coufal 1991). An example of this ignorance is the continued mismanagement of the hardwood cove forests of the Southern Appalachian Mountains. Incredible species diversity is being replaced by even-aged monocultures.

BACKGROUND ON COVE FORESTS

Physiographically and climatically, the Southern Appalachians provide an environment for the convergence of biota from both the north and the south, resulting in communities exceptionally rich in species. These communities reach their best development in cove hardwood forest types (Cain 1943, Braun 1950), where they resemble the mixed mesophytic and northern hardwood ecosystems of the Central and Great Lake states. Under natural conditions, cove hardwoods develop into true all-aged forests composed of a great many tree species in the upper canopy and a richness of mid-story and understory woody and herbaceous species that surpasses all other community types in the region (Ashe 1897, Davis 1930, Cain 1943, Braun 1950, Whittaker 1954, Lorimer 1980, Schafale and Weakley 1990). These forests, therefore, contain one of the most valuable repositories of genetic material in eastern North America.

It is well known that virtually all of the original Appalachian forests were logged of prime timber prior to the establishment of the eastern National Forests (Frothingham 1931, Cain 1943, Pyle 1986). However, they were not "clearcut," as many foresters would like us to believe. Furthermore, most cove forests, even after they were logged, escaped severe damage from wildfires which were extensive throughout the mountains until fire protection was established along with National Forest status. Moist micro-climates of mountain coves do not provide favorable burning conditions.

Horse logging of cove hardwoods in the decades around the turn of the century removed the largest choice sawlog trees of the more valuable commercial species of that era, leaving many trees that were not suitable for timber (Frothingham 1931, Cain 1943). The latter include biologically old trees of all species that were considered "cull" for timber but that were serving important ecosystem functions as cavity, mast, den, and shelter trees for wildlife. Later, as these cull trees died, they served as snags for woodpeckers and raptors, and eventually as fallen, rotting logs for many species of lower plants and invertebrate animals, all of which contribute significantly to the rich diversity of biota in Appalachian cove forests. Equally important, the original logging left hundreds of stems per acre of immature trees of many species, stems that have matured over the century into the present-day uneven-aged cove hardwood communities.

Management policy that forces an artificial, even-aged structure on a natural uneven-aged forest, such as Southern Appalachian cove hardwoods, undermines the integrity of food chains and thus eliminates species.

Thus, in no sense can the analogy be made between the original logging and today's clearcutting, the latter resulting in even-aged stands of limited species diversity. In summary, the original biologically mature forests had developed naturally as mosaics of uneven-aged groups, and, because they were not "clearcut" in the modern sense, they retained a rich species diversity that is today, without man's help, the basic ingredient for restoration. Clearcutting eliminates multiple-canopy structure as well as all cull, immature, and dying trees, and provides for no future standing dead or downed dead trees, all essential characteristics of healthy ecosystems.

Many Appalachian forests logged 60 to 100 years ago have recovered sufficiently to be again classified biologically as maturing biotic communities well on their way to their original condition. When the Southern Appalachian National Forests were established, largely in the 1920s and 30s, the cut-over area was so vast that the only viable technique for restoration was to "let nature heal herself." In cove forests, very limited timber removal occurred, using single tree selection with horse logging, until the era of clearcutting was launched in the 1960s. Today many coves that have not been clearcut are again truly uneven-aged, with four general components of tree structure: (1) very old residuals; (2) somewhat younger, matured individuals that were too small to be logged 60 to 100 years ago; (3) immature trees just now working their way up into canopy gaps; and (4) regeneration varying in age and size from newly germinated seedlings to well established saplings (White 1987). With their multi-layered canopies, these forests have the potential to maintain a rich diversity of species of both plants and animals and the food chains on which they all depend. True ecosystem management can restore these forests to their full biological potential.

BIODIVERSITY IN TODAY'S COVE FORESTS

Observations by naturalists prior to logging, the few remnants of the original cove forests, and the many present-day partially restored forests indicate that up to 20 tree species occupy the upper canopy of a typical undisturbed mountain cove (Braun 1950). These include four species of maples, three of magnolia, two each of basswood, birch and oak, plus American Beech, Tulip Tree, Butternut, Bitternut Hickory, White Ash, Yellow Buckeye, Silverbell, Black Cherry, White Pine and Eastern Hemlock. Up to 10 additional species may occur in the mid-story. Although individuals of many of these cove tree species can be found as components in other forest types, particularly in more northerly habitats, their presence all together in the same community makes cove hardwood forests among the highest in tree diversity in North America. [*Science Ed. note: The only forests with higher within-stand tree species richness in temperate North America are the southern mixed hardwood forests of northern Florida.*]

Diverse as woody plants are in these habitats, the greatest diversity of species occurs in the herb layer, in the associated invertebrate pollinators and herbivores, in the soil and litter

invertebrates, and especially in the amphibians. The richness of herbaceous plants is clearly evident in undisturbed cove forests (Hicks 1980, Schafale and Weakley 1990). Seventy-two species of rare plants are associated with cove forests in the Southern Appalachians (Schafale and Weakley 1990), including *Spiranthes* Orchid, Grape Fern, Wood's Sedge, Mountain Bittercress, *Delphinium*, Twinleaf, Ginseng, Mandarin and Twisted Stalk. More than a hundred other uncommon herbaceous species are associated with these coves, including Bead Lilies, Baneberry, Umbrella-leaf and Black Cohosh. Most of these plants are sensitive to any change in micro-environment away from that of a cool forest interior (Mehroff 1989). Thus loss of species richness, pollination, and food chain connections with insects and other herbivores is great among the herbs with timber management activities that convert cove communities to even-aged forests. I have observed that almost all of these plants, along with their associated fauna, are absent from regenerated even-aged stands, and research has shown that recolonization is extremely slow (Thompson 1980, Duffy and Meier 1992).

PROPOSED BY FOREST PLANS: YELLOW-POPLAR MONOCULTURES

Foresters on numerous field trips have emphasized to me that the creation of even-aged cove forests, comprised of a few commercial species, pre-dominantly Yellow-poplar (*Liriodendron tulipifera*, also known as Tulip Tree), is a goal of timber management on the Southern Appalachian National Forests. Yellow-poplar is a fast-growing tree that reaches financial maturity as early as 40 years and generally no later than 60 years of age (USDA 1983). Forest plans for all of the National Forests in this bioregion call for regulated even-aged timber management.

Under current forest plans, therefore, the Forest Service could attempt to maintain one-sixth of the acreage of Yellow-poplar coves in each of six age classes from 0-10 through 50-60 years of age. With such a distribution of age classes, there is obviously a diversity of tree diameters, stand volumes, and stocking levels which Forest Service managers apparently interpret as meeting the requirements for biological diversity. Such a rationale stems from the now obsolete dictum that biodiversity is achieved by maintaining a patchwork of even-aged stands in all stages of succession up to financial rotation age.

This even-aged goal is simple to achieve silviculturally in the cove forests of the Southern Appalachians. Up to 80% of the tree reproduction in a cove forest regenerated by any even-aged system (clearcutting, shelterwood, seed tree) is Yellow-poplar because seeds of this species are stored for many years in the litter on the forest floor (USDA 1990), and germinate in response to the increased temperature and light. A few mature individuals of this species are invariably present before logging, and have produced sufficient seed over previous years to restock an entire forest. In addition to the Yellow-poplar, a few other weedy species usually round out the canopy in regener-

ated even-aged cove stands; generally sprout stems of Red Maple (*Acer rubrum*) have grown from small stumps of sub-canopy trees cleared in the regeneration cut.

Fully-stocked, even-aged stands of Yellow-poplar up to the financial maturity ages mentioned above support little or no vertical canopy stratification. Lacking significant ground cover and canopy levels below the dominant canopy, immature stands of Yellow-poplar are virtual biological deserts. The Forest Service's preferred rotations are particularly ironic given that Yellow-poplar is one of the longest-lived trees in eastern North America, commonly attaining ages of 300 to 400 years in natural, uneven-aged forest communities.

BIODIVERSITY AND MISMANAGEMENT

The Forest Service and I agree on the *definition* of biological diversity, generally that published by many scientists including Forest Service ecologists. We all agree that biodiversity is the diversity of life, including genetic diversity within species, species diversity within biotic systems, habitat diversity in the landscape, and the diversity of life processes that interact among all these elements (Noss and Harris 1986, Shen 1987, Office of Technology Assessment 1987, Zahner 1990, McMinn 1991, Society of American Foresters 1992, Aplet and Boone 1993). Biodiversity, then is not the output of ecosystems; it is the very fabric of the system, and must be maintained, restored, and protected in true ecosystem management.

In the early 1960s—shortly after the passage of the Multiple Use-Sustained Yield Act, which mandated the Forest Service give equal consideration to all forest values—the agency embraced even-aged management for all forest types in the Southern Appalachians. The forestry profession abandoned fifty years of experience with uneven-aged forest science and management in its zeal to convert the National Forests to a regulated distribution of species and age classes that made simple the production of timber and game. Now a whole generation of forest managers has been trained solely in the principles and economic benefits of even-aged management, without regard to the wholesale losses at all levels of diversity that this policy causes for non-commodity species. Congress again acted in 1976, with the National Forest Management Act, this time with explicit language regarding maintenance of biological diversity.

Yet, all of the forest plans for the Southern Appalachians adopted in the last ten years still lack a well-defined, explicit provision for the protection of biodiversity (Aplet and Boone 1993). Forest Service managers try to rationalize that even-aged forest stands provide for adequate natural biotic diversity. For example, game managers have determined that even-aged timber management is not detrimental to the production of deer, turkey, and grouse, allowing the Forest Service to claim that clearcutting is “beneficial” for some game animals. In fact, the management-created distribution of even-aged classes of forest stands throughout an entire forest is solely for the convenience of record-keeping, inventory, and the production and harvesting of commodity products—timber and

game. Such management of Appalachian cove forests produces little beyond timber crops of a few commercially important tree species, not even the best habitat for game.

Management policy that forces an artificial, even-aged structure on a natural uneven-aged forest, such as Southern Appalachian cove hardwoods, undermines the integrity of food chains and thus eliminates species. Reduction in canopy-level tree species is only the most noticeable loss. All phyla present of both flora and fauna lose species, some in great numbers, with such a shift in the age structure of the tree component (Thompson 1980, Petranka et al. 1992, Duffy and Meier 1992). When the multi-layered canopy is eliminated, microclimate is drastically altered, and only a few species are adapted to survive under the conditions created.

As we have seen, where Yellow-poplar is a minor component of the original community, it becomes the major, often dominant component of the regenerated even-aged stand. Mid-story canopies, eliminated by even-aged conversion, develop only after 30 to 50 years, and with only a small fraction of the original species. Arboreal fauna, including insects, spiders, and birds, are reduced when shelter, food sources, and nesting sites are destroyed by removal of the multi-layered canopy. On the forest floor, populations of all major taxonomic groups of salamanders are adversely affected by conversion, and some species die out completely.

Most cove forests were once interconnected physiographically and climatically up-cove and down-cove in a dendritic pattern on the landscape, providing corridors for genetic exchange among populations of organisms associated with cove ecosystems. Many of these corridors have been lost already due to clearcutting and conversion to even-aged stands. If remaining cove forests are not left to function as uneven-aged natural communities, genetic outcrossing dependent on cove corridors will be seriously impaired, and many organisms with limited mobility may lose their ability to maintain healthy populations (Aplet and Boone 1993).

Even-aged forest management also destroys cove forests' role in maintaining the two broadest levels of diversity: habitat diversity and landscape diversity. To maintain the health of a forested landscape, as for example within a watershed of perhaps 5000 acres in size, it is essential to retain many diverse natural communities. These will vary from streams, riparian edges, lower slopes and coves to mid-slopes, upper slopes and ridges. Each habitat has its own unique composition of plants and animals (species diversity within habitats) which depends on the integrity of adjacent communities as well. Under natural conditions, the transition from one community to the next is a gradual continuum, providing buffer zones essential to the stability of the entire landscape (Odum 1975, Burkey 1989). Even-aged forest management eliminates the continuum, establishing sharp edges that are devastating to forest interior species in adjacent communities (Harris 1984, Wilcove 1988, Aplet and Boone 1993). Such artificially defined forest habitats—really just stands of trees—are analogous to the patch-

work of fields and pastures created in an agricultural landscape, where native biodiversity has been virtually eliminated.

The broadest level of biodiversity, landscape diversity, on a scale of tens to hundreds of square miles, is also threatened by even-aged forest management. Even-aged commercial forests provide little variation from agricultural lands. The National Forests of the Southern Appalachians surround and are surrounded by large areas of disturbed and cultivated landscapes. The present emphasis in Forest Service plans on commodity products from the National Forests, facilitated through road-building and clearcutting, removes from the landscape the primary feature that National Forests can best provide: natural forest communities (Crow 1991).

SOME CANDID RECOMMENDATIONS

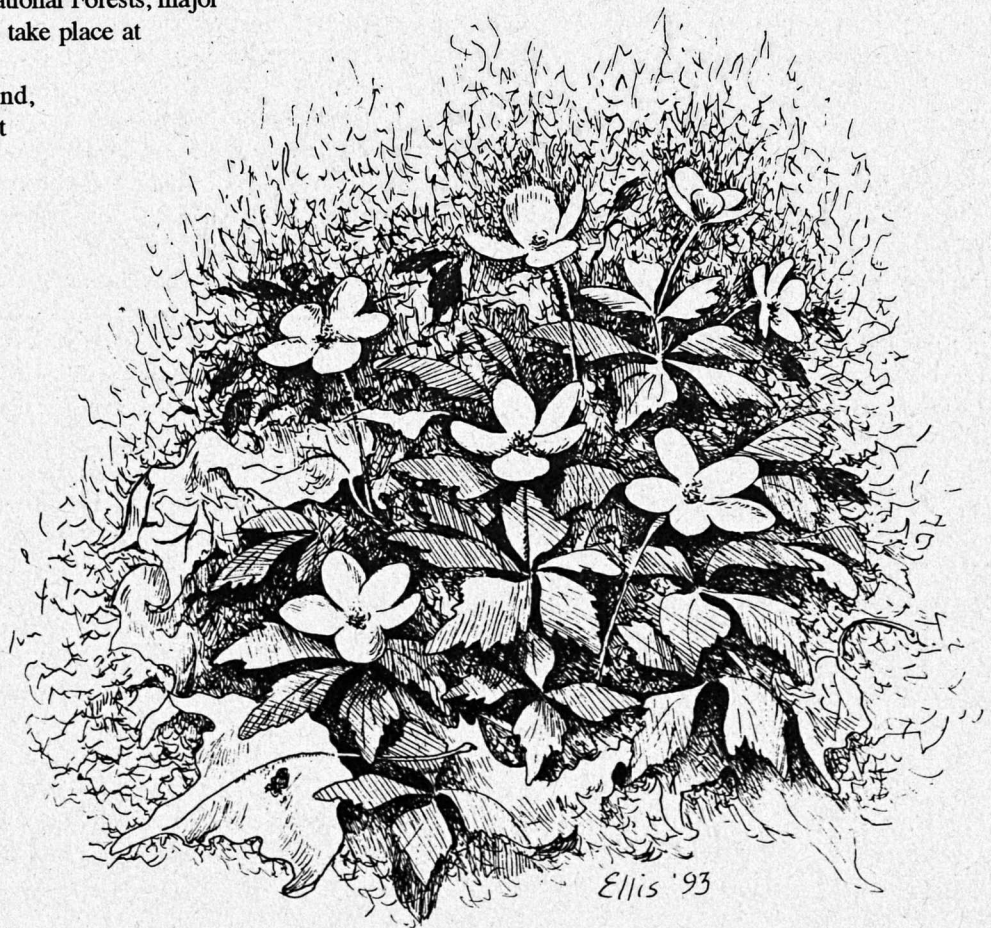
The Forest Service must begin to recognize the *forest*, not just the trees. Presently, forest plans are drafted by timber managers who are trained to see only the trees, planners who are unwilling to recommend any actions that might hamper timber removal (McQuillin 1990, Rolston and Coufal 1991). Back to my opening sentence, the first goal of forest plans must be to protect biodiversity. In order to end ecosystem mismanagement, future forest plans must be prepared by conservation biologists, of whom there are none in today's planning process. The FS's new policy calls for ecosystem management, but if it is to become a reality on our National Forests, major personnel changes will have to take place at the planning level.

Meanwhile, on the ground, what is a manager to do? District rangers say their hands are tied by current forest plans and timber targets. They are awaiting revised plans and reduced targets before they take action to implement "ecosystem management." So it's business as usual, and forest ecosystems in the Southern Appalachians, like the cove hardwood communities described above, are falling to the bulldozer, chainsaw, and high-lead cable skidder. The forest manager is still comfortable with constructing a new road to the top of a ridge overlooking a cove forest, setting up a high-lead skidder, and clearing off the entire slope below. Because even-aged management reigns supreme, his forest plan says that such action provides for diversity. His

only other choice is the "no action" alternative, disdained because it does not accommodate his timber target.

Current forest plans do, however, permit the "no action" alternative. Until plans are revised or rewritten, this is the only ethical choice for "ecosystem management" of unique communities like Appalachian cove forests. I recently proposed this alternative, termed "benign neglect management," for maintaining biodiversity in Southern Appalachian forests suffering oak decline (Zahner 1992). Until there are better guidelines for ecosystem management, letting nature manage herself is the safest choice.

Robert Zahner is a Professor Emeritus from the Forestry Department of Clemson University who helps such Southern Appalachian groups as Western North Carolina Alliance (70 Woodfin Pl. Suite 03, Asheville, NC 28801), Southern Appalachian Biodiversity Project (POB 3141, Asheville, NC 28802), and Chatooga Watershed Coalition (Rt 1 Box 103, Mtn. Rest, SC 29664).



Microhexura montivaga

an elegaic monograph

by Joel M. Harp

How many little-known species will be lost? Indeed, how many have already been lost?

The Spruce-fir Moss Spider, *Microhexura montivaga* (Araneae, Dipluridae), is perhaps the most striking representative of a unique assemblage of spiders associated with the high elevation spruce and fir forests of the southern Blue Ridge province. These now declining forests represent islands of relict boreal forest isolated from the main body of the great boreal forest of what are now Canada and the northern United States since the last glacial retreat. The length of time that these islands of boreal forest have been isolated has resulted in a number of endemics in the spider fauna as well as other taxa. In addition to endemics are rare and disjunct populations of boreal species existing well beyond the southern borders of their primary range.

In 1989, a survey of the spiders of this forest had only begun when it became evident that *M. montivaga* was in a decline matching that of the dominant tree species: Red Spruce, *Picea rubens*, and the endemic Fraser Fir, *Abies fraseri*. Acid rain appears responsible for the decline of the Red Spruce. However, perhaps more significant to the fate of the Spruce-fir Moss Spider is the devastation of Fraser Fir by the balsam wooly adelgid, *Adelges piceae*. This introduced pest may well destroy all mature stands of Fraser Fir in the South and with the Fraser Fir, the Spruce-fir Moss Spider.

Microhexura montivaga is one of the world's smallest tarantulas. The adults are barely more than 3 mm in length. It is found only in moss mats on boulders or logs in the Southern Appalachian mountains above 5300 feet. The size and range of the spider is remarkable in that every other genus in its family, the Dipluridae, contains large and tropical or subtropical species. The Spruce-fir Moss Spider has a very narrow range of environmental tolerances, requiring the high and constant humidity of the moss mats. The moisture and shade provided by the firs is essential. The decline of the trees has resulted in the opening of the canopy. Moss mats have dried out and spider populations have been destroyed as a consequence of forest decline. The species was first discovered in 1923 on Mt. Mitchell. An examination of that site in 1990 failed to uncover a single specimen and the species is now believed extinct on Mt. Mitchell.

A survey of the high elevation forests of Great Smoky Mountains National Park concluded in 1991 found only a single viable population. That population was in a relict stand of Fraser Fir on Mt. LeConte. The fir stand has now declined to such an

extent that the continued survival of the species there is in doubt. A program of captive breeding has been undertaken by the Louisville Zoological Park in Louisville, Kentucky. Although the species is extremely difficult to maintain in captivity, efforts to save the Mt. LeConte population by captive breeding are hopeful. The remainder of the range of the southern spruce-fir forest outside of Great Smoky Mountains National Park was then surveyed under the auspices of the North Carolina Wildlife Resources Commission and the US Fish and Wildlife Service. That study has concluded that only a single robust and viable population remains in North Carolina. Many areas have been so devastated by acid rain and the balsam wooly adelgid that little moss habitat remains to possibly harbor populations of the tiny spider. A few areas, though, do contain seemingly adequate habitat. Roan Mountain, for instance, was carefully searched a number of times but no trace of the Spruce-fir Moss Spider was found. The reason may be that the forests of Roan Mountain were sprayed with lindane in the late 1970s to prevent damage from the adelgid. However, they may never have been there; I found no record of the species having been collected there before the spraying program. Cutting of the spruce-fir forests at the turn of the century may have eliminated the species from other areas within its range. Apparently, if the species is eliminated from an area, it does not return naturally. Most spiders are capable of efficient dispersal, but the extreme

sensitivity of the moss spider to desiccation makes it unlikely to survive even short periods away from a sheltering moss mat.

The species is currently a candidate for listing under the Endangered Species Act. An inventory of spiders of the high elevation forest of the Great Smoky Mountains is being conducted to identify other species affected by forest decline.

The case of the Spruce-fir Moss Spider demonstrates that many of the obscure species we now know to be threatened with extinction gained that recognition largely by accident. I simply happened by chance to undertake a survey of the upper elevation spider fauna as a spare time project. The Mt. Mitchell population had already been lost before I even began my project. How many little-known species will be lost? Indeed, how many have already been lost?

WHAT YOU CAN DO

Send letters of support for the captive breeding program to the Louisville Zoological Park, 1100 Trevilian Way, POB 37250, Louisville, KY 40233. Support reauthorization of a stronger ESA, mandating an ecosystem approach to species conservation.

Joel Harp (1940 Emoriland Blvd., Knoxville, TN 37917) works at Savannah River Ecological Laboratory and studies arachnids in the Southern Appalachians.

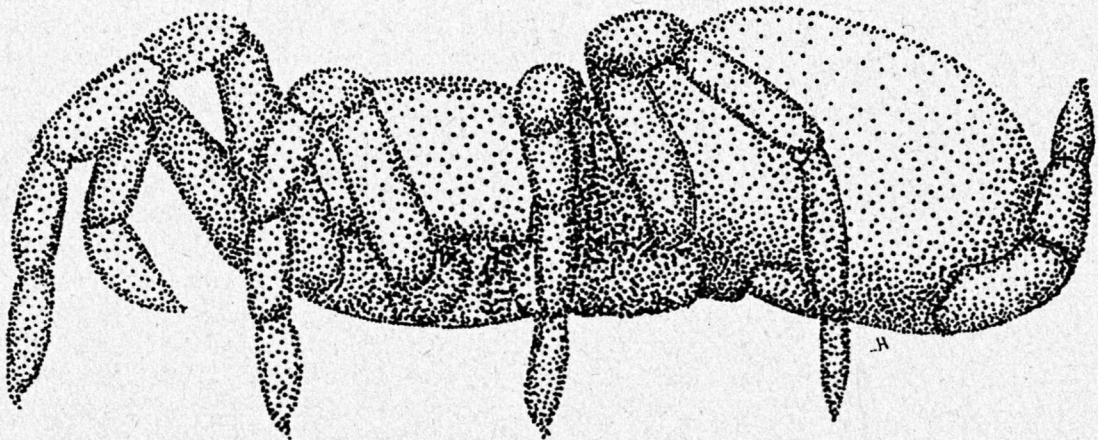


illustration by Joel Harp

Mohawk Park? The Time Is Right!

by Robert T. Leverett

The time was 1735; the place, Massachusetts. The mood was solemn as a deed was being signed. A small remnant of Native Americans left their beloved Deerfield Valley of western Massachusetts forever. Custody of the land passed into the hands of a different culture—a culture blinded with the image of its own importance and insatiably thirsty for material wealth. The stamp of the new culture's value system would soon be felt on the land.

Mohawk Trail State Forest is nestled in the central Berkshires of Massachusetts west of the town of Charlemont. Named after an historic Indian path, Mohawk State Forest occupies a modest 6457 acres. Starting at the confluence of the Cold and Deerfield rivers, the pearl of the Berkshires is rudely split by state Rt. 2, an asphalt intrusion that shatters the tranquility of the deep woods. Mohawk sports a campground, a nature center, an adjacent picnic area, and three hiking trails. The campground provides a pleasant escape for cautious city dwellers. The trails and surrounding ridges provide a haven for those more attuned to nature. However, Mohawk harbors far greater treasures—natural, historic, and cultural—than an ordinary accounting of physical assets would suggest.

HISTORICAL PERSPECTIVE

The original Mohawk-Mahican Indian trail connected the watershed of the Connecticut River with that of the Hudson. Later the British "improved" the trail. Today few places exist where the pre-colonial pathway is discernible. Mohawk Trail State Forest is an exception. Within Mohawk, one can walk a part of the Indian trail not obliterated by asphalt. For a short distance the trail splits into two routes: one takes the high ground and the other runs parallel to the Cold River through exceedingly rough terrain.

Mahicans, Mohawks, Pocumtucks, and members of other tribes all used the trail. Despite its name, the Pocumtucks probably made the greatest use of it. The location of at least one semi-permanent campsite is known; but there are no monuments or museums to commemorate the passing of a rich Native American culture. There are only faint traces of that culture: a place name here, an isolated artifact there, and a precious piece of the trail.

How this state of affairs came to be is well documented. It is a story repeated often in the subjugation of Native Americans by Europeans. Native Americans, with their different view of land ownership, were an enigma to Europeans. Indians were never very numerous, and except in small areas, their simpler lifestyles generally had only minor impacts on the land. Aboriginal property rights meant little to the expansionist Europeans. Wherever they settled, Europeans harbored attitudes toward land ownership and use that led to rapid development and exploitation. With self-proclaimed manifest destiny, the Europeans dismantled the native cultures and changed the face of the land. Places like Mohawk were unceremoniously carved, scraped, and burned.

Obviously, this account is oversimplified. Not all European settlers nor their descendants were exploitive. Many had an abiding love for the land that matched that of Native Americans. Thoreau and other towering figures of the last century take a back seat to no one in their belief in the sacredness of the land. But their counsel has for years gone unheeded.

In spite of past abuses, the land now called Mohawk Trail State Forest is the beneficiary of a more enlightened management. Much of Mohawk has at least partially mended and today

*The original
Mohawk-Mahican
Indian trail connected
the watershed of the
Connecticut River
with that of the
Hudson.*

presents an aesthetically pleasing sight to visitors. Here the story might end but for a little known treasure in the midst of the healing landscape—a treasure that immeasurably enhances Mohawk's ecological, historical, and (for some) spiritual value.

Mohawk and adjacent Savoy State Forest contain the largest acreage of old-growth forest in Massachusetts. The rocky, steep sides of Cold River and Deerfield gorges deterred logging and pasturage, allowing small patches of ancient forest to survive almost intact. On Todd Mountain, the original Indian trail passes near one of these small stands. The north side of the trail is shadowed by ancient oaks and hemlocks that began life when the trail was but a path used by Indians, Colonists, and British soldiers. A few gnarled trees date to an even earlier time, when only indigenous animals and Native Americans trod. This tempting morsel of ancient forest forms a narrow, tortured band that runs along the north side of the Todd-Clark ridge line—a window to a past landscape, where nature was in full dominion. The old-growth area scarcely exceeds ten acres; but it foreshadows a much larger area securely hidden from view along a lesser known branch of the original Indian trail. The latter old-growth area, the Cold River tract, is the closest the state has to pre-settlement forest.

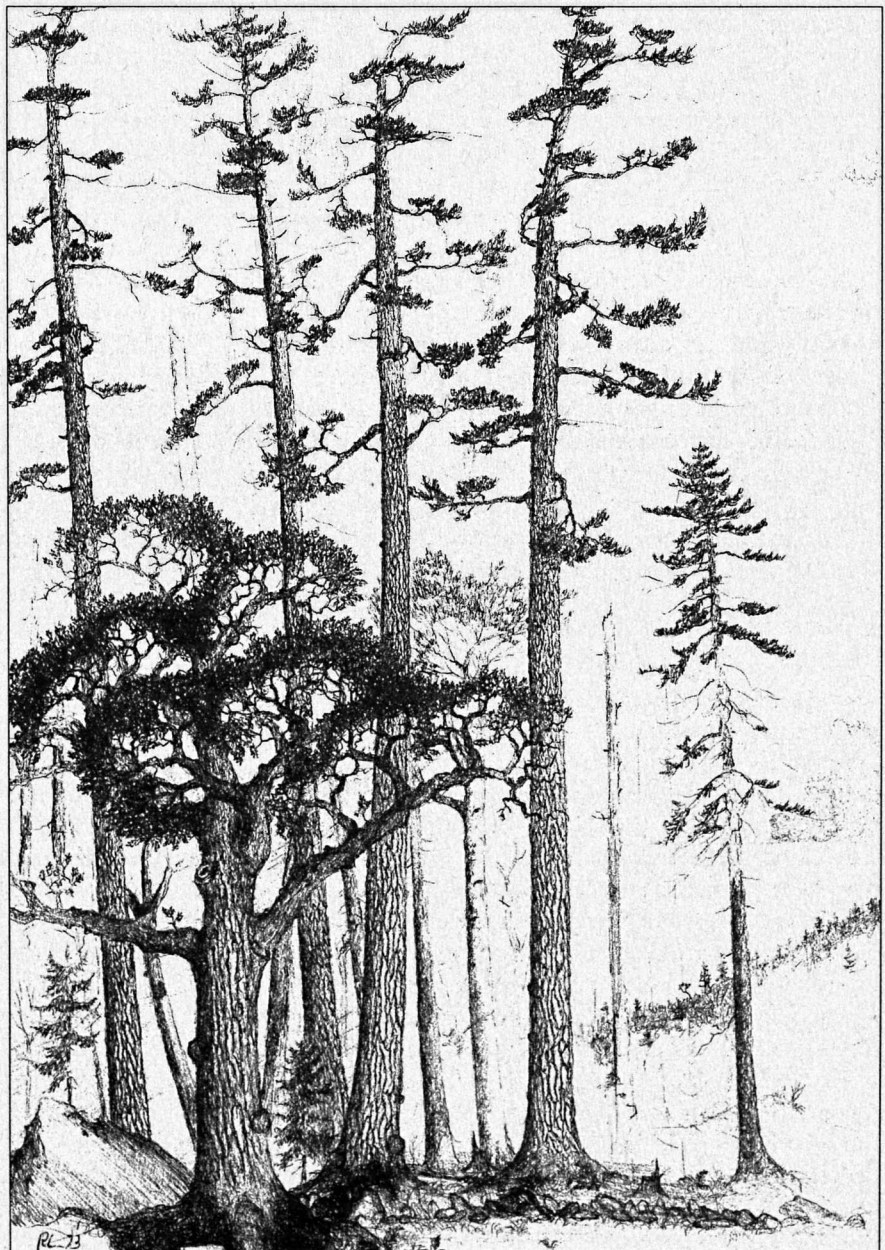
The precise acreage of the Mohawk-Savoy Mountain old growth is open to debate. Estimates have ranged from 150 acres to 2400 for the Cold River tract. The reason for such disparity lies in the conflicting definitions for old growth. However, a recently completed study (in which I participated) conducted for the Massachusetts Natural Heritage and Endangered Species Program by Massachusetts Audubon under the able leadership of Dr. Peter Dunwiddie, inventories about 90% of the prime Mohawk-Savoy old growth. From that study, we can safely conclude that between 175 and 200 acres of Mohawk-Savoy meet the strictest definitional criteria and lie within the confines of an area of about 800 acres of intermittent old-growth characteristics.

The difference between the prime areas and their surroundings is highlighted by the age distribution of their trees. Many in the prime area exceed 300 years. A few surpass 400. The oldest known Black Birch here is over 300 years in age. By contrast, in the surrounding area, mature trees are between 120 and 170 years old with some Eastern Hemlocks and Yellow

Birches exceeding 200. Signs of selective cutting in the larger area are apparent. Yet this larger area is gradually returning to an ancient forest condition.

Mohawk's old-growth stands have performed another service. They have seeded a mature forest in adjacent areas. Here is the home of an unusual collection of superlative trees. The list reads like a Massachusetts Who's Who of the arboreal world. A sample follows.

- Tallest trees measured in Massachusetts: Two White Pines growing in Mohawk top 155 feet. They are the tallest measured in the state and among the loftiest in all New England. Three separate stands in Mohawk have pines exceeding 140 feet. One huge tree measures 13 feet 4 inches in circumference and sends its leaders skyward for 140.5 feet. Pines in



the 125 to 135 foot range, results of benign forest management, are common, exhibiting post-Civil War regeneration. Sadly, though, true old-growth pines like those growing in the Adirondacks are virtually non-existent in Mohawk. The only contenders are a few colonial aged trees growing on steep ridge sides.

- The tallest measured hardwood in Massachusetts: A Sugar Maple at the base of Todd Mountain on the edge of a marginal stand of old growth reaches a surprising 134 feet. A nearby specimen makes 120 feet, and a third Sugar Maple on Cold River in a prime old-growth area measures a solid 121. The latter tree helps to form a canopy that averages 100 or more feet, the litmus test for tall trees in the East.
- Tallest measured Red Maple in Massachusetts: A specimen in an old-growth area reaches 113 feet and probably pushes the limit for the species in Massachusetts.
- Largest Sugar Maple in the state: The behemoth's statistics are: 102 feet in height, 18 feet 3 inches in circumference, and an average crown spread of about 90 feet. Although the champion is old, it does not grow in an old-growth area. It is a boundary tree growing along an old rock wall.
- Tall White Ash: A White Ash in the old growth reaches 125 feet in height, making it the tallest ash measured in the state. Another near the champion Sugar Maple approaches the old-growth ash.
- One hundred foot plus trees are common in Mohawk. Many hemlocks, White Ashes, and Sugar Maples are in the 110 to 115 foot height range. Other standouts include several Red Spruce that approach or exceed 110 feet in height and 7 feet in circumference. One that fell several years ago was over 350 years old by ring count. The oldest tree I've known is (was) a hemlock in the prime old-growth area. It toppled a couple years ago, having lived 425 years.

TIME FOR AN ADJUSTMENT IN STATUS

The foregoing is intended to promote Mohawk's historical significance and botanical treasures, but Mohawk is a combination park and working state forest. Those areas devoted primarily to timber harvesting have been maintained well by the Department of Environmental Management. I make no criticism of their methods. Mohawk has been a model of good forestry and should be recognized as such. We in the environmental movement must not fail to recognize the difference between good forestry and the abominable practices found in many states. However, stumps, skidder marks, slash, roads, and other unavoidable byproducts of logging, even if minor and controlled, are inconsistent with the rich park-like character of much of Mohawk. Commercial forestry operations should remain separate from areas best suited for park, which in the case of Mohawk, include everything except the southeast corner of the forest—a region called the plateau. The areas redesignated as park should be removed from timber management and dedicated to preserving mature forests and to educating visitors on Mohawk's Native American origins and colonial aftermath.

It would be foolish to pretend that Mohawk could be returned to its original condition. Too many hands have changed it, and Mohawk is not wilderness. Given Mohawk's current condition, a blend of nature, history, and culture would be appropriate for the future. The Native American and colonial past could be rekindled to the economic benefit of the surrounding area in ways that combat pressures to drift toward exploitation and motorized recreation.

Such a vision of Mohawk is not without risks. Old growth in Mohawk is currently protected. The recreational areas have not suffered from overuse and are well maintained by the staff of Mohawk Trail State Forest. Why not leave well enough alone? There is a danger of exposing Mohawk to more attention than its modest acreage can handle. However, the pressure to harvest timber from a forest that has matured can be overwhelming, particularly in times of economic downturns. Political administrations are notoriously shortsighted and place conscientious managers of forest resources under enormous pressure to exceed sustainable yields. Timber industry and congressional pressure on the U.S. Forest Service is a prime example. In addition, administrations change and with them come different visions of recreation. Several years ago, one of the most pleasing areas of Mohawk, Stafford Meadow, was being considered for an extension of the camping area and inclusion of tennis courts. Thankfully, cooler, wiser heads prevailed, and Stafford Meadow was preserved as a sanctuary. It will be a prime function of **Friends Of Mohawk Trail State Forest**, an organization in the process of being formed, to guard against such ill-conceived plans.

In closing, I would be remiss if I left the impression that others do not value Mohawk Trail State Forest's natural treasures and the priceless remnant of the original Indian trail. Mohawk's current managers do. In addition, there is a movement afoot in western Massachusetts, spearheaded by Lauren Stevens of Williamstown, to get the National Park Service to recognize the network of historic Indian trails that connected the Berkshire-Taconic region of Massachusetts with the Hudson River Valley of New York. Land in Massachusetts, Vermont, and New York is involved. Lauren Stevens is joined in his quest by the Appalachian Mountain Club and local conservation organizations.

Longtime Mohawk Trail advocates Bambi Miller and Joyce Muktarian are also staunch supporters of the idea. They are representative of many others who live in the area, and their support suggests that the time has come to recognize the historical significance of the original Indian trail and the ecological significance of Mohawk's beautiful mature forest.

Anyone interested in receiving more information about Mohawk or joining its **Friends**, please contact either Bob or Johnie Leverett at 52 Fairfield Ave. Holyoke, MA 01040; (413) 538-8631.

Bob Leverett, the East's preeminent old-growth sleuth and evangelist, writes regularly for Wild Earth.

Whole-Tree Logging

Vacuuming the Northern Forests

by David N. Carle

Whole-tree logging, the removal of the entire tree including all the branches and crown, is both a relatively new form of logging and “the extreme in (forest) management” (Coates 1982). In some areas of the northeastern United States and Canada, whole-tree logging is becoming the practice of choice. Today, on two of the five ranger districts on the White Mountain National Forest (WMNF) 60-75% of the timber logged is by whole-tree logging (US Forest Service 1993). Whole-tree logging could cause severe, long-term impacts to forest health.

Whole-tree logging, or biomassing, is the practice of removing the entire above-ground portion of trees by logging machines. The machines cut the trees at the stump, transport the whole trees to a landing, and then grind the trees, including tops, branches, stems, bark, and leaves, into chips. The chips can be used for pulp, wood products, or to burn. Trees may be selectively cut or clearcut. A whole-tree clearcut (WTC) “represents a more severe disturbance to forest ecosystems than does a stem-only harvest, or a whole-tree selection or small block cut” (Pierce et al. 1993). This makes WTC one of the most severe logging practices in our forests. WTC is common on industrial lands in Maine and New Hampshire (ibid.), and takes place on some public lands including the White and Green Mountain National Forests.

What little research has been done on whole-tree logging has looked mostly at WTC. Whole-tree thinning has scarcely been considered. Despite the lack of research, some 1050 biomass plants are now operating in the United States (Johnson 1993). Wood-to-energy plants in New Hampshire alone burn approximately 1.2 million tons of wood chips (equal to approximately 480,000 cords of wood) a year.

To supply these wood-to-energy plants with wood chips, some areas in the United States have begun planting agricultural fields with genetically selected “super trees.” In New England, though, most of the wood chips come from logging the natural forests. Supplying these wood-to-energy plants with wood chips could have major impacts on New England forests.



SOIL DISTURBANCE

Whole-tree logging uses large, mechanical equipment such as a feller bunchers and skidders. This equipment has increased the amount of soil disturbance in the areas being logged. In a study of four WTC sites, 92% of the soil surface was disturbed on two of the sites, 98% on one site, and 71% on the last site because the rest of the area was too steep and rocky for the operation of heavy machines (Pierce et al. 1993).

Soil disturbance can range from destroying soil structure, thus reducing or eliminating regrowth for several years, to scarification. Scarification is beneficial for the regeneration of northern hardwood species, but is detrimental for the regrowth of spruce-fir type forests. According to one study, "much of the advance reproduction of spruce and fir seedlings was destroyed during the harvesting operation" (ibid.).

Coupled with scarification is the exposure of mineral soil low in fertility and disadvantageous for regeneration. "Exposed mineral soil can become crusted and compacted solely by rainfall impact, to the point where seedling roots may have trouble penetrating the soil" (ibid.).

A related problem of whole-tree logging is soil compaction by logging equipment. Pierce et al. (1993) found that at three WTC sites, 48-81% of the areas were compacted. Compacted soil inhibits "root penetration, aeration, and infiltration capacity, which may lead to soil saturation, erosion, and reduced seedling growth" (ibid.). Indeed, Martin (1988) found that logging equipment can cause compaction on more than 90% of a site. "The evidence seems clear that compaction, however slight, reduces seedling germination and growth to some degree" (ibid.).

STRUCTURE SIMPLIFICATION

Whole-tree clearcutting dramatically changes the vegetative characteristics of the logged area. Species present at the site before logging usually regenerate, but in very different proportions. According to Pierce et al. (1993):

We expect that 75-100 years will be required on each site to establish precutting levels of basal area, biomass and density.

WTC imposed a distinct even-aged structure, likely to persist for 75-100 years, on the forest. Mechanical activity of skidders over most of each site crushed or damaged existing seedlings.

In many cases, economic pressure will cause logging to occur long before the 75-100 years required to restore struc-

tural diversity to the site. Essentially, 75-100 years in the evolutionary succession of the forest are irretrievably lost.

Whole-tree thinning can change the entire structure of a forest. Eastern forests are complex in structure, having multiple layers of canopy. The many different kinds and ages of trees and other vegetation mean multiple layers of leaves. The more foliage layers, or the greater the vertical complexity of forest vegetation, the more breeding birds generally found in the forest (Willson 1974). Whole-tree thinning removes the economically less valuable trees, thereby eliminating the multi-layer canopy. Whole-tree thinning is the foresters' version of ethnic cleansing.

NUTRIENT LOSS

Whole-tree clearcutting removes over 90% of the above-ground biomass, or approximately 20-25% more of the original biomass than a stem-only clearcut (Pierce 1993). Also, nutrients such as nitrogen, calcium and potassium are removed. Indeed, Pierce et al. (1993) found that "WTC removes from 1.2 to over 3 times the nutrients removed with conventional stem-only clearcutting."

In New Hampshire, many biomass operations are thinning "junk" or economically low-quality wood. Yet, this young low quality wood has a high amount of nutrients in the branches and crown. According to Pierce et al. (1993), "The difference in nutrient removals between whole-tree and stem-only clearcutting is greater in young stands than in older stands, because a greater proportion of stand biomass is contained in the nutrient-rich crowns of young stands."

According to R.H. Waring of the Department of Forest Ecology at Oregon State University (1980):

The annual growth of a forest peaks when the forest canopy first closes. A policy to thin or harvest at this time is not uncommon. Unfortunately, the forest's use of nutrients is also highest at this time, so complete tree harvesting results in a major loss of the available nutrients, exceeding 50% of the pool for some minerals such as potassium.

Pierce et al. (1993) found that "a single WTC removed 4-6% of the total N, 5-13% of the Ca, and 2-3% of the K."

Over a 100-year rotation, nitrate is usually fully replaced due to the amount of nitrate in air pollution. Potassium input and output is basically balanced in an undisturbed forest, so any logging causes a depletion. Magnesium depletion is similar to that of potassium.

Presently, acidic precipitation is depleting calcium in the soils of New England. Logging leads to increased leaching of nutrients, and can double the rate of Ca loss.

"With WTC, the loss of Ca is 13-33% in 100 years for one harvest and 21-58% for three harvests at the four sites examined. Acid precipitation and WTC harvest removal contribute about equally to Ca depletion... Calcium depletion already may contribute to Red Spruce mortality at high elevations" (Pierce 1993).

One of the summary conclusions from the Canadian Forest

Whole-tree thinning is the foresters' version of ethnic cleansing.

Service's National Forestry Institute on whole tree removal states:

Harvesting whole trees means the removal of twig and leaf tissues which contain high nutrient concentrations, and account for 28 to 92 percent of the nitrogen, 20 to 83 percent of the phosphorus, 6 to 85 percent of the potassium, and 5 to 87 percent of the calcium in the above ground components (Coates et al. 1982).

Organic matter on the ground conserves forest nutrients, natural fertilizers, soil conditions, water stabilizing elements, and other life supporting requirements (Coates 1982). Humus, organic debris including dead plants, leaves, twigs, tree trunks, and roots in various stages of decomposition, is an important source of nutrients. Hans Jenny of the College of Natural Resources at the University of California, Berkeley, stated:

For soil to function effectively in plant production it must possess substantial water-holding and ion-exchange capacities, good physical structure, and thriving populations of bacteria, fungi, and invertebrates. These attributes are highly correlated with humus substances, which are dark-brown organic macro-molecules rich in phenolic compounds and are derived from plant remains and microbial synthesis. Humus has high absorptive capacity for toxic metals, and its buffering power mitigates the impact of acid rain. Humus maintenance requires a steady influx of plant biomass from root decay and aboveground organic residues (1980, emphasis added).

Biomass operations remove almost all of the above-ground organic residues. According to Pierce et al. (1993), clearcutting of northern hardwoods leads to a decrease in thickness, organic content, and nutrient content of humus. "Within 3 to 15 years after cutting, the O horizon (Humus) is reduced by about one-half."

Little research has been conducted to determine the amount of residue needed to maintain soil conditions for regeneration and growth (Cramer 1974). Despite this lack of knowledge and understanding of the impacts of whole-tree logging, foresters continue to promote it.

ECONOMICS VERSUS ECOLOGY

Presently, the New Hampshire forest products industry is in a dispute with a utility company, Public Service of New Hampshire (PSNH) over the possible buy-out and closing of a number of biomass plants in New Hampshire. The conflict arose because PSNH must, by law, purchase electricity from the biomass plants which is 2-3 times more expensive than other sources of energy. Not discussed in the debate is the impact of whole-tree logging on the forests.

Unfortunately, New Hampshire's foresters and timberland owners favor biomass plants. According to a letter jointly written by David Harrigan, Vice President of the Society for the Protection of New Hampshire Forests (SPNHF), an organization of foresters, and Charlie Niebling, Executive Director of New Hampshire Timber Lands Owners Association, which represents the forest products industry, the biomass plants offer a market for "low quality timber which gluts New

Hampshire's vast second-growth forests" (Niebling and Harrigan 1993). Yet, these same organizations blame the "glut of low quality timber" on past logging practices. According to Richard Ober of the SPNHF, "we faced many years of high grading where only the best wood was taken out" (Nichols 1993). From the economic perspective of a forester, the statement is true. But from a forest ecologist's point of view, that low-quality timber is rejuvenating an ecosystem highly degraded and damaged by past logging. Whole-tree logging is another example of short-term economic gains diminishing the long-term ecological health of a forest.

Research, as outlined above, is beginning to show that whole-tree logging can cause severe impacts to forest ecosystems. The groups supporting biomass plants state that closing the plants would be "poor economic policy, and even poorer energy policy" (Niebling and Harrigan 10/26/93). These groups fail to address the effects these wood-to-energy plants have on the overall health of the forests.

Whole-tree logging mimics nothing in nature. It is a relatively new form of logging and has not been thoroughly studied; but common sense should tell us that removing whole trees will harm the forest. We must work to stop this type of logging. If it continues, our forests may go the way of the Passenger Pigeon. **WERE**

BIBLIOGRAPHY

- Coates, J.F., H.H. Hitchcock, L. Heinz. (1982). *Environmental Consequences of Wood and Other Biomass Sources of Energy*. Office of Strategic Assessments and Special Studies, U.S. EPA. Washington, DC.
- Cramer, Owen P., ed. (1974). *Environmental Effects of Forest Residues Management in the Pacific Northwest*. USDA Forest Service General Technical Report PNW-24. Portland, Oregon.
- Federer, C.A., J.W. Hornbeck, L.M. Tritton, C.W. Martin, R.S. Pierce, C. Tattersall Smith. (1989) "Long-Term Depletion of Calcium and Other Nutrients in Eastern US Forests." *Environmental Management*. Vol. 13, #5:593-601.
- Jenny, H. (1980) "Letters." *Science*. Vol. 209, June 20, 1980.
- Johnson, Robert. (1993). "Electric Utilities Study An old, New Source of Fuel: Firewood." *The Wall Street Journal*. December 2, 1993.
- Martin, C. Wayne. (1988). "Soil Disturbance by Logging in New England—Review and Management Recommendations." *Northern Journal of Applied Forestry*. Vol. 5, #1.
- Niebling, Charles and David Harrigan. (1993). "Readers Forum." *The Laconia Citizen*. November 8, 1993.
- Nichols, Hank. (1993). "Utility's plan loses sight of forest and the trees." *The Boston Sunday Globe*. November 28, 1993.
- Pierce, R.S., J.W. Hornbeck, C.W. Martin, L.M. Tritton, C.T. Smith, C.A. Federer, H.W. Yawney. (1993). *Whole-tree Clearcutting in New England: Manager's Guide to Impacts on Soils, Streams, and Regeneration*. USDA Forest Service General Technical Report NE-172.
- Staebler, G.R. (1979) "Rationalization of Biomass Harvest and Use." *Proceedings: Impact of Intensive Harvesting on Forest Nutrient Cycling*. Broomall, PA: Northeast Forest Experimental Station, U.S. Department of Agriculture Forest Service.
- U.S. Forest Service. (1993) White Mountain National Forest Monitoring Report. Laconia, NH.
- Waring, R.H. (1980) "Opportunities and Constraints on Forests Imposed by Their Nature as Ecological Systems." *Forest Land Use Symposium #1: Discussion Papers*. The Conservation Foundation, Washington, DC.
- Willson, M.F. (1974) "Avian Community Organization and Habitat Structure." *Ecology*. 55:1017-1029.

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An Atlantic Canada Regional Report

Nova Scotia

by David Orton

Green Web (R.R. 3 Saltsprings, N.S., Canada BOK 1P0) is a small research group with a seven-page list of publications, which has the eight-point Deep Ecology Platform printed on the back page. We have a biocentric or ecocentric and anti-capitalist/anti-consumerist orientation. We believe the capitalist world-wide economic system is destroying Earth. This system, with its human-centered view of nature as a "resource" and its roots in endless economic growth and consumerism, has us all on a death path. Needed are new ecological, social, political, spiritual and cultural visions, new environmental ethics, and associated environmental economics, and reductions in human populations. Societies have to be ecologically sustainable for the survival of all species on Earth. —DO

PULP CULTURE AND PULPWOOD FORESTRY

Our region, Atlantic Canada, is comprised of New Brunswick (NB), Prince Edward Island (PEI), Nova Scotia (NS) and Newfoundland (the Maritime Provinces). As regards forestry, we have a "pulp culture," excepting perhaps the small province of PEI, which has no pulp mill. The pulp mills determine the orientation of forestry policy. The specific, mainly softwood, requirements of the twenty or so pulp and paper mills in our region are imposed on our forests. These are some characteristics of pulp mill forestry:

Changes in species composition

Nova Scotia, like New Brunswick and Prince Edward Island, is part of the Acadian forest zone, and in our province are about thirty indigenous tree species. Green Web generally does not support replanting programs (natural reseeding is best and cutting methods should facilitate this), especially since replanting here is of a few softwood species preferred for pulp; no hardwoods are planted. For example, in 1991, maritime forest nurseries shipped 70.5 million seedlings and 88% were of only four species with Black Spruce comprising 54%. In Nova Scotia, New Brunswick, and Newfoundland, planting programs lag far behind cutting programs. In 1988, government figures show 42,000 hectares of forest were cut in NS, with 11,480 hectares replanted.

Clearcutting

Clearcutting accounts for 90% of cutting in Canada. Forest cover is eliminated by this cutting method and even-aged tree farms are promoted. Feller bunchers are increasingly used. These heavy machines destroy the forest ecosystem and eliminate jobs. In northern New Brunswick, loggers have protested the increasing mechanization of woods work and feller bunchers have been burnt. In Newfoundland, forest activists have called for banning mechanical harvesters in the province, including Labrador, and linked the destructive technologies used in the forests to similar technologies that helped bring about the collapse of the East Coast fishery, e.g. draggers.

Pesticides

Clearcutting and the use of pesticides go together. "Plantation forestry" (tree farming) demands human intervention. Herbicides and insecticides have been widely used in our region. In Nova Scotia, five herbicides are currently approved for forestry use: glyphosate (Vision), hexazinone, simazine, triclopyr, and 2,4-D. The timber industry is moving toward the use of biological controls — nematodes, bacteria, fungi, viruses, and genetically engineered organisms. Industry and government portray these as "more environmentally friendly," but they present their own dangers which forest activists do not yet fully recognize.

Habitat loss

Pulpwood forestry simplifies and fragments wildlife habitat. In Nova Scotia, habitat destruction has been accompanied by the intensification of hunting pressures, with new types of hunts being promoted, even though less than ten percent of the public in Canada hunts. Wildlife in Nova Scotia is managed for hunters and trappers, a small and shrinking minority of the population.

Long-term leasing of crown lands

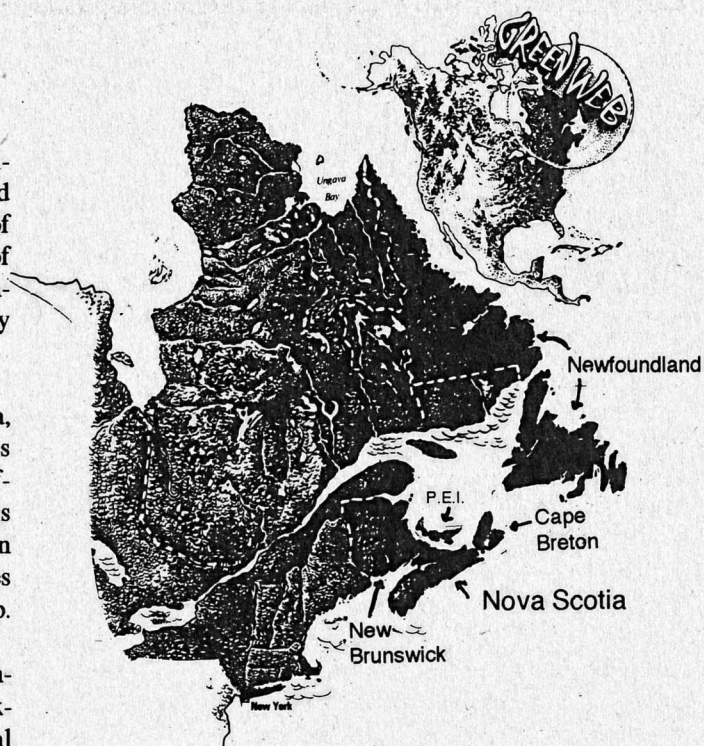
In Newfoundland, New Brunswick, and Nova Scotia, long-term leasing of crown land to pulp and paper companies turns public property into corporate property. Our region differs from most of Canada in that much of the forest land is privately owned, about 50% in NB, 70% in NS, and 90% in Prince Edward Island. The cutting on crown lands undermines the livelihood of private woodlot owners who want to sell pulp.

In Nova Scotia, as across Canada, the pulp and paper industry is in crisis. In our province, all the mills are seeking "extensions" for complying with new (minimal) federal environmental regulations. Stora, the largest pulp and paper mill in the province, has orchestrated a "public" campaign for total exemption from requirements for secondary treatment of its effluent and for more state subsidies. This campaign has so far met minimal opposition from environmentalists in Cape Breton, where Stora is located.

The environmental movement is in a down cycle, and in this it reflects the general situation within society. Environmental despoilers have adapted environmental language to gild their activities. It seems that in Nova Scotia, as across the country, some "activists" are licking their wounds and lying low. Unfortunately, in Canada we also have government-funded environmentalists, who unashamedly call themselves *the* "Canadian Environmental Network." The CEN mouths the mythology of "sustainable development," the theoretical orientation of governments and the business class in Canada. "Sustainable development" accepts the capitalist system as overall framework and asserts that we can continue economic growth and still protect the environment.

A newly emerging theoretical justification for further industrial expansion is the doctrine of "industrial ecology" (born in the USA, see Hardin B.C. Tibbs, "Industrial Ecology: An Environmental Agenda for Industry," *Whole Earth Review*, Winter 1992), which is now appearing in our region. "Waste As A Resource: The Concept Of Industrial Ecology" was a paper given in our region in October 1993 by Lafarge Canada Inc., which is endeavoring in Nova Scotia to burn hazardous waste as fuel in their cement plant. This new doctrine of "industrial ecology," may eventually replace the increasingly contentious concept of "sustainable development."

On the positive side are many community meetings in NS to oppose particular environmental atrocities. Canadian environmentalists and forest activists are increasingly repudiating the concept and thinking behind "sustainable development."



A recent issue of the BC publication *The New Catalyst* (Summer 1993, No.26), also distributed in our region, was called "Great Global Greenwash or The Sustainable Development Scam."

Another positive sign is the start of an alternative forestry discussion by some woodlot owners. The collapse of the East Coast fishery has opened a public dialogue on "what are sustainable technologies?" Also in our province is the "Red Tail Nature Awareness School," teaching earth philosophy, nature awareness and earth skills for children and adults. This centre is interacting with the public school system.

In conclusion, forest activists face four practical issues of immediate concern: One is the whole issue of plantation forestry. Plantation forestry is the embodiment of ecological evil in our region.

The second issue is the increasing use of biological controls in Canadian forestry. Activists need to acquire the knowledge to oppose this.

Third is the contentious issue of ecosystem rights and native rights. How do we build the needed alliances with indigenous peoples, without giving up our all-species ecological perspective?

Fourth is forest activists' attitude toward the pulp and paper industry. Green Web feels this extremely polluting industry, the main force behind forest destruction in Canada and an intrinsic part of the engine of growth, should be drastically down sized.

This article is adapted from a talk David Orton delivered at the Native Forest Network conference held in Burlington, VT, November 11-14. David is a long-time forest advocate and Green Web writer.

Depleting the Wild

Ozone Loss, Radiation Gain, and Natural Systems

by Miles Tager

Last summer, Americans streamed as ever onto sun-drenched gardens and beaches. When the rays became a little too intense for winter-white skin, we lathered on the sunscreen.

Most of us had no understanding at the time of the dangers these actions posed for our health, or the ramifications for the health of our planet. If we considered at all the effects of ozone depletion, it might be to ponder the Antarctic ozone "hole," a far-removed phenomenon that, though monstrous, seemed to present no imminent threat to us or other inhabitants of Earth's temperate zones.

To ease our fears, the mainstream press was standing by to assure us that the chlorine-based industrial pollutants responsible for ozone destruction—CFCs, HCFCs, bromines, halons, and others—were being phased out, that the ozone layer was beginning to heal due to the environmentally conscious efforts of governments and chemical manufacturers. While effectively creating a lull in concern, these efforts did not change the crucial fact: deadly ultra-violet radiation is penetrating the depleted ozone layer more than ever before recorded, not just over the poles but worldwide. On 22 April 1993, NASA announced "1992-1993 global ozone levels lower than any previous year." These increased UV-B levels cause cancer, immune deficiencies, blindness, and destroy living cells in plants and animals, as well as inhibiting photosynthesis and primary production among a host of organisms.

Virtually all life forms on the planet face potential carcinogenic or mutagenic effects from continued production of organo-chlorines by the Du Pont corporation and other multinational chemical corporations. The much touted Montreal Protocol, signed in 1985 and amended in 1990 and 1992, allows production of ozone destroying HCFCs through the year 2030, and provides so many loopholes for continued use of CFCs, the deadliest ozone destroyers, that we risk ever greater ozone depletion, ground level UV-radiation, and health hazards well into the next century.

With skin cancer rates approaching epidemic proportions, the Australian government issued a public health warning in 1990, instructing parents to keep children out of direct sunlight and schools to build shaded playgrounds. In Canada, the federal government initiated a weekly nationwide ozone alert monitoring system, and the Canadian Dermatological Association issued a warning that tanning was no longer safe, especially for children.

Virtually all life forms on the planet face potential carcinogenic or mutagenic effects from continued production of organo-chlorines by the Du Pont corporation and other multinational chemical corporations.

With NASA data showing ozone depletion reaching alarming levels in the populated mid-latitudes of North America, a group of scientists, including representatives from federal agencies, approached the new U.S. administration in April of 1992, asking for a national health alert before the upcoming summer vacation season. The data were suppressed, and no warning given. Such blithe irresponsibility had good precedent: the head of the EPA under George Bush, hapless token William Reilly, went directly from his post, and from representing US interests at the Montreal Protocol agreements, onto Du Pont's board of directors. Du Pont invented chlorofluorocarbons, has been the largest producer and marketer of ozone-depleting chemicals, and ranks as the greatest overall industrial polluter in the United States.

The continuing destruction of the ozone layer and its human health hazards remain a matter of public record and debate. Depletion levels hit 40% over temperate North America and Europe during peak winter "chlorine loading" time in 1993, part of the continuing global decline that a NASA report said "defied all models."

But a pall of silence has attended an even larger issue: What dangers do these depletion levels pose to Earth's non-human inhabitants and its natural systems. For an issue with such fundamental implications, and one known to the scientific community since 1974, disturbingly minimal research has been

devoted to increased ultraviolet exposure on wildlife and wild communities.

Credit this dearth to the Reagan administration. Shortly after election, Reagan made known to his EPA chief Anne Gorsuch and chemical manufacturers that his administration did not consider ozone depletion a problem, so organo-chlorines poured into the atmosphere unchecked for the decade.

The effects of ultraviolet radiation on humans had already been well documented. UV-B causes skin cancers, including basal cell melanoma, which is often fatal. The EPA estimates for every 1% decrease in stratospheric ozone—the present annual depletion rate—a 5% increase in non-melanoma cancers in the United States. UV-B causes cataracts and other vision impairments and inhibits human immune systems.

Researchers have also found a correlation between UV-B exposure and a very rare salivary gland cancer, which may indicate systemic breakdown, in that the damage is to a protected part of the body. UV-B may thus have the potential to destroy animal systems not directly exposed to the sun. If the protective function of not only human skin, but human clothing proves inadequate, what then of fur, feathers, forest canopy, shade, water...?

Research on marine systems done by Dr. Sue Mayer for Greenpeace UK has shown ultraviolet radiation penetrates up to 30 meters deep into the open ocean. UV-B inhibits normal



growth of coral, fish larvae, krill, and phytoplankton, the latter two being the basic stuff of the food chain and critical to the diet of whales and other marine mammals. Phytoplankton decline in Southern Ocean areas under the Antarctic "hole" has exceeded 18%.

Various other organisms in the Southern Ocean have exhibited severe stress response by releasing UV absorbing pigments. Survival thresholds for marine life already threatened by pollution are completely unknown.

Plenty of correlative data exist, from field and laboratory alike, for land-based animals. In Punta Arenas, Chile, the population center nearest Antarctica, both wild and domestic creatures, in some cases entire herds, have developed severe skin and eye lesions, and many have died. Blind salmon have been reported, as well as deformed trees and crops, and an unknown type of red ocean algae has appeared. Scientists acknowledge that these occurrences "coincide" with ozone depletion levels of over 70%, or a 35% increase in ground-level UV-B.

A 1993 study by the Sundance Institute in Colorado linked rising UV levels at high elevations to a decline in frogs, according to researcher Jan Roth. The study found no other environmental damage in the frogs' habitat, but noted a sudden and extreme decline in their population, and discoloration from the animals' normal gray to black on sunny days. Frog eggs exposed to sunlight did not hatch.

Research by Dr. Margaret Kupke of the Anderson Cancer Center in Houston supports the field data: "We already know that ultraviolet light causes immunological effects in humans and that it can also impair immunity to infectious diseases in animals."

True to the commercial bent, and funding, of so much sponsored science, the study of ozone depletion on plants has emphasized cash crop production. Of three hundred species considered, over half proved to be UV sensitive, among them peas, beans, squash, and soybeans. UV-B stunted growth, inhibited photosynthesis and germination, altered root structures, reduced disease immunity, and lowered overall yield. The likelihood of similar results in wild flora was confirmed by a British Department of the Environment study in which about half the species of conifer seedlings examined showed adverse effects from UV-B.

Research on the Loblolly Pine by Dr. Alan Teramura of the University of Maryland revealed that ultraviolet radiation injured needles, cones, and branches, and inhibited reproduction. Teramura concluded: "Small changes in UV can accumulate, and ultimately have catastrophic effects." What could be these effects extrapolated to the massive clearcuts in the US and Canada, with their millions of seedlings growing, or not, without any canopy shade.

The Institute for Environmental Studies at the University of Washington elaborates on the cumulative process: "Photoinhibition by ambient UV-B radiation increases linearly with increasing total dose with no apparent threshold, and it is, therefore, likely that any increase in UV-B will cause additional photo-damage."

These complex interactions defy soundbyte logic, and have garnered little action. An Environment Canada report does at least recognize the potential scope of the issue: "Sensitive species would decrease, reducing the diversity of forests and other ecosystems. Certain species of wildlife, particularly those active during the day, could also suffer health problems similar to humans."

These preliminary indications have established a good groundwork for intensive research, but the data have often sunk in the carefully orchestrated and muddled debate on whether a problem exists at all. For scientists, the complications are both technical and political. They know there is a link, possibly direct, between stratospheric ozone loss and the greenhouse effect, the carbon dioxide build-up responsible for global warming. Dr. Sherwood Rowland, who first discovered the chlorine chain reaction that destroys ozone, stated in 1987: "greenhouse warming and stratospheric ozone depletion will occur in the same atmosphere and their effects not only will be intertwined, but will perturb one another." These atmospheric breakdowns are further compounded by ground level ozone, the toxic smog created by nitrous oxide emissions. All these conditions contribute to cumulative stress on living organisms.

For instance, a 1993 report shows a 25% degeneration of trees in Smoky Mountain National Park: that is, one-quarter dead, dying, disabled, or distressed. This obviously demands immediate action, but traditional methodology has no idea how to proceed when there is no direct cause and effect relationship. Greenpeace's Sue Mayer says that baffled investigators usually resort to the "assimilative approach," whereby the "recognized possible environmental effects are reduced to a few observable results, such as lethal dose, 'safe' margins, or induction of disease." This modeling, Mayer continues, "makes policy look scientifically precise, but only by excluding the possibility of other end effects, indirect effects, or interactions between chemicals. The larger uncertainties, even whether the right terms have been identified, have been buried. They encircle the science rather than being encircled by it."

Within this artificial framework, the model of multiple causation relating to atmospheric disintegration becomes even more amorphous, and easy prey for corporate sponsored pavlovian howls of "alarmist theory." What's needed, Mayer says, is a "precautionary principle," already well recognized in human medicine, whereby non-specific dysfunctions are examined in light of multiple causations and complex interactions. A dead pine or black frog or blind sheep or red algae then no longer presents a riddle without a clue, but becomes an undisputed indicator of environmental degradation and elicits a suitable response. Mayer concludes that this principle allows, as with humans, for Earth's watchdogs to go that one step farther, to prevention: "The precautionary principle demands that the environment must not be left to show harm before action is taken. The burden of proof is shifted from those seeking to protect the environment to the polluter."

On this basis, backed by existing data, we can take the necessary steps to halt the destruction of the ozone layer and begin environmental restoration. The government should notify citizens now about the dangers of ultraviolet radiation exposure due to continuing ozone layer destruction. Production of all ozone depleting chemicals should end immediately—not just be phased out, exempted (for widely defined “critical use”) and replaced by other dangerous chemicals as mandated by the Montreal Protocol. The Du Pont Corporation, backed by its largest shareholder, Canada’s Seagram Corporation, continues to make, market, and lease production rights for a host of ozone depleting chemicals in non-Protocol signing countries.

Truly safe alternatives to CFC-based products are currently on the market in the US and Europe, but are caught in Du Pont’s marketing vice. Many are produced by simple, non-patentable technologies, which are easily adaptable for smaller companies, therefore posing a serious threat to the profit margins of large chemical corporations.

All environmental impact statements and biological surveys should henceforth take into account increased ground level ultraviolet radiation. A national monitoring grid on the Canadian model should be instituted to measure UV radiation levels, not only in population centers, but in agricultural and wild areas.

Funding should be made available immediately—through EPA, United Nations Environment Program, NASA, or the Protocol signatories—for a massive independent research project to gauge UV-B impact on wildlife, for example its effects on migratory bird species, already decimated through habitat loss and exposed to UV-B at high altitudes.

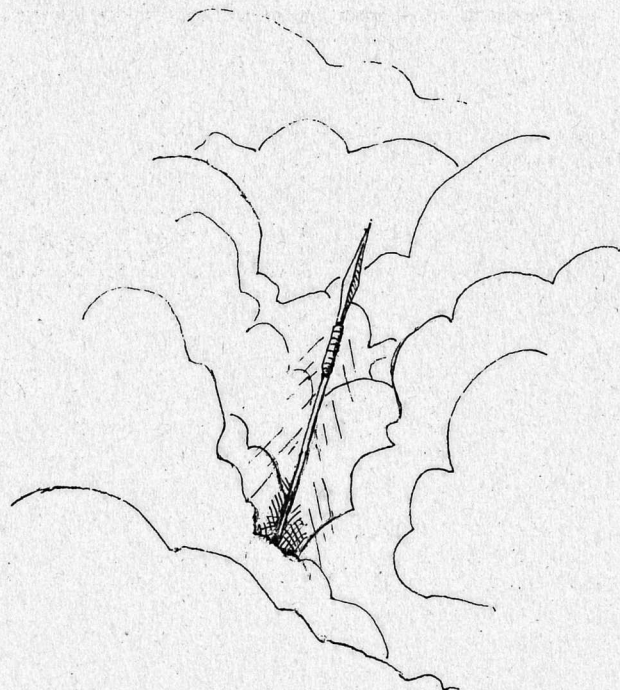
On a personal level, adhere to some basic admonitions: Do not tan (sunscreen is useless, even dangerous, as it turns off the body’s natural warning, sunburn, to dangerous UV-B levels), adopt a chemical-free lifestyle, work with your local schools and communities to shield your children, and avoid Seagram’s products (which include the Tropicana line of orange juices).

Beyond that, activists should introduce the issue of ozone depletion into the essential framework of both environmental debate and scientific research, and specifically into issues of wildland restoration.

For more information contact:

EPA Ozone Hotline: 800-296-1996
The Atmosphere Alliance: 206-661-2817, P.O. Box 10346, Olympia, Washington 98502
Ozone Action: 34 Wall St., Suite 203, Asheville, N.C. 28801
Greenpeace USA: 202-462-4507, 1436 U St. NW Washington, DC 20009
Union of Concerned Scientists: 26 Church St. Cambridge, Massachusetts 02238
EPA Atmospheric Program: Director William F. Barnard, MD-44 Research Triangle Park, North Carolina 27711

Miles Tager is a freelance writer based in Asheville, NC. He works with Friends of Grandfather Mountain (FOGM; POB 965, Asheville, NC 28802) and Ozone Action. To join the growing campaign against Du Pont, write Ozone Action.



Ozone

The day blue vanished
the elders met
in the center circle.
They prayed for 10 days
but nothing happened.

“We’ll have to learn
to live without it,” they said.
People from other tribes
didn’t like this
and came over to war.

The wind caught word.
That was the night
we put away our spears
and huddled
around the fire.

—Scott Starbuck (1718 S. Jen Tilly Ln.,
Apt. 114, Tempe, AZ 85281)

Lessons From Lone Pine

anatomy of a burn

by Mark Gaffney



The Lone Pine Fire started on a hot afternoon in August 1992, about ten miles east of Chiloquin, in the Winema National Forest in south-central Oregon. The cause has never been confirmed. Within hours the blaze spread over more than 3000 acres of a forest described in a 1950s federal study as "the finest stand of ponderosa pine in the world."

After seven years of deepening drought, conditions in the woods were extreme. To make matters worse, the fire occurred in Mule Deer winter range, an area that for years had been managed to provide maximum cover and forage for a deer herd two to three times the historical carrying capacity. As a consequence, little or no prescribed burning had been done in the area, even though the forest ecology of the Winema historically was shaped by a natural fire regime of frequent low intensity burns. Instead, all wildfires had been actively suppressed for at least seventy-five years, and fuel loads were unprecedented, with high bitterbrush and dense understory throughout much of the area. I know because I walked the future burn zone in 1990, while working on the Winema

old-growth inventory. The area boasted some of the finest old-growth stands on the forest, including one ancient conifer stand on Calimus Butte with giant Sugar Pines and White Firs, some with 50 inch dbh (diameter at breast height.) I well recall the abundance of songbirds.

For five long hot days the fire raged out of control, settling down to rest each evening, flaring up again in the heat of the following day. Driven southeast by winds from the northwest, the fire's leading edge made repeated runs, while spotting new secondary blazes as much as a quarter mile ahead of the main columns. These secondary fires made it impossible for fire crews to establish, let alone hold, a line in its path. Eventually crews were forced to back off and establish, instead, a perimeter parallel to the path of the fire along its flanks. From such points of relative safety, firefighters could do little more than watch as the firestorm roared southeast until, on the fifth day, after consuming nearly 31,000 acres (including 4700 acres of old growth), the beast finally ran out of fuel, sputtered, and was corralled.

Lone Pine was the largest wildfire in Oregon during the long hot summer of 1992. It was also a natural spectacle, awe-inspiring. I talked with seasoned firefighters who told me, still bug-eyed, that they'd never experienced anything like it. Though a wonder, the fire was at least matched by the phenomenal human melodrama that followed in its wake. Even as mop-up crews worked the fire zone, which smoked and smoldered for a week, a familiar all-too-human hysteria crept into the local community. At issue, a sudden astounding windfall, and for that prize, consuming desire: millions of fire-killed trees over an entire landscape, an estimated 100 million board feet of prime mostly Ponderosa Pine saw timber just sitting there like ripe fruit on the vine waiting to be plucked. It was a logger's dream come true. The Forest Service

wasted no time announcing preparation of salvage sales and a decision at the earliest possible date. Apparently, even this was not soon enough: Within weeks Winema Forest administrators came under mounting pressure from local county commissioners and the timber industry, backed by their power brokers, Senator Mark Hatfield (R-OR) and Representative Bob Smith (R-OR), to get those dead trees cut and to the mills before they could lose a dime's value. In the face of this second storm, what could the bureaucrats do but hang tail? The Forest Service was as philosophically ill-equipped to resist political interference as it had been physically incapable of halting the earlier wall of wild flames.

So it came to pass in a moral welter that the concerns of local environmentalists were spoken, duly entered into the NEPA record, and then politely ignored. Conservationists wanted sizeable control areas set aside, reserves where standing dead trees would remain unharvested, so that natural recovery could occur and be studied over time—years later to be compared with the rest of the burn slated for salvage and artificial regeneration. Such proposals did not seem visionary to those of us who advanced them, only sensible. Instead, the Forest Service promised to retain snags in ALL tree size classes and to meet or exceed forest plan standards on snag densities throughout the burn. Conservationists objected, to no avail. This salvage operation was a freight train on a fast track, and unstoppable. By early spring 1993, the lines in the field were flagged, trees marked, and chainsaws screaming. Dusty caravans of loaded log trucks—at the peak, over two hundred a day—began thundering

through the usually quiet little town of Chiloquin en route to the mills, mostly on the Westside, a hundred or more miles yonder.

By mid-summer 1993, logging of the largest round of salvage sales was mostly completed. After acquiring permits, local conservationists entered the scene of destruction. We immediately discovered, to our surprise and disappointment, a conspicuous absence of large snags, despite the explicit Forest Service commitment “to leave snags of all sizes, including representatives from the largest tree size classes.” Plentiful smaller snags had been left throughout the salvage zone, but vanishingly few greater than 30 inches dbh had been left. As it turned out, closer examination of the pertinent Forest Service planning document revealed a curious inconsistency in the ar-



rangement of tree size classes. The fine print showed that although the Forest Service had arranged the categories in ascending two-inch increments up to 22 inches dbh, thereafter the rules inexplicably changed. Over 22 inches, all trees were simply lumped together in one large size group.

Conditions on the ground reflected the fine print. Though much of the burn area had contained a generous scattering of large to very large trees before the fire, punkin' size snags were almost nowhere to be seen. With few exceptions, the largest snags were within the 22-24 inch dbh size bracket. In short, by stacking the deck, the Forest Service finessed a shaky resolution of its self-perceived dual-mission to extract the maximum timber volume while still meeting the minimal letter of the law regarding wildlife standards, i.e., retaining snags "of all size classes."

Outraged by this sleight of hand, local environmentalists aired grievances in a pointed August 30 letter to the Lone Pine Fire Recovery ID Team. During a September 7 tour on site, we discussed snags with Chiloquin District Ranger Gene Klingler and staff. We were told that the Recovery ID team had discussed the option of leaving greater numbers of very large snags during the project's brief planning phase, but had rejected the idea since it was believed that very large snags (i.e., 30-50 inches dbh) could be expected to stand only a few years longer than their cousins in the 22-24 inch dbh range. The ID team's judgment was that very large snags represented little or no added gain for wildlife, compared with snags that were considerably smaller but still technically within the largest size class. We were told also that little or no scientific literature on the subject of snag longevity existed, and we were told that, in any event, Winema forest plan standards actually had been exceeded.

Local conservationists then initiated an independent investigation of the snag issue. We already knew that Winema forest plan guidelines on snag size were woefully inadequate. We had brought this deficiency to light previously in an old-growth lawsuit in which we are the local plaintiffs. A brilliant review of the scientific literature by our attorney David Edelson of the Natural Resources Defense Council (NRDC) had noted research published in 1986 and 1987 by Forest Service scientist Evelyn Bull demolishing all current Eastside snag retention standards. Several studies by Bull in the Blue Mountains demonstrated that the *average* size of snags utilized for nesting by Pileated Woodpeckers, one of our Eastside indicator species, is 32-33 inches dbh.¹ This figure is not even approximated by current Winema standards which, based on outdated 1970s research, require snags of only 21 inches. This was the standard, we were informed, that was so beneficently exceeded by the Lone Pine Fire Recovery Plan.

Nor, we knew, is the Pileated Woodpecker the only native species in eastern Oregon requiring very large snags for roosting and/or nesting. At least two others, the Williamson Sapsucker and a transient, Vaux's Swift, also require very large snags.²

With all this in mind, we began investigating the closely related issue of snag longevity. What we learned confirmed our fears and was in sharp contrast to what we were told during the September 7 meeting. We learned that research on Ponderosa Pine snag longevity had been conducted by a forester, F.P. Keen, on a neighboring forest to the south, the Modoc National Forest, and published as early as 1927. Keen later did a second major study right in our own backyard, on what is now the Winema NF, which was published in 1955. So much for "little or no scientific literature."

In this second article, Keen took pains to note that very large snags often last much longer than smaller snags, and he suggested the reason: very large snags have much more heartwood than smaller snags. Heartwood, being denser than the sapwood that predominates in smaller trees, resists decay significantly longer. Therefore, very large trees make snags that, on average, last considerably longer—not just a few extra years—and for this reason are of disproportionately greater value to wildlife.³ All this made perfect sense to local environmentalists, and prompted wonderment at how the Forest Service could remain blissfully unaware of research conducted by its own scientists.

We also discovered that the longevity of very large snags in a burn zone such as Lone Pine may be enhanced due to an effect observed by another Forest Service researcher, W.G. Dahms, in 1949. Dahms noted that fire-killed pine snags in eastern Oregon remained standing **roughly twice as long** as trees killed by beetles. Accordingly, if a 22 inch dbh beetle-killed pine produces a snag that stands for 20 years, a fire-killed tree of the same size would last roughly 40 years. And if a 38 inch dbh beetle-killed pine produces a snag that lasts for 40 years, a fire-killed pine of the same size would stand for a whopping 80 years.⁴

The difference between these two cases, a full doubling of snag longevity caused by fire hardening, indicates that the Chiloquin district staff reached a hasty judgment when they concluded that retaining very large snags represented only a marginal gain for wildlife. Assuming Dahms's research is valid, the gain to wildlife from very large snags is substantial. In a severe burn area like Lone Pine, where regeneration is expected to take many decades, and where opportunities for future snag replacement are very limited, it would be hard to overestimate the importance of leaving the biggest snags.

None of this snag information is surprising. These concepts are matters of common sense. Yet, the simplest truth apparently remains too elusive for the Forest Service. Though the agency should be managing burn zones, especially those from large hot burns, to provide habitat for cavity nesters so these birds can persist, clearly, in the economic interest of generating maximum cut volume, they are not. In the case of Lone Pine, it is a short gain fumble that is liable to have serious long-range consequences. Since, due to its intensity, the Lone Pine fire left relatively little in the way of a forest mosaic, a serious deficiency of snags will develop throughout the area, as the

last existing snags fall. A "hole" devoid of habitat will then occur over thousands of acres. As keystone cavity nesting species drop out of the ecosystem, biodiversity will decrease rapidly; a cascade of biological effects will ripple through the system, effects we cannot predict, but that are certain to be deleterious to forest health. The loss of biodiversity may persist for many years, until nature can produce trees large enough for suitable new habitat.

Nor is Lone Pine likely to be a lone scenario. Rather, it portends a growing problem on Eastside forests throughout the region. Loss of biodiversity following over-eager salvage of large intense burns is likely to be repeated again and again, economic realities being what they are, because large hot fires like Lone Pine are the trend east of the Cascades. This is due to the unprecedented and increasing fuel loads on Eastside forests, caused by nearly a century of wildfire suppression and extensive logging. This threat to biodiversity is likely to remain a problem for many years into the future, long after Eastside restoration has begun. Given so much abuse for so long, restoration—featuring various site-specific combinations of understory thinning, salvage and prescribed burning—will probably take at least ten years to produce noticeable improvement on the ground. In fact, restoration is far from certain, since many obstacles remain, not the least of which is a lack of consensus among environmentalists on how best to proceed.

The lessons of Lone Pine are not limited to snags, nor even to biology. The deeper issues are all too human. Perhaps the question most in need of an answer is why the Forest Service, which claims to base policy on the best available science, re-

mains so doggedly reluctant to listen to its own scientific experts. In my opinion, only two possible explanations can account for this. Either, as others have argued, the Forest Service simply is committed to resource extraction at any cost, and hence is corrupt beyond easy redemption; or the agency is just plain incompetent, burdened with too many employees whose chief loyalties are to retirement pensions rather than to the forest placed in their safekeeping.

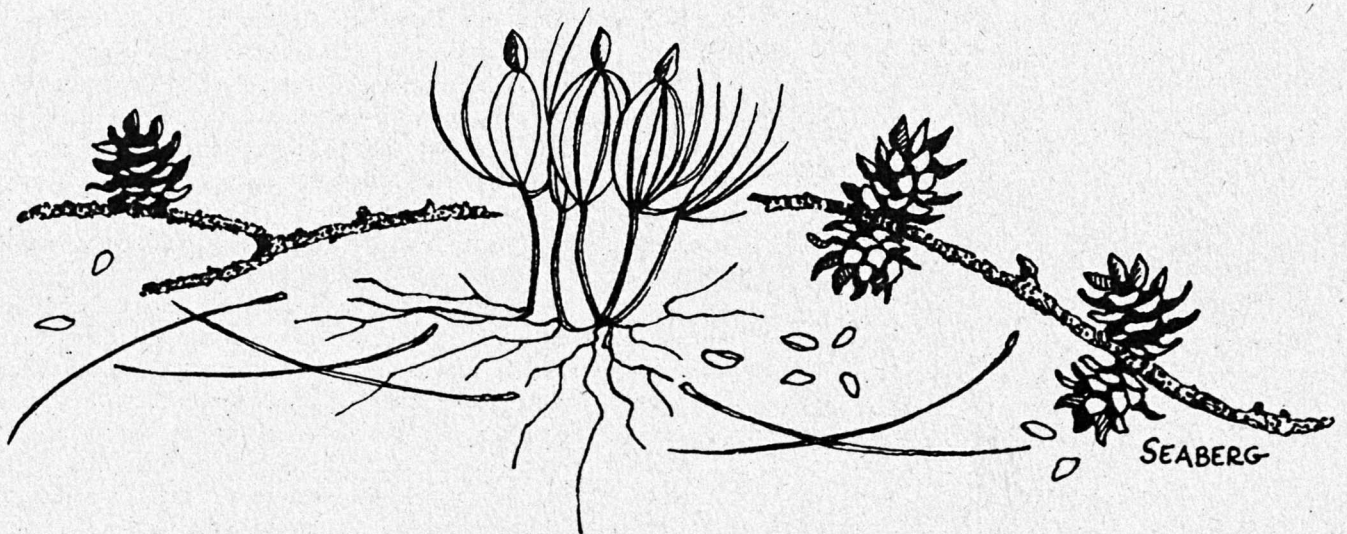
Corruption or incompetence. Take your pick. As Soren Kierkegaard phrased it: Either/Or.

Or maybe: shades of both. **WERF**

NOTES

1. Evelyn Bull, "Ecology of the Pileated Woodpecker in Northeast Oregon," *Wildlife Management*, 1987, pp. 474 and 479.
2. Evelyn Bull, *Resource Partitioning Among Woodpeckers in Northeastern Oregon*, USDAFS Research Note PNW-444, June 1986, pp. 5 and 8; also see Bull, "Summer Roosts and Roosting Behavior of Vaux's Swifts in Old Growth Forests," *Northwestern Naturalist*, Autumn 1991, pp. 78-79.
3. F.P. Keen, "The Rate of Natural Falling of Beetle-Killed Ponderosa Pine Snags," *J. Forestry*, Oct. 1955.
4. W.G. Dahms, *How Long Do Ponderosa Pine Snags Stand?* USDA Forest Service, Pac. NW For. Range Exp. Sta., Res. Note 57.

For more than three years Mark Gaffney (9620 Sprague River Rd. Chiloquin, OR 97624) helped the National Audubon Society inventory and map old-growth forests in eastern Oregon.



The Eagle's View of Ward Valley

*Environmentalists and Native American Tribes
Fight Proposed Nuclear Dump in the Mojave Desert*

by Philip M. Klasky

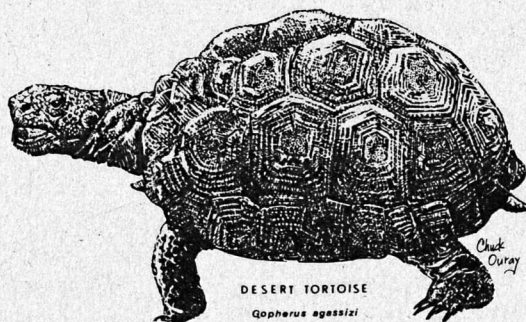
Flying above the Mojave Desert in a four-seater Cessna gives you more of a sense of adventure than a feeling of security. The small airplane is like a surging two-door passenger car with wings, but the view is magnificent. The horizon expands as we fly above a wide tilting desert valley with flood-scoured alluvial fans and sage green washes of Smoke Tree and Mesquite. Buried mountain ranges emerge like islands from a sea of Creosote Bush. The Colorado River catches glints of sunlight as it winds through the dry landscape toward Mexico. I look east toward pinnacles of granite and watch a Golden Eagle climb heated columns of air below us.

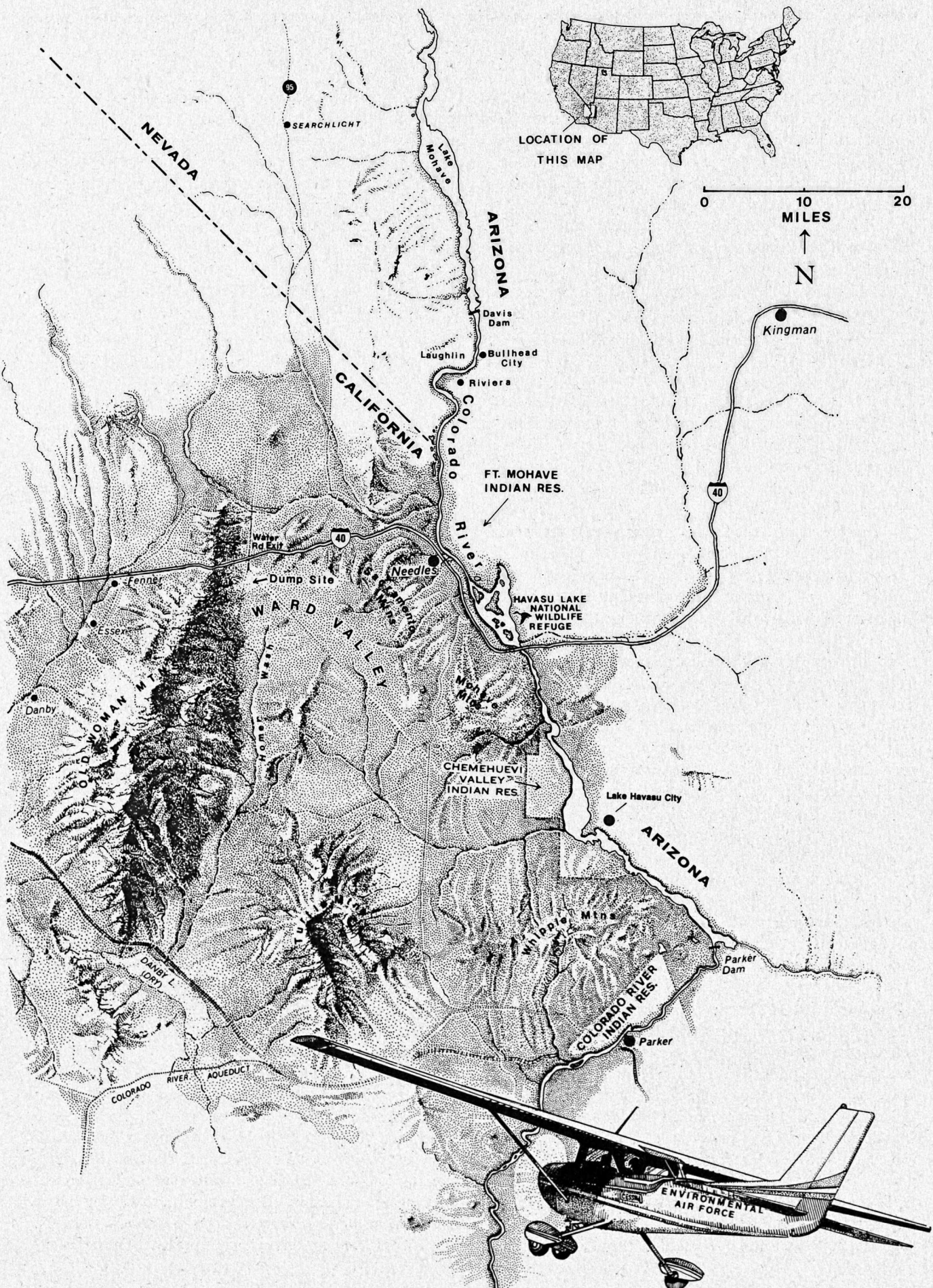
The Environmental Air Force, an international volunteer organization of pilots concerned about the environment, arranged for a pilot and his aircraft to assist on our "mission" to conduct an aerial survey of Ward Valley in the east Mojave Desert, proposed site of a radioactive waste dump. (See my previous *WE* article, *Desert Tortoise vs. Nuclear Dump*, Vol. 3, #2.) A powerful waste company, US Ecology, plans to bury radioactive wastes from commercial nuclear reactors in shallow unlined trenches above a huge underground lake and 18 miles from the Colorado River along the border of Nevada, California and Arizona. Environmental groups, desert residents and Native American tribes have been fighting the nuclear utilities and California Governor Pete Wilson over the controversial project.

From 1000 feet above it becomes obvious that flash floods could simply unearth shallow graves of toxic wastes and carry them into the braided stream bed that traverses Ward Valley. Our photographers systematically record the alluvial fans, washes and vegetation to assist in a study by geologists with the U. S. Geological Survey, who have risked their jobs by asserting that nuclear wastes leaking from the dump could contaminate the Colorado River.

The geologists alerted Secretary of the Interior Bruce Babbitt of the threat to the Colorado River, but Babbitt dismissed the report, tried to discredit the geologists, and moved ahead with the project. This led to a showdown between Babbitt and Senator Barbara Boxer (D-CA), who accused the Secretary of a "cover-up" of the dangers of the proposed dump.

Ward Valley is federal land administered by the Bureau of Land Management (BLM), an agency under the Interior Department. A prerequisite for construction of the dump is a land transfer to the State of California. Last spring, Secretary Babbitt wrote Governor Wilson that he would not sell the land to the state until Wilson held a hearing on the project.





US Ecology has left a trail of leaking dumps and litigation across the nation. Once called Nuclear Engineering Corporation, US Ecology operated a waste disposal site at Maxey Flats, Kentucky, until leaks forced a shutdown in 1977. Maxey Flats is now a Superfund site. US Ecology's Sheffield, Illinois, radioactive waste dump is also leaking. The Illinois attorney general sued the company for \$97 million but settled for only \$8 million. Their Beatty, Nevada, dump has been closed twice for violations.

Before a hearing could take place, Wilson licensed the dump contractor and Babbitt certified the supplemental environmental impact statement, brushing aside environmental concerns such as possible contamination of area aquifers and the Colorado River. In November, feeling the heat from environmentalists and the determined Senator Boxer, Babbitt backed away from his support of the dump and told Wilson that the land transfer will have to wait until the outcome of a California Environmental Quality Act (CEQA) suit filed by environmental groups, the City of Needles and the Fort Mojave Indian tribe.

The sophisticated public relations campaign by the nuclear industry would have the public believe that Ward Valley will be home to hospital gowns and booties and an occasional X-ray machine. US Department of Energy records, however, show that the dump would receive some of the longest-lived and most dangerous wastes—including cesium, strontium and plutonium—from nuclear power reactors. There are even plans to bury dismantled reactors among the Cholla Cactus, Arrowweed and Mojave Yucca. Ward Valley would become another subsidy to an ailing yet influential industry that has yet to resolve the problems associated with clean-up and containment of the poisonous by-products of nuclear energy production.

Dump opponents include grassroots organizations such as the Bay Area Nuclear Waste Coalition, Greenpeace, Alliance for Survival, and Desert Citizens Against Pollution; technical consultants and nuclear scientists with the Committee to Bridge the Gap and Physicians for Social Responsibility; public interest groups such as California Public Interest Research Group, Nuclear Information and Research Service, and Americans for a Safe Future; the Fort Mojave, Chemehuevi, and Colorado River Indian tribes; and the City of Needles, California.

The airplane banks sharply toward the south and we follow the valley along Homer Wash, a long shallow stream bed active in the wet season and during rainstorms. Geologists believe that an underground river fills and flows through the fractured volcanic bedrock under the Turtle Mountains east to the Colorado River. To the west are the Old Woman Mountains with ancient drawings of native dancers, intertwined snakes and Desert Tortoises etched into the sedimentary rock.

According to the Fort Mojave Indian Tribe, or Aha Macav, as they call themselves, Ward Valley is the birthplace of the Desert Tortoise (*Gopherus agassizii*), a species that has remained relatively unchanged for the last 70 million years, sur-

living the perils that exterminated the dinosaurs. The Mojave population of the Desert Tortoise was listed as Threatened under the Endangered Species Act in 1990; its numbers have declined by half in the last seven years. Biologists have warned that protection of the Ward Valley tortoise habitat is critical to its survival. Dr. Robert Stebbins, famed for his intricate drawings animating the pages of nature guides, describes Ward Valley as a vital genetic corridor between the last remaining subpopulations free from diseases that are destroying the tortoise in the west Mojave Desert.

The US Fish and Wildlife Service (FWS) is in the midst of a heated debate about this Threatened species. Dump opponents are challenging the FWS to abide by the mandates of the Endangered Species Act and preserve the area.

The FWS's own Recovery Plan for the Desert Tortoise, released in the spring of 1993, described Ward Valley as habitat for "currently the largest and most robust population of tortoises in the geographic range." The California Department of Fish and Game and BLM biologists have long considered Ward Valley the best Desert Tortoise habitat in the Mojave. US Ecology has offered to move the tortoises from the site to an area across Interstate 40 and build a fence along the highway to mitigate the effects of a facility.

Responding to overwhelming biological evidence, the Fish and Wildlife Service recently proposed Ward Valley as "critical habitat" for the tortoise. But FWS and BLM officials have indicated that they may exempt the area from protection for "economic" reasons.

Last year, as George Bush left office, outgoing Interior Secretary Manuel Lujan tried to transfer the land by sidestepping the environmental review process. Attorneys for the Ward Valley Coalition halted the transfer in federal court using the prohibitions of the Endangered Species Act. If Secretary Babbitt attempts to transfer the land, Coalition attorneys are prepared to assert that the Endangered Species Act calls for "no destruction or adverse modification of critical habitat."

The plane dives toward the dump site. US Ecology has constructed a network of roads, a weather station, and five wells in the area where they propose to cut five trenches the size of football fields. We hang out the window at 100 miles an hour and capture the insult with our cameras. I make a mental note to investigate legal recourse for the damage.

The 1980 Low-Level Radioactive Waste Policy Act mandates that the states take responsibility for waste generated within their borders. The Act encourages states to form regional compacts and to host a radioactive waste dump in turn. California is in the Southwestern Compact with Arizona, South Dakota and North Dakota. Radioactive dumps in Illinois, Kentucky and New York have been closed. The nation's two remaining low-level radioactive waste dumps, at Richland, Washington and Barnwell, South Carolina, are closing and no other state has agreed to open its doors to nuclear wastes.

The Nuclear Regulatory Commission has unilateral "emer-

agency access provisions" to direct nuclear wastes from anywhere in the country to any open dump. Last year the Southwestern Compact Commission, appointed by the governors of the four far-flung states, decided to keep the option of accepting out-of-compact waste at Ward Valley. Dump opponents fear Ward Valley would become the nation's dumping grounds for over 112 commercial nuclear reactors.

The recently decommissioned Yankee Rowe nuclear power plant in Massachusetts has already begun to ship its irradiated components to the Barnwell repository even though that dump is leaking. A 100 car train carrying radioactive toxins from the dismantled power plant was met by protesters trying to attract national attention to the government's fractured nuclear waste policies.

US Ecology has opened an office in the small town of Needles, donated computers to the local school, and promised jobs and \$1 million per year for the 30 years they would operate the dump. But Needles residents, led by a feisty mayor, still oppose the dump. Likewise, the Fort Mojave Indian Tribe firmly rejected US Ecology's offer to build a museum and cultural center.

The nuclear industry has targeted isolated towns, impoverished communities, and Native American tribes with the nation's most dangerous toxins. Corporations anxious to relieve themselves of the liability of contaminating wastes converge on the politically disenfranchised, who are vulnerable to political pressure and "economic benefits packages." In its search for a place to store high-level waste, the Department of Energy has offered "grants" of \$100,000 to \$3 million to Indian tribes willing to site a monitored retrievable storage (MRS) facility on their reservations. Tribal reservations are exempt from state environmental regulations.

As we head toward a dramatic outcropping of granite mountains, Steve Lopez of the Fort Mojave Indian Tribe points out the footpaths his people have used for the spirit runs through the desert to the Old Woman Mountains. Ward Valley is aboriginal homeland for the Fort Mojave, Chemehuevi and Colorado River Indian tribes. The tribes use the valley to collect medicinal herbs and perform religious rites. Once a method of communication between tribes, the spirit run is now regarded as a test of athletic endurance and spiritual faith within a reclaimed tradition. The Aha Macav describe the run as a proclamation of their opposition to the threat to destroy their traditional territory.

The shallow graves at Ward Valley would accept as much as 100 pounds of plutonium, one of the most poisonous substances on Earth, with a half-life of 24,000 years. The assumption that we can isolate such radioactive materials from the biosphere reflects an ignorance of Earth history.

It takes equal parts science and fantasy to envision what would be needed to guard substances that remain deadly beyond collective memory. Radionuclides such as plutonium, pro-

duced only in the last 50 years, will pose a threat to life for the next 12,000 human generations through periods of dramatic climatic and geologic changes and social and political upheaval. The level of witness and responsibility needed to safeguard these poisons through time requires a commitment unprecedented in human history.

Dump opponents have offered a comprehensive policy for one of the most perplexing problems in modern times. First on the agenda is a moratorium on the production of radioactive wastes from nuclear power reactors as appropriate technologies are developed to deal with the waste that already exists. Fuel rods from nuclear power reactors should be isolated from the environment above ground in monitored retrievable storage facilities at the location where they are produced.

The government should begin an ongoing inventory of biomedical radioactive wastes and the capacity to store the wastes on-site until decay. When toxins are shipped off-site, they often end up in minority communities. Production of radionuclides needs to be tied more closely to both risks and rewards. The extremely dangerous waste containment problem is made worse by the public's ignorance and the government's denial.

Deliver the photographs from our trip to Howard Wilshire, a geologist for the last 32 years with the U.S. Geological Survey. Working in a team of earth scientists, Wilshire is spending 16 hour days preparing a report for Senator Boxer that analyzes potential groundwater pathways through the Mojave Desert to the Colorado River. At first, the Interior Department tried to silence him; then they told him that he could work on the report but only as an individual and not as a government employee. Wilshire will submit his report directly to Boxer, and not to his boss at the Interior Department.*

"They call us radical," he says, "but I believe that we are being conservative. I feel an obligation to the voices that are not being heard in this debate. We are just not willing to leave the legacy of a poisoned earth to future generations."

Among the photographs on the viewing table is a wall of petroglyphs we found near the Chemehuevi Indian reservation at a place called West Well. Etched into the monoliths of rock are primitive figures of the Desert Tortoise, an ancient species with a message about guardianship of the land and our contract with the future. **WERF**



Philip Klasky (2760 Golden Gate Ave., San Francisco, CA 94118) is a freelance writer and a member of the Ward Valley Coalition. For information about how you can help protect the desert from nuclear contamination, call the Coalition at 415-752-8678.

*Editor's note: Howard has also risked his career to reveal damages to Mojave Desert soils wrought by off-road vehicles. See his article in *WE* vol. 2 #1.

The Brookhaven Irradiated Forest

and Other Nuclear Victims

by Mary Byrd Davis

In our concern about the human victims of radiation experiments during the Cold War, we should not forget the animals and plants that were similarly sacrificed.

Experimentation in laboratories with animals was common. Among the research reports from the French Atomic Energy Commission (CEA) are "Conditioning of Primates for Experimentation" and "Comparison of Acute Mortality in Baboons and Dogs after Inhalation of PuO₂ [Plutonium dioxide]." An infamous animal experiment in this country entailed dressing 111 pigs in miniature army uniforms and exposing them to two nuclear explosions in order to learn what fabric would best protect soldiers from burns.

Such testing is not surprising, given that animal experimentation without informed consent continues today. Less well known is that scientists deliberately subjected artificially established plant communities and natural ecosystems to radiation.

In 1953 two biologists, A.H. Sparrow and W.R. Singleton, described in *The American Naturalist* the use of a cobalt-60 source to irradiate a field of cultivated plants at Brookhaven National Laboratory in central Long Island. Later experiments usually substituted cesium-137 for cobalt-60, because cesium-137 is longer lived. Both provide the desired gamma radiation.

In addition to its irradiated field, Brookhaven National Laboratory possessed the "Brookhaven irradiated forest," a natural oak-pine wood dominated by White Oak, Scarlet Oak, and Pitch Pine. Starting in 1961, researchers subjected the forest to radiation for at least 12 years "to appraise the potential effects of ionizing radiation at ecological levels of organization." Radioactivity could be detected 140 or more meters from the source. Within six months of the start of irradiation, five concentric zones of vegetation were evident, the nearest to the source being the 0-20 meter "devastated zone."

Within the Cadarache Nuclear Studies Center in Provence, France, the CEA irradiated a seven hectare valley from 1969 until at least 1987. Numerous articles and doctoral dissertations have been written about the effects of gamma radiation on the site's plants, microorganisms, and insects. Researchers wanted to learn if ionizing radiation would have the same impact on a Mediterranean ecosystem as on ecosystems elsewhere. Roughly speaking, it did. After only 9000 hours of irradiation all vegetation within an inner circle was dead; and plants farther out exhibited such changes as loss of flexibility in leaves, inhibited development of protective tissues in stems, and replacement of buds by lignous excrescences or scaly growths. Prior to the irradiation the area had undergone no human disruption for a third of a century; and in 1968 had been declared a "protected biological reserve."

At the Whiteshell Nuclear Research Establishment in southeastern Manitoba, Canada, a boreal forest was the victim of irradiation, which continued from 1973 to at least 1984. The forest was uneven-aged with most trees younger than 70 years. About two-thirds of the irradiated area, which had a 500-meter radius, was a Black Spruce community; the balance, mixed forest communities of Jack Pine, Balsam Fir, Paper Birch, and Trembling Aspen. Researchers found the coniferous climax species "to be most radio-sensitive, although all tree species [were] injured."

To determine the effects of gamma radiation on *Krameria parvifolia*, a shrub community in the northern Mojave Desert was irradiated for ten years. The area is within the Nevada Test Site. In north-central Colorado, 1.2 hectares of shortgrass prairie, part of the Department of Agriculture's Agricultural Research Service Central Plains Experimental Range, was irradiated with up to 8750 curies for at least four years.



As we might expect, short-term experiments were more common than long-term. Among them was the North Central Forest Experiment Station's study of the Enterprise Radiation Forest south of Rhinelander, Wisconsin. Here the Station's Institute of Forest Genetics irradiated a second-growth aspen and aspen-maple-birch forest during the 1972 growing season. In Puerto Rico's Luquillo Experimental Forest, researchers irradiated an area of rainforest from January to April 1965. They compared recovery of the area with recovery in a cut area and in two areas to which differing amounts of the herbicide Picloran had been applied from the air.

Scientists in Georgia transported to an outdoor irradiator at Emory University lichens and at least one entire ecosystem—a granite outcrop island in a small depression on Rock Chapel outcrop, DeKalb County. A doctoral candidate divided the system into 12 small patches, complete with soil biota to a depth of 13 centimeters; then he transferred the patches to a simulated granite outcrop for 14 months of irradiation. He learned that the diversity of arthropods and plants declined as exposure increased. Like many other US irradiation studies, his research was subsidized by the Atomic Energy Commission (AEC).

J. Frank McCormick of the University of North Carolina, whose work was also subsidized by the AEC, explicitly applied the findings from his experiments to forecasts of the impact of nuclear war. Using a portable 9200 Ci cesium-137 source, he irradiated eight ecosystems for 200 hours each. He discussed in a 1967 symposium on radioecology his irradiation of the first, a Slash Pine/Longleaf Pine forest at the Savannah River (nuclear) Plant. His results, he said, showed that in the Southeast, a nuclear war would destroy all pine forest and have severe impacts on approximately 15% and minor effects on 85% of the deciduous-evergreen forest. (These effects, apparently, are short-term. We may now assume that long-term genetic effects could be severe.)

The areas that biologists irradiated were not large. Therefore, they killed relatively few plants and animals; but the effects of their experiments live on through the irradiated individuals that survived and through their descendants. The 1953 *American Naturalist* article reported increases in mutation rate and in chromosome damage in plants in the Brookhaven irradiated field. Genetic damage is seldom described in the reports of irradiated ecosystems, but such damage must have occurred.

Researchers reported their ecosystem experiments in the open literature. In addition to *The American Naturalist* our sources include the periodicals *Radiation Biology* and the *Canadian Journal of Botany* and an unclassified government document (Conf 670503), all available in university libraries. Apparently scientists were confident that society would condone radiation experiments on ecosystems, if not on humans. **WERF**

Mary Davis is a freelance editor and associate editor of *Wild Earth*. She recently co-authored a study on the impacts of French nuclear weapons production on mainland France. She can be contacted through the WE office or her home (213 Westmoreland Court, Georgetown, KY 40324) where references for this article can be obtained.

The Last Trace

Back-lit by the last
trace, these poplars
retire their colors,

huddle closely, their shadows
merging, like men on the verge
of death; their branches shudder

together....they forget whose
seeds are whose. One falls a-
head of the rest with the rest

to follow—they will
not sleep. The moon
emerges, yanks them

up from the place they were
planted; the earth wants it to
happen—we have forgotten:

our rotten trunks totter all
night, while the sun blinds
us on our climb toward light.

Held back no longer,
the poplars surrender.
I remember crying

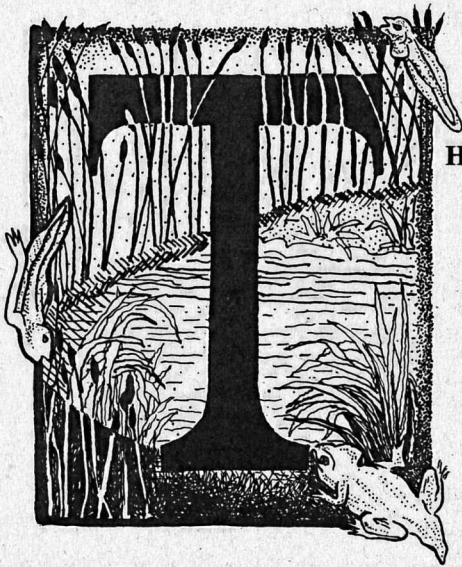
at the first loss of
light; now I cannot
help but laugh at it.

—Ted Olson
POB 5546, University, MS 38677

Saving Aquatic Biodiversity

by Allen Cooperrider and Reed Noss

Editor's note: The following is taken from the aquatic ecosystems chapter of Saving Nature's Legacy—Protecting and Restoring Biodiversity, by Reed Noss and Allen Cooperrider; Defenders of Wildlife; to be published by Island Press (Box 7, Covelo, CA 95428; 800-828-1302) in 1994. This book will be fundamental reading for wildland proponents. These excerpts are pre-printed with the authors' and publisher's permission. Citations are deleted here but extensive in the full chapter. Get the book. —JD



THREATS TO AQUATIC BIODIVERSITY

The threats to aquatic biodiversity are as numerous and complex as the waters and ecosystems. In their attempt to modify aquatic systems, people have ignored Commoner's Third Law of Ecology, "Nature knows best." Intricate river and lake ecosystems that have evolved over thousands of years have been remade or drastically modified in a few years or decades. But, of course, we have paid the price, for as Commoner's Fourth Law states, "There is no such thing as a free lunch."

Three basic categories of human threats to biodiversity have been recognized: (1) resource misuse; (2) pollution; and (3) exotic species. All three are extremely important in aquatic systems.

RESOURCE MISUSE

Dams and diversions. Some of the impacts of damming and diverting waters are obvious and predictable—loss of stream habitat, blockage of fish runs, and loss of downstream nutrients. But we are only beginning to see many of the more subtle and longer term effects. For example, in 1983 selenium poisoning from water diverted for agriculture in California's San Joaquin Valley was found to be killing waterfowl. Selenium, a trace element, is common in western soils including those of the San Joaquin and is toxic at quite low concentrations. When these soils were irrigated, they carried selenium into Kesterson National Wildlife Refuge, managed by the US Fish and Wildlife Service for waterfowl. Over several years selenium accumulated in the reservoir and then caused heavy die-offs of waterfowl.

Thus, not only does diversion of water cause problems in the system from which it is diverted, but it can create damage in its new path. There is indeed no such thing as a free lunch, but the bill for lunch may not come for many years. The selenium poisoning at Kesterson was at first thought to be an isolated and rare problem. Later investigation showed it to be not only a widespread and insidious problem in California, but throughout the West. Moreover, the problem had been identified by government scientists (and ignored by government) over 30 years earlier. A remedy to this disaster and similar problems will require profound changes in powerful institutions—including agriculture, water marketing and water law.

Diversion of water for irrigation also has damaging effects including salinization and waterlogging of soils. Since most farmlands have already been converted from their natural vegetation, their value for conserving biodiversity today is limited. But if their agricultural potential is destroyed by waterlogging and salinization, then the demand may increase for more farmland, which means further pressure on remaining natural areas. Furthermore, salinity problems are not necessarily confined to the farmland itself, as shown by the Kesterson example. One solution to salinity problems is to flush the accumulated salts out of the soil. This flushing water must go somewhere, and it usually ends up adding a lot more salt to the same river from which the water originally was taken. The Colorado River, for example, collects 4.7 million tons of salt in its trip to the Gulf of California, thus having at its mouth a salt concentration of about 900 parts per million—enough to stunt crops and damage plumbing and industrial fixtures.

Dams cause a profusion of problems, from destroying riverine habitat to obstructing movement of aquatic organisms. All can have severe impacts on biodiversity both directly and immediately, but also more subtly due to secondary, tertiary, or cumulative effects. Many of the latter may take years to be noticed: for instance the effects of dams on the big fishes of the Colorado River such as the humpback chub and Colorado squawfish.

Most of the major river systems in the United States have not just a single dam or diversion, but a whole system of them. Thus, the impact is cumulative and complex. Consider the Tennessee River and its tributaries, which drain large areas of Tennessee, Alabama, and Kentucky and portions of other states. Beginning in 1936, this watershed, which contains 32 endemic taxa (mostly mollusks and fish) and 224 native fish, has had 36 multi-purpose dams built on it. Nearly 40 percent of the large waterways have been affected by dams. Or consider the Colorado River, which drains portions of 7 western states and in which 74 percent of the fish are endemic. The dams and diversions on this river allow virtually no water (less than 1 percent of the flow) to reach its mouth. Not surprisingly, both systems have high numbers of extinct and endangered taxa.

Channelization. Many streams and rivers have been channelized (i.e., straightened out, widened or deepened, and typically lined with concrete, boulders, or other retaining materials). Streams are typically channelized to prevent seasonal overbank flooding and to provide drainage to water-saturated soils of a floodplain. These practices essentially destroy functional rivers and associated wetland or riparian vegetation with their high species diversity. In extreme cases, channelization essentially turns natural riverine ecosystems into cement plumbing systems.

Most channelization is done by governmental agencies with taxpayers' money. For example, over about 15 years beginning in the mid-1950s, the US Soil Conservation Service altered more than 8000 miles of channelways of smaller streams not affected by flood regulation activities of the Army Corps of Engineers.

Logging. By removing a substantial portion of the vegetation in a watershed, logging decreases interception and infiltration and increases runoff. With increased surface runoff, erosion increases and more sediment is dumped into stream systems. Furthermore, activities associated with logging such as road building and log skidding greatly increase the sedimentation of streams. Besides contributing sediments from their surfaces, logging roads destabilize slopes, causing landslides and massive deposition of sediments into streams.

Many other effects of logging on watersheds are less clearly defined. One concern is the effect of removing woody debris from river systems. In the natural forest, many trees would fall into streams and decay or be deposited for varying times along the way to the sea. These logs and other woody debris provide important habitat and nutrients for many aquatic and riparian species and influence other riverine processes. For example, stream segments with large woody debris in an Alaskan stream were shown to support 5 to over 50 times the densities of juvenile salmon as logged segments with no large woody debris.

Livestock grazing. As with logging, overgrazing by livestock can affect streams, wetlands, and lakes. A serious impact on watersheds is the effect of cattle on riparian vegetation. Cattle prefer to stay and graze within the riparian zone and can drastically change the species composition of these areas. Over time, with continual grazing, all woody vegetation along the stream may be removed, with consequent lessening of bank stability, increased sedimentation, decreased stream shading, and many other primary and secondary effects such as increased water temperature and over-fertilization.

Roads and urbanization. Another upland activity that can seriously affect aquatic systems is road building and general urban development. Dirt roads, as are built in forestry operations, contribute sediment to streams. Paved roads, on the other hand, may not expose as much dirt, but they essentially reduce infiltration to zero, forcing water to be drained off elsewhere, often with automobile-related pollutants such as lead, oil, and gasoline by-products.

With its massive paving of streets and parking lots, urbanization has similar but greater effects. When periodic heavy rains hit urban areas, houses, pavement, and concrete storm sewers replace the natural systems for deflecting the energy of rainfall (vegetation), for allowing infiltration (soil covered with vegetation), and slowing runoff (small ephemeral streams). Thus, with little to slow it down, rainwater is likely to cause much more severe flooding than would have occurred in the natural system.

Because humans are attracted to water, and rivers have played such important roles in transportation and commerce, human settlements are usually concentrated in and close to riparian zones. This development has degraded one of nature's most sensitive and species-rich ecosystems.

Instream disturbances/extraction. Finally, resource misuse often occurs right in the stream. In the past, and continuing in some areas today, many streams have been severely

damaged by hydraulic mining and other in-stream extraction. Similarly, logging operations such as log-skidding often took place in streambeds. Some great log runs scoured rivers and riparian zones for dozens of miles. Many of these activities have been curtailed or are better regulated, but some continue. Streambeds are often good sources for sand and gravel, which are still extracted directly from streams, causing the loss of these substrates from the stream and substantial disturbance and siltation of water in the process.

POLLUTION

The effects of pollution are often clearly observed—dead fish, sulfurous smelling water, beverage containers, and the extreme case of the Cuyahoga River in Cleveland, Ohio catching on fire. Indeed, much of the awareness and publicity that energized and emerged from the first Earth Day in 1970 dealt with obvious pollution of this sort. However, the causes and effects of pollution are

complex and difficult to sort out. Even though the case for stopping pollution is compelling for reasons of both human and ecosystem health, efforts to date in this country have been inadequate.

The types of pollutants that end up in our rivers are myriad—everything from sewage and garbage to chemical pesticide residues. This complexity makes control and regulation immensely difficult. To compound the problem, it is not always easy to trace the origin of certain pollutants. The easiest sources of pollution to deal with are point-sources—sources that can be traced to a single place such as a factory or a sewage drain entering a river.

Point sources. With the creation of the Environmental Protection Agency in 1970 and passage of the Clean Water Act, standards for “acceptable” levels of effluents have been developed. Enforcement of such standards has been slow, but some progress is being made. However, many waters are still severely degraded, and point source-effluents such



Sarah's trout, watercolor by Bob Ellis

as fecal coliforms from municipal discharge are still a leading source of degradation of rivers in the U.S.

Non-point sources. Non-point pollution sources, particularly agriculture, continue to be the leading cause of degradation of this country's rivers and lakes. The major sources of water-quality problems for aquatic fauna in streams are non-point pollution other than agriculture (38 percent) and agriculture (30 percent).

Garbage/landfills. Of increasing concern are the effects of landfills or garbage dumps on aquatic systems. The traditional method of disposing of garbage was, and still is in many areas, to dump it in unlined, uncapped landfills. Rainwater flowing through such landfills picks up pollutants and toxic chemicals and eventually carries them into aquifers and streams. Years may pass before the effects are noticeable in downstream waters, but by then the problems of clean-up are massive since so much of the underground aquifer has been contaminated. Problems of aquifer pollution occur with other non-point-source pollutants such as gasoline leaking from underground storage tanks.

Mining. Mining threatens biodiversity in many ways. Virtually all mining requires road building, and surface mining destroys the surface flora and fauna. Strip mining may destroy large acreages, and reclamation of mined land is still experimental. Nevertheless, the greatest impact of mining is probably on water resources, not land. Mining requires bringing large amounts of underground material to the earth's surface where it is exposed to rain. This material or ore usually includes high concentrations of carbon and sulfur (coal) or high concentrations of metal ions. When exposed to rainwater, these materials form runoff that is highly acidic or has high concentrations of metal ions. Both are toxic to aquatic organisms.

Furthermore, processing this ore may require washing with water or smelting. Ore processing leaves highly toxic water that must go somewhere, and smelting typically puts pollutants into

the air to be deposited downwind.

Consider, for example, the Silver Bow Creek/Clark Fork River area in Montana, which is the largest of the Environmental Protection Agency's "Superfund" clean-up sites. The Clark Fork Basin was subjected to mining and smelting for more than 100 years and included what was at one time the largest open pit in the world, the Berkeley Pit copper mine. More than 130 miles of the Silver Bow Creek and Clark Fork River have been contaminated with arsenic, lead, zinc, cadmium and other metals, and this contamination has spread to nearby aquifers used for drinking water. Soils throughout the local valley are contaminated with smelter emissions. The Berkeley Pit and a network of underground mines contains more than 11 billion gallons of acid mine water that rises a little higher every year, further threatening local aquifers and the already contaminated rivers.

EXOTICS

The introduction of exotic (non-native) aquatic organisms has been so widespread in North America that few natural communities are not affected by them. Introductions have been of two types: (1) introducing fish or other aquatic organisms from other continents (e.g., introducing carp into midwestern waters); and (2) transplanting fish or other aquatic organisms native to North America from their native region to an area outside that of their historical distribution (e.g., transplanting eastern brook trout into western streams). For convenience, we will refer to the former as "introductions" and the latter as "transplants."

In many cases, the introductions and transplants were done deliberately in a naive effort to somehow "improve" a natural fishery. In other cases, aquatic organisms were transported accidentally in bait buckets, ballast tanks, or other water containers. Whether deliberate or accidental, introductions and transplants have devastated native biodiversity. While practices such as dumping of bait buckets continue to be carried out by un-

informed citizens, it is shocking to note that agencies responsible for fish management still spend huge sums of money releasing exotic sport fishes into natural water bodies.

Although the best data on introduced aquatic species concern fish, other introduced organisms have also created major problems. For example, the opossum shrimp was widely introduced into lakes and reservoirs in the western United States and Canada to improve coldwater fisheries. Unfortunately, this shrimp was able to outcompete gamefish for cladocerans, a group of small aquatic invertebrates, extirpating native *Daphnia* populations and contributing to the collapse of other populations of large cladocerans. When opossum shrimp were introduced into Flathead Lake in Montana, they not only caused the collapse of the fishery but had secondary effects on bald eagles, grizzly bears, and even tourists. In about 1985 the zebra mussel, a filter-feeding Eurasian bivalve, became established in the North American Great Lakes system, probably having been carried there in ballast water. Since then, zebra mussels have spread into all five Great Lakes and many rivers and lakes of the eastern United States, competing with native species for food and space. Zebra mussels are predicted to inhabit eventually most lakes of temperate North America with unknown long-term impacts on community structure and ecosystem function. Similar problems have occurred with aquatic plants, though they have not received as much attention. For example, a major exotic aquatic weed, *Hydrilla verticillata*, has become widely established in US waters, largely from discarded aquarium plants. Finally, introductions and transplants of aquatic or semiaquatic vertebrates other than fish also harm biodiversity. For example, the bullfrog, introduced to much of the West, has proven to be a serious predator on (and sometimes competitor with) native frogs, fish, turtles, and other organisms.

Scope of introductions and transplants. By World War II, 14 species of non-native fish had been established in

North America. Today there are at least 70. In addition, at least 158 and possibly over 200 transplanted fish species have become established.

A significant proportion of the fish of most states now consists of non-natives. Of 108 species of fish now known to exist in Nevada, 63 (58 percent) were introduced. Other states have percentages that range down to 2 percent, with Alaska being the only state lacking established exotic species. On a more local basis, a survey of Cataract Canyon, a portion of the Colorado River running through Canyonlands National Park, found 28 species, of which only 8 were native.

Effects of introductions and transplants. The effects of aquatic introductions and transplants on native species are much the same as with terrestrial organisms and include competition/displacement of natives, predation on native species, disease transmission, and genetic mixing or "swamping."

Displacement of native aquatic species through competition or predation can be quite pronounced. Consider Clear Lake in northern California, one of the oldest large natural lakes in North America. Its original fish fauna consisted of 11 species, of which at least three were endemic. Over the years, 16 fish species were successfully introduced into the lake. Twenty-one fish species now inhabit Clear Lake but six native species were extirpated, including two that are now globally extinct. While stream diversions have contributed to some of Clear Lake's native

species displacement, Courtenay and Moyle concluded that the introduction of large predatory centrarchid fish is the most likely cause of the extinctions.

Diseases from exotic fishes have been implicated in other losses. The exotic red shiner, for example, was introduced from bait buckets into the Virgin River of Arizona, Nevada, and Utah. The red shiner carries an Asiatic tapeworm that has infested the endangered native woundfin and contributed to its decline. The tapeworm originated from another introduced species, the grass carp, which was first introduced into Arkansas.

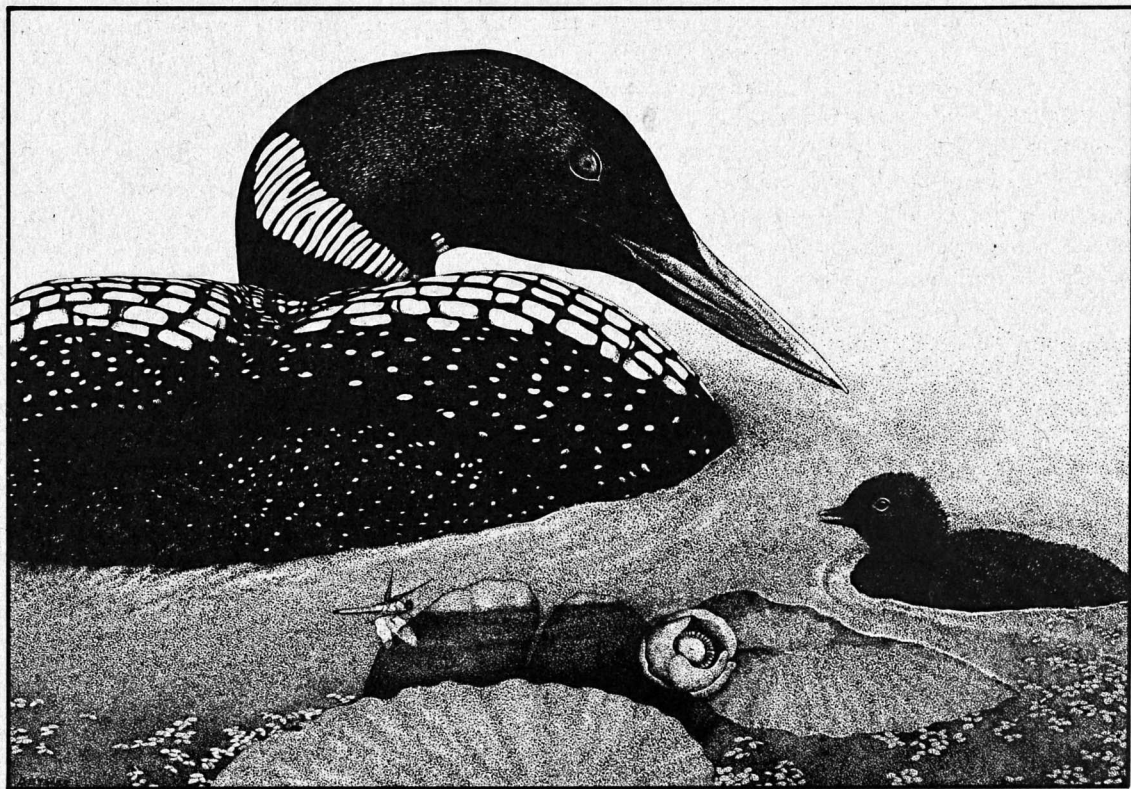
Hybridization, the interbreeding of closely related subspecies, is a major problem in many areas, causing loss of genetic purity and, in some cases, decreased fitness. Courtenay and Moyle suggested that hybridization is rare with introductions but fairly common with transplants. Hybridization may be very gradual and the effects hard to detect, but it can sometimes be rapid. Evidence suggests that hybridization can result in reduced fitness of native species. In the 1980s, the sheepshead minnow was released into the Pecos River, where it be-

gan to hybridize with the endemic Pecos pupfish. Five years later, hybrids could be found along more than 250 miles of the stream. The pure Pecos pupfish essentially no longer exists.

Finally, introduced or transplanted fish can have a substantial impact on other taxa. For example, Wilcove et al. describe growing concern and evidence that introduced game fishes are reducing native amphibian populations in many areas.

Role of fishery management.

Wilcove et al. summarized the conflict between native species and species introduced to enhance sport fishing. As of 1991, the US Fish and Wildlife Service listed 86 species, subspecies, and populations of fish as threatened or endangered. Of these, 44 were threatened to some degree by introduced fishes, and 29 were threatened by species introduced for sport fisheries. These introductions include accidental or deliberate release of bait fish by anglers, but also the deliberate introduction of game fish by fisheries managers. At least one native species, the Miller Lake lamprey, was deliberately poisoned to extinction



© 1984 Diana Dee Tyler

Common Loon (Gavia immer) by D.D. Tyler

by the state of Oregon because it preyed on introduced trout.

Most trout have been moved around so extensively in the West that it is hard to find a stream with only native species. Rainbow trout from the Pacific region have been introduced to the Great Basin and Rocky Mountain region, which had native cutthroat trout. And some cutthroat were moved to the Pacific states. Many local fishes were translocated with little thought to genetic origin or purity. On top of this, brown trout from Europe and brook trout from eastern North America have been transplanted into many western lakes and streams. The result has been many local extirpations and frequent loss of pure strains of trout. Thus five trout populations—Apache, Gila, Greenback cutthroat, Little Kern golden, and Paiute cutthroat—are now protected under the Endangered Species Act. The Alvord cutthroat trout, native to streams of the Great Basin, now is extinct due to introductions of non-native trout.

Fisheries managers have been most adamant about the need for introductions in the case of reservoirs. They insist that such waters are not natural to begin with, thus the argument for avoiding introductions does not apply, and that there is little threat to natives. To some extent the record supports this contention for parts of the country. Many reservoirs have been built in the Southeast, a region with high rainfall and high fish diversity. Riverine species that declined in abundance were replaced by introduced predatory species to enhance sport fishing. Courtenay and Moyle concluded that these introductions into reservoirs in southeastern states apparently affected few native species.

The same practice in the Southwest, however, has had disastrous results for native fish. The Southwest is a region of low rainfall and naturally low species diversity. Reservoir construction on the Colorado and Rio Grande rivers drastically disrupted the life cycles of native fishes. But Minckley suggested that most species would have persisted had exotic predatory species not been introduced.

The combination of dam building and introductions has caused nearly all native fishes in the Colorado River and a rapidly increasing number in the Rio Grande drainage to be threatened or endangered; many are close to extinction.

At least three major arguments can be made for banning exotic introductions and transplants altogether. First, the presence of exotics in a seemingly innocuous situation, such as a reservoir, increases the chance that they will be accidentally or intentionally spread to other areas—the so-called “bait bucket release.”

Second, stocking a reservoir with predatory fish further strengthens the fragmentation of upriver and downriver stream segments. The dam itself blocks travel, and the reservoir creates a stretch of unfavorable habitat for stream fishes. Moreover, the presence of exotic predatory fish in the reservoir can virtually eliminate interchange between upstream and downstream fishes, thus fragmenting populations.

Third, in most situations the problems caused by disease transmission, hybridization, displacement of natives, and other harmful effects of introductions and transplants far outweigh any purported benefits.

CONSERVING BIODIVERSITY IN AQUATIC SYSTEMS

Biodiversity conservation in aquatic systems has not received as much attention as in terrestrial systems until recently. For example, one of the first and most influential books in modern conservation biology, *The Fragmented Forest* by Larry Harris (1984), virtually ignores the aquatic portion of forest landscapes. We (the authors) are terrestrial ecologists by training, and have also been guilty of shortchanging aquatic ecosystems in our writings. Because aquatic systems have received less attention, biodiversity strategies for aquatic systems are just beginning to emerge. We will first look at some of the historical approaches to conservation in aquatic systems and then outline a more comprehensive approach.

Conserving biodiversity in aquatic

systems at the ecosystem or watershed level poses some unique problems. First, these systems are linear and branched, so that the flow of water forms a continuum from headwater to sea (or sink, in the case of landlocked systems). Thus, upstream events such as pulses of pollution can have effects far downstream. Second, few reserves have been designed or designated for aquatic resources, although early designation of federal lands as wilderness areas, national parks, and national monuments often provided fortuitous protection for native fishes. Furthermore, except for a few small coastal watersheds, no river systems exist that have not been severely modified by humans and that might serve as controls or benchmark aquatic systems. Finally, since aquatic systems are inherently connected, it is difficult to establish downstream reserves that are reasonably protected or buffered from both upstream and downstream influences, much less atmospheric influences.

Upon careful scrutiny, problems of conserving biodiversity in aquatic systems parallel in many ways concerns of terrestrial systems. Sheldon and others he cites have shown that species richness of fishes is correlated with drainage area and discharge, both of which can be thought of as surrogates for available stream habitat. Thus, river systems can be thought of as islands, with large river systems having high species richness and small systems having low species richness. This idea suggests that fragmentation of drainage networks will lead to extinctions, and implies that water diversion should also increase aquatic extinction rates by decreasing available stream habitat. Circumstantial evidence supports this assertion, although it is difficult to separate the effects of water diversion (habitat loss) from the physical effects of the dams. The Colorado River, where essentially all water has been diverted and where the existing habitat has been fragmented by a series of dams, has a high proportion of endangered fish taxa. Many other factors, however, have affected the Colorado River fish.

The problems of aquatic reserves

and their surroundings are thus similar to those of terrestrial systems. As noted earlier, most terrestrial reserves were designated and managed for purposes other than conservation of biodiversity, are not large enough to contain viable populations of all native species, and are inadequately buffered from outside influences.

Given the similarity of aquatic and terrestrial conservation problems at the landscape/watershed level, we conclude that many of the principles of landscape design apply to aquatic systems. In general, these principles require zoning the landscape (watershed) into nodes/reserves (areas of concentrated biodiversity), buffers of increasing human uses around such nodes, a well-managed matrix, and corridors between nodes. The main divergence from terrestrial reserve design would be that the buffers and corridors in an aquatic reserve network would essentially be the same and would generally be linear. More progressively, however, the aquatic network must be viewed as inherently imbedded in a matrix of land with which it interacts in complex ways. Thus, aquatic and terrestrial zoning need to be accomplished in an integrated and coordinated way.

We propose twelve principles to guide the development of strategies for conserving biodiversity in riverine systems.

1. Scale. The proper unit for management is the watershed, and because

watersheds are hierarchically ordered, for watersheds within watersheds. Ultimately, strategies must be developed for entire river systems (e.g., the Mississippi River or the Columbia River drainages). These strategies must be general but detailed enough to determine goals and objectives for components such as water quality and discharge from tributaries. To complement these system-wide strategies, lower level strategies must be developed for tributary watersheds in the context of the larger goals and objectives.

2. Baseline. The baseline for management and evaluation of effects on hydrology should be historical flow patterns, including the variance in these flows. Historical flow patterns are the aquatic counterpart of pre-European vegetation dynamics in terrestrial landscapes. To the extent that they can be reconstructed, historical flow patterns provide a useful baseline from which to measure how humans have modified the abiotic portion of the system.

3. Integrated management of land and water. Instream conditions largely result from human activities on land and in riparian and wetland areas. Coordinated planning for land and water resources—or better yet, for interlinked aquatic and terrestrial ecosystems—is an absolute necessity.

4. Reserves and refugia. To conserve biodiversity in riverine systems, a well-dispersed network of reserves or habitat refugia—including headwater watersheds and relatively intact lower-river reaches—should be maintained and restored. That few pristine watersheds remain should not be used as an excuse for not designating areas to serve this function. Naturalness is relative, and many watersheds can be restored.

5. Priorities for reserves. Priority in selecting, designating, and restoring refugia should be given first to areas of high

native species diversity or endemism, or that are of critical importance to the aquatic system, and secondarily to habitat next to such areas.

6. Restoration goals. Restoration should focus on underlying processes, not on cosmetic improvements or halfway technologies. Halfway technologies (including most hatcheries) should be discontinued so that scarce resources can be applied to the root causes of environmental problems.

7. Restoration and “time bombs”. A principal function of restoration should be to proactively defuse existing “time bombs,” areas that, from human activity or neglect, could cause extreme damage to watersheds in the future. Time bombs exist at all scales. At the landscape scale they include watersheds destabilized by logging and contaminated areas such as mined waste areas and Superfund sites. At a smaller scale they include road systems with undersized culverts that will fail with the next large flood.

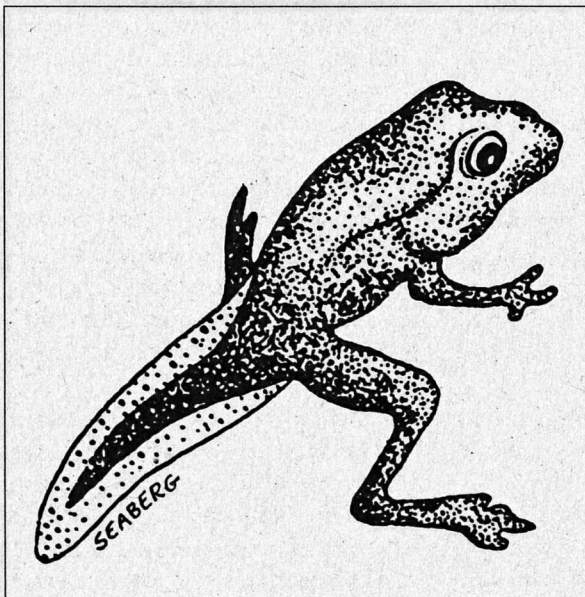
8. Restoration priorities. Priorities should be based on doing the most good for the least investment, with comparisons of cost and benefit made on the appropriate scale. We should not condone setting priorities based simply on cost/benefit ratios of individual projects.

9. Dams and diversions. Dams and diversions are among the major causes of biotic impoverishment in aquatic systems. Conserving biodiversity cannot be effective if new dams are being built. Restoring biodiversity will require removal of existing dams (G.W. Hayduke, personal communication).

10. Exotics. Exotics, including both introductions and transplants, greatly threaten biodiversity in aquatic systems. No new introductions should be allowed in any waters. Established exotics should be controlled or eliminated where possible.

11. Gene and species level programs. Recovery programs dealing with gene and species level problems will be needed to complement watershed level efforts.

12. Information needs. Better information from inventory, monitoring, and research will be needed to restore and conserve aquatic biodiversity.



STRATEGY AND GUIDELINES FOR CONSERVING AQUATIC BIODIVERSITY

The principles listed above provide the basis for the strategy and guidelines described here. We recognize at the outset that we must plan for and manage aquatic systems in an integrated way, guided by top-down watershed level guidance. We also recognize that several promising strategies are already developed or under development. The National Research Council has convened a Committee on Restoration of Aquatic Ecosystems to analyze current efforts and make recommendations. Another effort, called the National River Public Land Development Project, is drafting a proposal for the US Congress, outlining measures needed to protect the health of the nation's riverine ecosystems. A comprehensive strategy for managing habitat of at-risk fish species and stocks in national forests within the range of the northern spotted owl has recently been published. We incorporate elements from these proposals but focus on biodiversity conservation as more broadly defined.

COORDINATED PLANNING AND MANAGEMENT

To counteract the fragmented ap-

proach to managing riverine systems, our planning and management must be integrated. The need for integration has been recognized by groups such as The National Research Council and the Oregon National Rivers Policy Task Force in addition to many scientists and managers. Taking a landscape or watershed perspective will require not only that different agencies work together for common goals, but that scientists and managers from different disciplines cooperate. Goals for major river systems will have to be developed at a national or international level. These goals can in turn provide a framework for developing plans for smaller watersheds.

CLASSIFICATION AND ZONING OF THE LANDSCAPE/WATERSHED

A key element of any workable conservation plan is the zoning of the landscape or watershed according to biological criteria and needs. Frissell proposed a classification of watershed habitats for use in restoration and conservation projects. The classification was developed for anadromous salmonids but has some general applicability, particularly when dealing with large and mobile species that use a variety of habitats in their life cycle.

Based on Frissell's ideas we propose a classification of waters and associated watersheds as follows:

1. Focal or refuge habitats (hereafter called refuges): Areas of high-quality habitat that support a high diversity or high productivity of native species. They are usually relatively undisturbed.
2. Adjunct habitats: Areas adjacent to refugia that have been degraded by human or natural disturbances.

3. Nodal habitats: Areas distant from refuges (upstream or downstream) that serve critical life history functions for aquatic organisms originating in refuges throughout the watershed.
4. Source areas: Watersheds that do not support a high diversity of aquatic life, but are, or could be, stable watersheds in terms of sedimentation. These watersheds provide important sources of high-quality water for downstream refuges or nodal habitats. Source areas will include headwater areas with intermittent streams.
5. Degraded habitats: Heavily disturbed habitats that now support few natives, even though some of them were once the most productive habitats in the riverine system. These habitats include areas with high human population density such as towns and other settlements along rivers. Many of these areas are so degraded that significant recovery within the span of several human generations is unlikely.

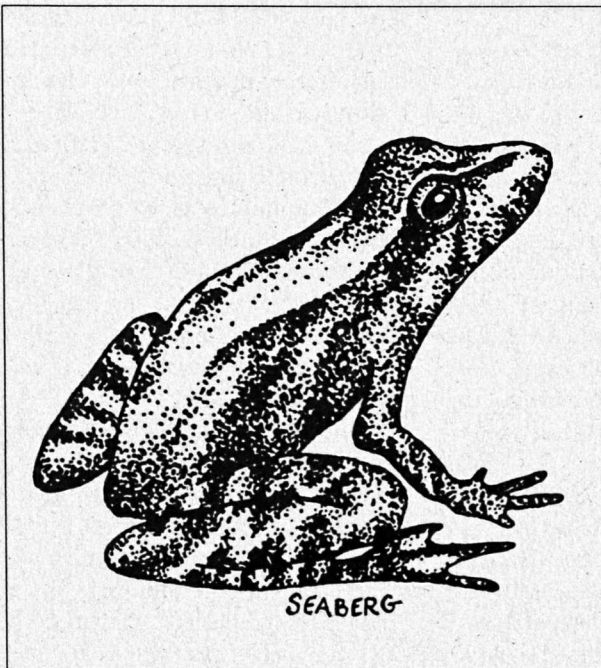
Once a river system has been mapped and classified in such a manner, this information can provide a basis for land-use zoning and restoration priorities. Management is described below under three categories: reserves, multiple-use areas, and restoration.

RESERVE MANAGEMENT

Reserves would be centered on areas where the biotic communities are largely natural and are managed mostly to protect their natural features. Ideally all refuges as described above would be designated and managed as reserves. In addition, portions of adjunct habitat, source areas, or nodal habitat would be designated and protected as reserves. Considerations for reserve design include the need for areas large enough to be protected from edge effects and other external influences, and the need for replication.

Moyle and Sato suggest a three-step process for identification of aquatic preserves:

1. Identify geographic regions for which an aquatic preserve system is desirable.
2. Within each region, identify potential



preserves (waters with the highest percentage of native fishes or other taxa). If this list does not include all native species, then add waters where those taxa occur as potential preserves.

3. Develop a priority list for acquisition and management based on:
 - (a) class of water;
 - (b) presence of intact, native biotic communities;
 - (c) amount of drainage included and other indicators of size;
 - (d) protection against external, edge, and boundary effects;
 - (e) ability to support minimum viable populations of large or otherwise important species;
 - (f) redundancy as a positive feature;
 - (g) difficulty of management;
 - (h) presence of rare or endangered species; and
 - (i) economic considerations.

Various categories of reserves and buffer zones can be designated that allow increasing human uses moving away from the center of core reserves. One of the key management issues in need of resolution is the degree to which fishing should be restricted. While limitation of hunting has been a common practice in terrestrial reserves, fishing has rarely been excluded from any aquatic system, freshwater or marine. Even national parks, which have a long history of excluding hunting, have traditionally allowed fishing. Yet if an aquatic reserve system is to conserve biodiversity and provide benchmarks for comparison with exploited areas, core areas will need to be closed to fishing, for the same reasons that core areas of terrestrial reserves are closed to hunting. Moving away from core areas, flexible and innovative ways of limiting fishing impact, such as catch-and-release buffer areas, may be used.

Ideally reserves would be large enough to include year-round habitat for all species. This objective can be achieved in aquatic systems in which most of the biota can obtain all life history functions within reasonably small geographic areas. For example, isolated populations of desert pupfish and en-

demid headwater trout populations can be encompassed in single reserves.

However, the single-reserve approach is of limited use in dealing with wide-ranging species such as salmon or the big river fishes of the Colorado River system. Reserves in this context must be for particular life history functions of one or more species, such as spawning areas, and a network such as Frissell proposed will be more suitable. Two-tiered management of this sort is analogous to management in terrestrial systems. Terrestrial managers often rely on preservation of blocks of habitat, carefully chosen and large enough to conserve nonmigratory species with narrow niches or small home ranges. This approach works for most small mammals, many birds, and a variety of plants and invertebrates. However, for larger or migratory species such as bears, elk, or whooping cranes, management must select and protect reserves for several critical life history functions (nesting areas, wintering areas, seasonal foraging areas, migratory staging areas, etc.).

MULTIPLE-USE MANAGEMENT

Multiple-use waters and watersheds will continue to be all those not designated as reserves or buffer areas. Although most of these waters and watersheds are degraded to some degree, they still have important ecological functions. For migratory or anadromous species, these areas must provide habitat for passage without excessive mortality. Furthermore, most activities in these areas will affect other portions of the aquatic system, particularly downriver. Since these areas include such a wide variety of watershed types, and so many kinds of land and water ownership, we cannot make specific or comprehensive recommendations here. But we list a few guidelines:

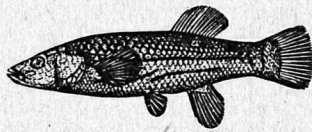
1. **Zoning.** Source areas and nodal habitats should be zoned to exclude incompatible human activities. For example, if a source area is a relatively intact forested watershed that contributes clean water to the system, then uses such

as logging, grazing, and off-road vehicles should be excluded while camping, hunting, fishing, and hiking could be allowed. The same sort of limited human uses would apply to nodal habitats.

2. **Historic flows.** Historic flows should be maintained or mimicked to the greatest extent possible. Multiple-use areas are normally where watersheds have deteriorated and dams have been built. Thus, a return to historic flow patterns may be unattainable in the short term. Nevertheless, in many cases, with modest efforts or purchase of minimal water rights, flows that approach historic patterns can be approximated. One of us observed water management on the Cache la Poudre River in Colorado for over 10 years. As is typical in Rocky Mountain streams, water managers for the Cache la Poudre virtually shut off downstream flows in fall once the irrigation season is over. This is a period when water flow is normally low and little water is collected in reservoirs. It is also a stressful period for aquatic organisms because the habitat has contracted. Thus, shutting off flow at this time worsens the stress but gathers little water for people. Most of the runoff comes in spring with snowmelt, and water managers, having spent all winter trying to slowly fill reservoirs, are often forced to release large amounts during peak runoff. With more enlightened management a mid-winter flow that approximated historic levels could be released at relatively minimal cost but with great benefit to the biotic community.

3. **Pollution.** Excessive pollution or developing "time bombs" for future disaster should be proscribed. In the United States, the federal anti-pollution laws address this issue fairly well. But enforcement needs to be expanded and penalties stiffened.

4. **Floodplain development.** New floodplain development should be prohibited and existing structures removed following catastrophic floods. Development of subdivisions and other human structures in floodplains is a longstanding problem for human health and safety and biotic integrity.



Groups Defending Aquatic Ecosystems

A number of environmental groups are involved in freshwater ecosystem protection and restoration. Local river watch organizations are far too numerous to be listed here; however, we have included an overview of the major North American and national organizations.

The Desert Fishes Council, an international interdisciplinary organization comprised of approximately 500 governmental agency resource managers, university research scientists, and members of the private conservation sector, is dedicated to the protection and preservation of North America's desert aquatic ecosystems and their associated life forms. The Council meets annually (every third year in Mexico) and produces proceedings of the annual symposium. Membership is open to the general public. For information contact Phil Pister, Executive Secretary, P.O. Box 337, Bishop, CA 93515, (619)872-8751 (FAX and voice phone).

Superior Wilderness Action Network (SWAN) coordinates wildland protection efforts by scientists, environmentalists, legal experts, and economists. SWAN is producing a scientifically guided proposal for a biodiversity reserve system in the upper Great Lakes Bioregion to fully represent in protected areas the region's native (pre-Colombian) biodiversity across all ecosystem types.

International Rivers Network (IRN), an affiliate organization of Friends of the Earth International, is active throughout the world helping local people fight to save rivers. IRN challenges large dam projects and attempts to influence dam building professionals, partly through its journal, *World Rivers Review*. For more information contact: IRN, 1147 Berkeley way, Berkeley, CA. 94703; (510) 848-1155; Econet: irn.

American Rivers (801 Pennsylvania Ave. S.E., Suite 400, Washington DC., 20003; (202) 547-6900; FAX: (202) 543-6142.) is one of the nation's largest river conservation organizations. Founded by an independent group of environmentalists and citizen activists in 1973, this non-profit organization has helped protect 20,000 miles of outstanding rivers and five million acres of riverside land in the United States and Canada. American Rivers is working in six program areas in river conservation: "the protection of America's most magnificent remaining wild

ivers; the reform of hydropower policies for dam building and their operations; the protection and restoration of endangered fisheries, aquatic habitat, and natural flood plains; the reform of policies that "dewater" the rivers and streams of the American West; the clean-up of rivers and protection of safe drinking water supplies; and the restoration of long-neglected rivers in metropolitan areas."

Another group working to enact new policies to protect healthy river habitats and watersheds in North America is the **Pacific Rivers Council**. In 1988 this group crafted and secured congressional passage of the Oregon Omnibus Wild and Scenic Rivers Act, which protects forty river segments totaling 5000 miles. The Pacific Rivers Council is working to develop restorative techniques for damaged rivers and has proposed to Congress a program to restore the basic ecological processes of entire watersheds on federal land in Washington, Oregon, and northern California. Current programs include Pacific Northwest Watershed and Salmon Habitat Restoration, Knowles Creek Model Restoration Project (a strategy to restore stream function and aquatic habitat based on the successful model developed at Knowles Creek), and the Communities and Rivers Program (to integrate watershed restoration and community development). For more information call (503) 345-0119 or write: PRC, P.O. Box 10798 Eugene, Oregon 97440; FAX: (503) 345-0710.

Wetlands for the Americas works throughout the hemisphere for the preservation of wetlands in three ways: The Western Hemisphere Shorebird Reserve Network (WHSRN) conserves shorebird species by bringing international attention to areas of high shorebird concentration. The network now protects over four million acres of wetlands, providing habitat for 30 million shorebirds on 24 sites in seven countries. In the US and Canada, Wetlands for the Americas is applying its expertise in shorebird management to assist wetland conservation programs for non-game wildlife. In South America, the network is working to increase awareness of the social and economic importance of wetlands and develop priorities for wetlands conservation. Write Wetlands for the Americas, POB 1770, Manomet, MA 02345.

—Peter Achenbach, *WE intern*

5. Dams and diversions. No new dams or diversions should be built, and existing dams should be removed over time. Evidence is adequate to conclude that in the long term most dams seriously harm river ecosystems. Although, in general, small diversions, carefully located, designed, and constructed, may pose little threat to biodiversity, dams generally were a mistake. We must face this reality and begin to develop a program for phasing out most existing dams and restoring natural flow patterns. The National River Public Land Development Project is preparing guidelines for meeting such a goal.

6. Exotics. No exotics should be introduced into any waters and existing nonnative species should be eliminated where possible. Our only caveat is that exotics should be eliminated with great caution. The historic way to eliminate nonnative fish is by poisoning lakes or stream segments with rotenone. This kind of action should not be taken unless biologists can confirm that native fauna such as mollusks or other gill-bearing invertebrates will not be harmed.

RESTORATION

Restoration of aquatic systems is still highly experimental and can be extremely costly. Priorities for restoration must be carefully set and we must learn as much as possible from our experiments. Chapter 9 discusses adaptive management—the approach of combining management or human intervention (restoration in this case) with research and monitoring.

The record clearly shows that past restoration has been piecemeal and cosmetic rather than coordinated and designed to curtail underlying causes. The National Research Council has comprehensively reviewed restoration projects; one should refer to that publication to learn what has worked in lakes, rivers and streams, and wetlands.

In planning restoration projects, we suggest six guidelines, most of which have been discussed or follow directly from the principles offered earlier. But they are so critical and so often ignored

that we reiterate them here.

1. Priorities. Priority for restoration should go to areas of high species richness or high native species productivity. In the past much effort has gone into areas that Frissell described as lost causes. Projects on lost cause areas may seem to have high benefit-cost ratios if the economic analysis is limited in scale and looks at local projects in isolation from the larger aquatic ecosystem. From a broader perspective, however, these projects are often not worthwhile.

2. Natural functions. Restoration should be designed to restore natural functions of aquatic systems. If used at all, structural or other high-technology approaches should be only temporary measures to speed rehabilitation while underlying causes are being remedied. Thus, the Dexter National Fish Hatchery in New Mexico, where endangered desert fishes are reared and maintained, serves a critical function while native habitat is being identified and restored. On the other hand, we cannot justify substituting salmon hatcheries for native stocks whose habitat has been and is still being destroyed by human activity.

3. Time bombs. A high priority should be given to restoring time-bomb areas that may cause disasters in the future. Toxic waste dumps and destabilized watersheds can cause major problems. Restoration of such areas is often delayed until it is too late because they are perceived as posing little immediate threat.

4. Determining costs and benefits. Priorities for restoration should be based on cost/benefit or other economic and ecological analyses at the appropriate scale. We recognize that social and political forces will affect priorities. Priorities are often determined largely by administrative boundaries, public relations considerations, or other factors unrelated to biology. In addition, analyzing benefits and costs at too small a scale (the project rather than the watershed, for example) may result in less effective programs. The effectiveness (benefits) of several projects may be linked, so that doing one project without another might be of limited value.

5. Work from headwaters down. Riverine systems are inherently connected and unrestored headwaters may prevent restoration farther downstream.

6. Caution. Large-scale restoration without knowledge of what works best should be avoided. Little is known about the effects of active restoration techniques for aquatic or any other systems; we may do more harm than good when intervening in natural recovery processes. Allowing natural processes to accomplish restoration is often safer than drastic human intervention. If great uncertainty exists, smaller pilot efforts should be preferred over large-scale experiments.

The emphasis in this book on landscape/watershed/ecosystem level management does not mean that species-oriented programs should be dropped. They will continue to be an important part of aquatic system management. And of course, biologists need to be concerned with genetic conservation to provide for long-term adaptability of populations and evolution.

Reintroductions of endangered fishes back into native habitats are important programs. Yet, if not done properly, reintroduction can have negative effects. In at least one instance, a reintroduced fish eliminated a population of another rare native organism. The American Fisheries Society has developed and adopted guidelines for reintroductions, including genetic considerations, and these should be followed in conducting such operations.

Allen Cooperrider is a consultant in conservation biology with Big River Association. He has worked as a wildlife biologist throughout the West, including seventeen years with the BLM.

Reed Noss is Editor of Conservation Biology, Science Director of The Wildlands Project, and Science Editor of Wild Earth. His skills as an editor and ecologist are not to be gainsaid; he has a black belt in karate.

Report from Neptune's Navy

by Captain Paul Watson

Fifteen years ago, I aimed the prow of the *Sea Shepherd* at the pirate whaler *Sierra*. We rammed her and later sunk her in the waters of Portugal, ending her ruthless career forever.

Since that day in July 1979, I have taken the helm of four other environmental warships, the *Sea Shepherd II*, the *Divine Wind*, the *Edward Abbey* and the *Cleveland Amory*. Exercising caution, nautical skills, non-violent aggressiveness and the legal high ground, the Sea Shepherd Conservation Society has championed the citizens of the sea around the globe, protecting the whales, dolphins, seals, sea turtles, sea birds and fish.

Although we have not caused a single injury, we have been less than gentle with those who illegally plunder the oceans. We have directly sunk six whaling ships and one drift-netter, one in Portugal, two in Iceland, two in Spain, one in Norway and the drift-netter in Taiwan. We ended the career of three other whalers, forcing the retirement of one in the Canary Islands and persuading the South African government to seize and sink the two others.

We have rammed and disabled one whaler, four drift-netters and one tuna seiner. We have boarded two tuna seiners and chased four others away from dolphin pods. We have driven dolphin and shark poachers from a Costa Rican wildlife sanctuary and we have driven Cuban and Spanish druggers off the Newfoundland Grand Banks to protect the endangered Northern Cod.

The Sea Shepherd Conservation Society has confiscated or destroyed more than a hundred miles of Japanese monofilament drift net. We ended the seal hunts in the Irish Sea and the Orkney Islands and we blockaded the Canadian sealing fleet in harbour for two weeks to prevent the killing of 76,000 Harp Seal pups. In 1981, we landed in Soviet Siberia to expose illegal Soviet whaling activities.

Our efforts have provoked high seas confrontations with the Soviet Navy, the Canadian Coast Guard, and the navies of Norway, Denmark, Iceland, Portugal, and the Faeroe Islands. We have been shot at, rammed, gassed, boarded, arrested and beaten by authorities. Yet we have never had a crew member convicted of a criminal offense.

Most important, we have directly saved the lives of thousands of whales, tens of thousands of dolphins, hundreds of thousands of seals, and millions of fish and other aquatic species.

We accomplished all this without employing a bureaucracy, without junk mail solicitation, without door to door begging, and with an all-volunteer crew. For fifteen years, the Sea Shepherd Conservation Society has been the only organization policing the high seas in defense of marine wildlife. Lean and mean, the Society has grown slowly but now has some 25,000 supporting members, all of whom are treated with respect, their questions answered, their contributions personally acknowledged by me or my crew.

Purity



Our influence has gone beyond enforcement of conservation laws and treaties. Over the years, we have proven ourselves as an effective educational organization. Our high seas campaigns have catapulted out of sight issues into the living rooms of hundreds of millions of people worldwide, turning ignorance into controversy and controversy into political action. Thus our campaigns have contributed greatly to the United Nations ban on drift nets, the decision by the European Common Market to prohibit imports of seal pelts, and the California initiative to ban gill nets which took effect on 1 January 1994.

Because we do not participate in standard self hype programs like direct mail, the Sea Shepherd Conservation Society is less well known to the public than are many other groups. However, we are the best known and most feared organization among the whalers of Iceland, Norway, Denmark and Japan. They know our name in Kaohsiung, Taiwan, in the Lofoten Islands of Norway. The Newfoundland sealers and the Bering Sea druggers know who we are.

The former First Mate of the *Sierra*, Knut Hustvedt was interviewed in the early eighties by NBC. He was asked what he thought of his ship being rammed by the *Sea Shepherd*. He answered, "it was the only way that we could have been stopped." The reporter pressed Knut, hoping for a condemnation of Sea Shepherd. She asked him how he felt to have his livelihood taken away. He answered without anger, "I never thought much about whales, they were just big fish. We killed them and we made money, a lot of money. However, when I saw these people take such risks to protect whales and for no profit, I began to question what I was doing. I will never kill a whale again and if Sea Shepherd wanted me to volunteer for her crew, I would do so readily."

To convince a hundred million Americans to not kill whales is no great achievement because they will never kill a whale anyway. To convince one Norwegian whaler to retire his harpoon and to become a whale saver is a major educational achievement.

Sea Shepherd has developed imaginative strategies and tactics to be effective within the international media culture. Our approaches have guaranteed maximum media coverage and direct physical results.

Sea Shepherd was the first organization to take a ship into the ice fields to save seals, the first to paint seals with a dye to spoil the economic value of their pelts, the first to invade the Soviet Union to gather evidence, the first to film and expose the killing of dolphins by tuna fishermen, and the first to interfere with the slaughter of Pilot Whales in the Faeroe Islands of the North Atlantic. We have also been the only organization to ram and sink whaling ships, to confiscate drift nets, and to ram drift-netters.

This year, however, marks a new era for the Sea Shepherd Conservation Society. This year we launch the *Nautilus*, the world's first marine conservation submarine.

The *Nautilus* will incorporate all the modern myths of submarining. Named after Captain Nemo's valiant vessel in

Jules Verne's classic novel and painted after the Beatles' classic tune, the *Yellow Submarine* will be a media magnet, automatically attracting worldwide attention to an issue just by showing up.

Additionally, the submarine will give us an awesome field tactical advantage. The vessel is three hundred feet long with the capability of diving to a thousand feet and traveling at 17 knots beneath the surface. The boat will save us money on fuel because it can be run 40% of the time on battery power. Imagine the looks on the faces of the crew of a whaling ship when a large yellow submarine hurtles from the depths directly between them and their helpless prey.

The submarine will also enable us to monitor poaching activities and to covertly dispatch divers through our torpedo tubes. Although we will not carry torpedoes or firepower, we will have our defensive pie filling cannons and stink bomb canisters.

On the legal front, too, the Sea Shepherd Conservation Society has several irons in the fire. On March 21, I must stand trial in St. John's, Newfoundland on four charges of criminal mischief for ordering a Cuban trawler off the Grand Banks in July 1993. Three of the counts carry life terms and the fourth count carries a ten year sentence. The charges are plainly political. The arrest took place outside of Canada's territorial waters and our actions did not damage any property or endanger any lives. However, pressure from Norway, Japan and Iceland, along with pressure from the Canadian Department of Fisheries, has led to the Royal Canadian Mounted Police pulling out all stops in an attempt to get a conviction. I certainly have the evidence to mount a strong and effective defense; but the government can outspend me: They have 27 million Canadian taxpayers to finance their political harassment.

The government was angered even more in October 1993 when the Sea Shepherd Conservation Society won a civil suit against the Canadian Government for causing damage to our ship during a 1983 confrontation where we interfered with the Canadian sealing fleets.

Meanwhile, the government of Norway is still whining about the Sea Shepherd raid the day after Christmas 1992, when we scuttled the outlaw whaler *Nybraena*. The Norwegian government has publicly stated that charges have been laid against us for sabotaging the ship, yet the Norwegian police will not confirm these charges. All Sea Shepherd agents must answer to charges for our actions. Norway apparently wishes to have the public perceive that we are criminals but has no desire to see this case brought before their courts.

Behind all its complaints of Sea Shepherd illegality lies the stark truth that Norway has been in blatant violation of whale conservation regulations established by the International Whaling Commission. Norwegian whaling is in conflict with the United States Packwood-Magnusson Amendment and the Pelly Amendment prohibiting U.S. importation of fish products from any nation certified as being involved with illegal whaling activities. Yet, instead of sanctioning Norway, Presi-

dent Bill Clinton assured Norwegian Prime Minister Gro Harlem Brundtland on 4 October 1993 that the United States would not enforce its laws against Norway. Iceland announced a few days later that its fleet would resume commercial whaling in 1994.

IRVING

President Clinton's betrayal of the whales means that the Save the Whale movement has been sunk. Clinton and Gore have overturned the progress made over the last two decades. Japan is escalating whaling activities; and Russia, Chile and Peru are preparing to return to this barbaric industry.

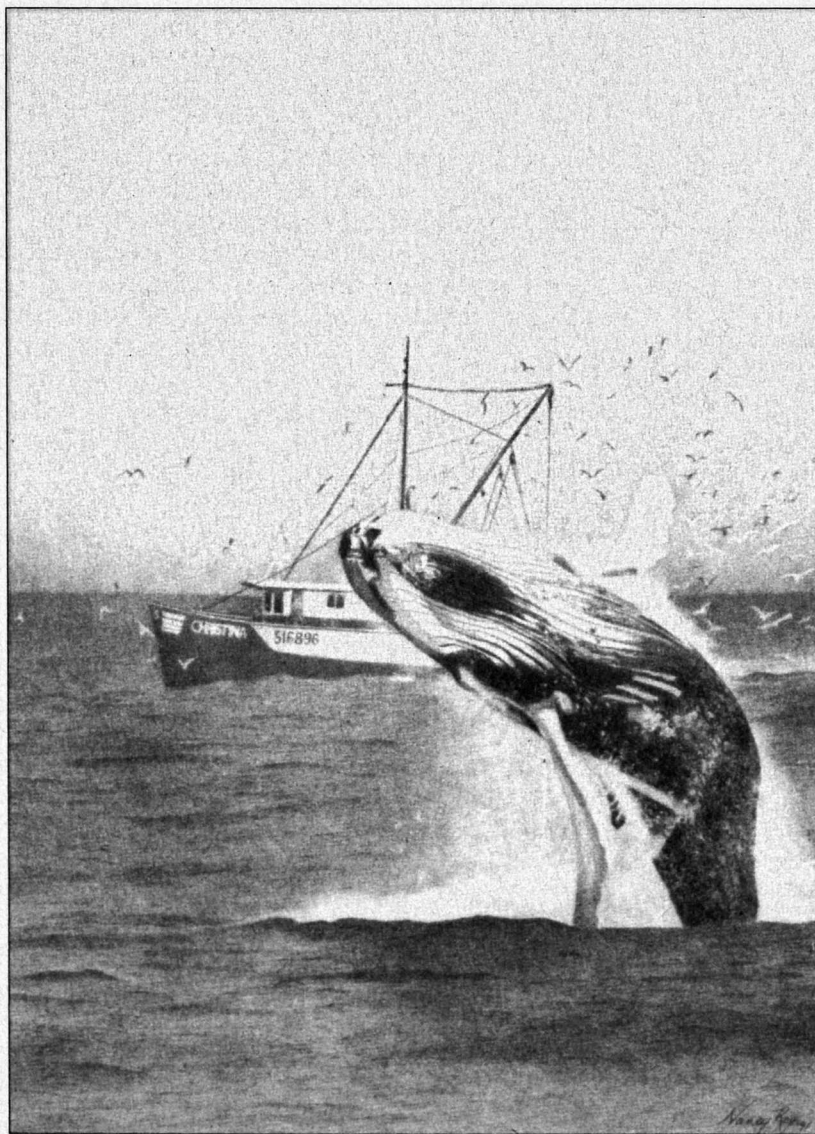
Now more than ever, the whales need an aggressive force to protect them on the high seas. With the *Nautilus*, the Sea Shepherd Conservation Society will be prepared to seriously challenge the whale killers in the summer of 1994.

The oceans of the world remain a lawless frontier. The systematic rape of the seas continues unabated with little motivation on the part of any government for enforcement. The United States could have ended worldwide whaling once and for all with sanctions. However, the President simply sold out the whales in the interest of Norwegian/American trade relations.

Despite international treaties, the Taiwanese continue to drift net, and every coastal nation continues to over-fish. Most continue to use the oceans as a toxic waste dump.

Sea Shepherd fills the vacuum of law enforcement on the high seas. We are not a protest group; we are a policing agency.

The Sea Shepherd Conservation Society is Neptune's Navy. We are the only navy the citizens of the oceans have. We are always looking for recruits. If you'd like information on volunteering for duty at sea, or to support Sea Shepherd efforts financially, write: Sea Shepherd Conservation Society, 1314 2nd Street, Santa Monica, CA 90401. **WERE**



Editor's note: Readers who like the ocean will want to read Sea Shepherd Log, newsletter of the Sea Shepherd Conservation Society. Send as much money as you can afford, then add a few dollars for the Second Quarter 1993 issue. Read therein Paul Watson's devastating indictment of the commercial fishing industry. —JD



THE WILDERNESS LAND TRUST

Safeguarding Wilderness Inholdings

by Mark Pearson

Imagine the tranquility of your wilderness visit suddenly shattered by the “thwock-thwock-thwock” of a helicopter ferrying well-heeled guests to an exclusive lodge located high atop a wilderness ridgeline. Or consider the fragmentation of an ecosystem accompanying the permanent human habitation of an otherwise wild watershed. Or envision the gaping scar of a 472-acre marble quarry on the steep slopes of a wilderness valley.

Unfortunately, none of these scenarios is hypothetical. All are real-life proposals for private parcels located within Colorado Wilderness Areas. The threat of this sort of inappropriate development within Wilderness led to the creation of the Wilderness Land Trust in February 1992. The Wilderness Land Trust is a new national organization whose self-appointed task is the acquisition of private wilderness inholdings so as to prevent their development and the subsequent degradation of wilderness resources. By operating in the private marketplace, the Wilderness Land Trust can quickly take advantage of purchase opportunities. Federal land management agencies enthusiastically support acquisition of these inholdings, but federal action is hampered by lack of personnel and the cumbersome federal budget process which hampers agencies' ability to seize unexpected opportunities.

Approximately 450,000 acres of non-federal lands dot the Forest Service's 34 million acres of designated Wilderness in the coterminous 48 states, although about one-half of this is state-owned forest lands and lake beds in the Boundary Waters Canoe Area Wilderness in Minnesota. Outside of Minnesota, the single greatest concentration (60,000 acres) occurs in California where in many Wilderness Areas railroad lands are intermingled with federal lands. Over 10,000 acres of inholdings dot Colorado's 3.3 million acres of Wilderness, mostly in the form of patented mining claims. Dozens of inholdings, many of them old homesteads, lie scattered throughout the large Wilderness Areas of the Northern Rockies such as the Frank Church-River of No Return. These examples point out the source of the inholding problem: the legacy of America's 19th-century land disposal laws. To promote development of the West, the government granted large tracts to railroads and states, gave homesteads to anyone willing to attempt to settle, and offered cheap land to miners looking for the mother lode. The consequence for wilderness management today is a hodgepodge of land ownership where development of far-flung private parcels threatens wilderness integrity.

The Wilderness Act defines wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” It further elaborates that wilderness is free from any permanent human habitation. The lure of rural lifestyles and development of all-season resorts in close proximity to our nation's wilderness has led to a market for wilderness hideaways. In many places, one can acquire a 10-acre patented claim on the shore of a wilderness lake or in a secluded alpine valley for a pittance (\$10,000) just a few

short miles from world-famous resorts such as Aspen, Vail, and Telluride. Many Americans can easily afford the additional \$50,000 or \$100,000 it may take to transport materials via helicopter or horseback to build a small cabin, and presto!, a heretofore undeveloped valley is now permanently inhabited throughout the summer and fall. This was exactly the situation when a Chicago surgeon purchased the Aurora claim in the Holy Cross Wilderness at Turquoise Lakes, a few miles south of Beaver Creek resort. And in a now infamous case, a Paonia, Colorado realtor purchased a 240-acre inholding in the West Elk Wilderness, ferried in by helicopter materials for a 3500-square-foot "cabin," then held the Forest Service and the public hostage until his terms for a land exchange near Telluride were accepted.

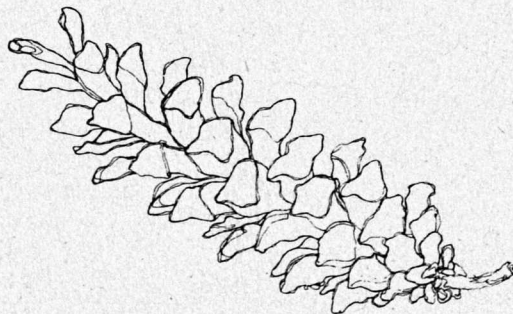
The acquisition of these inholdings has been slow for several reasons. Many of the inholdings are small and inexpensive, a fact you might think would argue for their swift acquisition. But in practice, land exchange proponents looking for a half-million dollars or more of private property to trade for some desired Forest Service land find it much easier to buy a single high-priced parcel somewhere in the National Forests rather than attempt to cobble together several dozen Wilderness inholdings from a passel of widely scattered owners. Similarly, it makes little sense to lobby Congress through the federal appropriations process for a \$5000 line item to buy a single Wilderness inholding when it takes the same effort to garner support for a million-dollar appropriation. So in many respects, the inexpense and ease of buying small Wilderness inholdings has conspired against their acquisition in today's high stakes federal land exchange and land acquisition programs.

The Forest Service has occasionally been able to buy an inholding here and there, but it is frequently caught in a catch-22 situation where it can't sign a purchase contract without the money in its budget, but can't get budgeted money without a firm commitment to sell from the owner. The Wilderness Land Trust was formed to get around these sorts of problems. The Trust has secured sources of capital that allow immediate purchase of inholdings at market prices and is then able to hold the lands until the Forest Service can round up the money to purchase them from the Trust. For example, the Colorado Mountain Club's foundation generously loaned the Wilderness Land Trust \$20,000 to buy six parcels on La Plata Peak in the Collegiate Peaks Wilderness and in Chicago Basin in the Weminuche Wilderness. The work of the Wilderness Land Trust (WLT) most obviously includes buying private inholdings. To date, the WLT has purchased over 2000 acres in existing and proposed Colorado Wilderness Areas: 200 acres in the Indian Peaks, west of Boulder; 50 acres of prime residential sites in the East Maroon and Conundrum valleys of the Maroon Bells-Snowmass; 125 acres of alpine valleys and lakes in the Weminuche; and more than 200 acres in the Holy Cross. The largest single transaction to date is a contract for 1280 acres in the James Peak roadless area, contiguous and south of the Indian Peaks Wilderness.

The other major thrust of the WLT is ensuring that the Forest Service and other federal agencies have adequate resources to acquire these inholdings once purchased by the WLT. Congressman David Skaggs (D-CO) has been a particularly ardent congressional champion of this program. From his position on the key House appropriations committee, Congressman Skaggs has successfully lobbied for federal appropriations from the Land and Water Conservation Fund for the specific purpose of acquiring Wilderness inholdings. In 1994, Congress approved a \$1.25-million line item for acquisition of Colorado National Forest Wilderness inholdings.

Activities have focused on Colorado to date for several reasons. Colorado has the most severe problem, with countless patented mining claims in over a dozen Wilderness Areas combined with a booming resort economy. The WLT was formed in Colorado, and as noted above, Colorado Representative David Skaggs has been a key congressional supporter. Now that the WLT has gained its organizational feet, the objective is to expand efforts to other states. For example, in the last few years, Congress has enacted more than one million acres of Bureau of Land Management Wilderness in Arizona, which includes about 7500 acres of private inholdings, and the Arizona BLM folks are enthusiastic about moving quickly to acquire these inholdings. In the Northwest, Oregon and Washington both possess significant Wilderness inholdings. The abundance of inholdings in these two states, combined with congressional delegations with seats on strategic appropriations committees, makes the Northwest fertile ground for additional efforts. **WERF**

Mark Pearson is Vice President of the Wilderness Land Trust. The Trust can be reached at its main office at 1101 Village Road #2A, Carbondale, CO 81623 (303) 963-9688 or at 560 Clearview Road, Durango, CO 81301 (303) 259-6181.



Small Potatoes

Curricular Reform from the Ground Up

by Scott M. Lewis, Lee H. Metzgar

In June 1992, twenty-six secondary biology, mathematics, history and English teachers from across the country met for four weeks at the University of Montana, to participate in an interdisciplinary workshop funded by the National Science Foundation. The 1992-94 Conservation Biology Workshop consists of a series of lectures, seminars, and field sessions designed to aid in the establishment of curriculum projects on the local level and to promote communication between teachers of science, mathematics, and the humanities. Participants study conservation biology and related educational and ethical topics. In this article, we will briefly describe the rationale behind and goals of the workshop.

THE IMPORTANCE OF LOCALLY OWNED CURRICULA

For curricular reform to be most effective, it must be the property of the people responsible for its implementation. The teachers themselves must have the first and final word when it comes to planning, implementing and evaluating curricular reforms. This does not necessarily exclude administrators, university faculty, and government officials from the process of curricular reform, but the roles of such people should be to make resources available to teachers in the form of time, money, materials, and expertise.

Local ownership of curricular changes gives teachers a vested interest in the changes being implemented. Small-scale projects are easier to modify and promote the natural diversity between regions in our country.

One of the difficulties of the small-scale approach to curricular reform is the communication problem. Without access to each other, local teachers may have to solve each new problem from scratch. Also, simply providing teachers with new tools does not guarantee that they will use them or benefit from them. It can be lonely out there. Preference for participation in the workshop is thus given to teams of teachers representing a variety of disciplines in a single school district.

RATIONALE OF THE WORKSHOP

The workshop is designed to foster changes in science, mathematics, and humanities programs and extracurricular activities, through increased teacher expertise, reinforcement of local efforts, and continuing communication between participants from successive workshops. If successful, this program will bind a growing number of secondary teachers together, committed to using conservation issues as a vehicle for interdisciplinary program improvement.

Editor's note: Several teachers have recently expressed an interest in developing a curriculum around Wild Earth and The Wildlands Project. This article should speed movement in that direction. —JD

Conservation biology unites mathematics, science and immediate human interest in a unique way. According to one of the founders of the Society for Conservation Biology, Michael Soulé:

Conservation Biology, a new stage in the application of science to conservation problems, addresses the biology of species, communities, and ecosystems that are perturbed, either directly or indirectly, by human activities or other agents. Its goal is to provide principles and tools for preserving biological diversity. (Conservation Biology: The Science of Scarcity and Diversity, 1986)

This is, as Soulé says, a crisis discipline, whose relationship to biology resembles that of surgery to physiology or war to political science. It is synthetic, eclectic, multidisciplinary, and timely.

Frederick Turner argues that traditional curriculum structures too often impede understanding:

The last 400 years of scientific progress contains a gigantic paradox. Every profound insight in the sciences and other intellectual disciplines, has torn down the barriers and distinctions between those disciplines; and yet the institutional result of these achievements has been the further fragmentation and specialization of the academy. (Natural Classicism, 1985)

Spanish philosopher José Ortega Y Gasset decries "the barbarism of specialization," a process that ultimately produces citizens—barbarians—"more learned than ever before, but at the same time more uncultured..." (*The Revolt of the Masses*, 1985). He argues forcefully that our (western) schools and universities have almost entirely abandoned the teaching or transmission of culture in deference to "the mere seed" of professional instruction.

Our program fights this trend. We believe that scientific and mathematical insights develop most readily when ideas are integrated and related to everyday experiences of immediate concern and seen in an historical context. Conservation biology provides an ideal vehicle for integrated learning.

The purpose of schooling lies beyond the mere transmission of information. With Mortimer Adler and the Paideia Group we believe "education is a lifelong process of which schooling is only a small but necessary part." It is a preparatory stage designed to form the habit of learning and provide the skills to continue learning after schooling has been completed.

The workshop faculty were chosen for their diverse disciplinary backgrounds, their common interests in environmental issues and interdisciplinary education, and their previous successful collaboration. For more information contact Scott Lewis, Department of Mathematics, Central Washington University, Ellensburg, WA 98926.



The Wilderness and Restoration Alternative

Making Conservation Conservative

by George Romer

Opening the lovely brown parcel from our public servants at the Forest Service (FS), one can usually guess the contents—a Decision Notice. The Ranger’s decision is no surprise either. **Cut it down.** Not all of it, of course; the FS is a public agency and pressure from local activists would never let them choose Alternative A, for All. But they never leave it all alone either (Zahner’s Benign Neglect Option). Your local ranger wants to seem moderate and appeal to everyone, so an alternative that seems like a compromise is usually chosen. We need to put all this in the past....

The best available science tells us that biodiversity is vanishing at unprecedented rates and that most extinctions are due to habitat destruction. Roads are penetrating into the remaining unprotected wilderness throughout North America. Yet, the FS says they are being reasonable because their decision falls in between the two “extremes”—cutting it all or saving it all for its inhabitants.

Environmentalists interested in influencing management of National Forests through “scoping” should stop simply asking the FS not to cut. (Scoping is the process by which the FS collects public opinion which, in theory, influences the management of our public lands.) We should force the FS to increase the number of options available. By adding an alternative more “extreme” than those offered now, we can make preservation seem like the reasonable idea it is.

The more “radical” idea is called restoration. Now, restoration takes many shapes and forms. In fact, Mother Nature should probably be the main contractor for most of the projects. By protecting roadless areas from development, we can let Nature begin returning health to the land.

Some areas, paradoxically, may need human help. Numerous roads need to be ripped. Bridges need to be dismantled. Dams destroyed. Railroads removed. Anything that fragments wildlife habitat and gives humans easy access to the wild should be obliterated.

Such projects should be great for local economies as well. Unlike logging, which is becoming more mechanized each year, active restoration projects are labor intensive. To increase the number of jobs created, simply ban bulldozers and rely solely on human labor and Nature. There’s no reason to start the restoration off wrong by pollut-

Option:

Cut it all.

No cutting.

Remove
Infrastructure.

ing the area with petrochemicals and compacting soil with heavy machines.

Other examples of restoration might include improving fish habitat by stabilizing stream banks and returning large woody debris which originally provided shelter for many species. Many streams are also lined with trash and human waste that needs to be removed. The key to restoration is humility; it's dangerous to assume that riparian ecosystems are fully understood and can be safely manipulated by humans.

Currently, a restoration experiment is under way in the oak savannah of the Midwest. Here, seeds of native species are being planted while controlled fires are being used to mimic natural burns and rid the area of exotics. Restoration such as this can never be a substitute for preservation, but it can help lands recover and is a better use of taxpayer dollars than below cost timber sales.

With the restoration of large tracts of roadless land, the recolonization of large predators such as wolves becomes likely; reintroduction becomes feasible. If the Endangered Species Act is strengthened during the current reauthorization battle, federal agencies may be better funded for such reintroduction efforts. In their restoration alternatives, activists should call for the FS to reintroduce extirpated species where habitat is suitable but natural recolonization improbable. Especially in the Pacific Northwest, where the FS will no longer be able to spend as much attention (and money) on timber programs, funds should be redirected toward species reintroduction.

...Another day, another brown package in the mail from the FS. Another decision—damn—they're not going to rip out any roads this time. Oh well, at least they're not building any new ones and no trees will fall here.

George Romer is an Environmental Studies major at Middlebury College who recently completed an internship for Wild Earth. He thanks gonzo environmental lawyers Ned Mudd and Ray Vaughan for the inspiration for this piece.

Cloud Figures

for hours
the gray animals

have been stampeding
out of the black
forest

in
the sky—

shape shifting
as they leap off the cliff
of the world

and onto a trail of pink
wind which leads
to the sun

so
they
can graze freely

in its yellow field,
and leave

the loud
shots of the thunder-
beings

behind.

—*Therése Halscheid, Ocean City, NJ*

Intercontinental Forest Defense

by Orin Langelle

No doubt about it, the world's remaining forests are being destroyed. Not just the rainforests, temperate ecosystems are also falling at more than just an alarming rate. Although the mission of the Native Forest Network (NFN) is to protect *all* native forests, one of its top priorities has been the creation of an action-based network to support local groups and activists across temperate zones.

Since the NFN hosted the First International Temperate Forest Conference in Tasmania, Australia in 1992, the network has grown quickly in the Northern and Southern hemispheres. In November of 1993 the NFN brought hundreds of forest activists and indigenous people together at the First North American Temperate Forest Conference, held in Burlington, Vermont.

Taking the Forests Back from the Multinationals

NFN has targeted several multinational corporations for their role in global temperate deforestation. NFN's strategy is to oppose these multinationals through consumer education and boycotts plus direct action by activists when appropriate. Corporate institutions worthy of note for their complicity in destroying intact ecosystems include Weyerhaeuser, Hyundai, Mitsubishi, Champion International, Daishowa, Hydro-Quebec and even the Vatican.

Last year the NFN went to the corporate offices of Weyerhaeuser in the state of Washington to demonstrate their outrage at that company's logging practices in the Siberian taiga. This year the NFN is launching a full scale campaign against Hyundai, which is also logging the taiga. In February, the NFN went to Hyundai's US corporate headquarters in Los Angeles to show international opposition. The NFN is calling for a consumer boycott of Hyundai products.

The NFN has called for international rallies and actions this April 14 to coincide with the 50th anniversary of Hydro-Quebec (H-Q). Also in April the NFN will join other groups internationally to protest the Vatican's involvement with the building of the astronomical observatory on Arizona's Mount Graham.

Champion International campaigns are slated for July with a focus on their involvement in the Southeastern US. More campaigns are being planned against Daishowa and others. The NFN is currently supporting international actions against MacMillan Bloedel for their cutting of Clayoquot Sound.

The NFN will be active in the Cove/Mallard campaign

this summer in Idaho. The NFN will also confront the corporate decision makers in small areas, such as Maine's Mount Blue State Park and Britain's Green Man Wood.

The Second International Temperate Forest Conference, sponsored by the NFN, will be held November 9-13, 1994 in Missoula, Montana.

For more information write or call the NFN Resource Center nearest you:

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Orin Langelle traveled to Tasmania for the NFN's inaugural strategy meeting and convened last year's First North American Temperate Forest Conference. He works as a NFN organizer, photojournalist, and global troubleshooter.

Lessons from the Vermont Wilderness

by Christopher McGrory Klyza*

The idea of wilderness has a long history and a variety of different meanings. This essay will focus on a very specific meaning of wilderness: those areas of land owned by the federal government that have been designated Wilderness by law; the technical, legal definition of wilderness. This essay consists of two main parts. In the first, I outline the political history of this legal Wilderness in the United States, especially the East. Laying this foundation is necessary for the speculations that will follow. In the second part of the essay, I offer my thoughts about two main lessons we can learn from Vermont and Eastern wilderness generally: about living with nature and about the re-wilding of nature.

I. ESTABLISHMENT OF THE WILDERNESS SYSTEM

The legal meaning of wilderness can be traced back to the 1920s, when Aldo Leopold, then working for the Forest Service as a forester in New Mexico, argued for the establishment of one wilderness area of roughly 400,000 acres or more in the National Forests of each Western state. His recommendation was followed for New Mexico in 1924, when the Forest Service established the first wilderness, in the Gila National Forest. The agency went on to establish an administrative wilderness system for the entire National Forest system five years later. During the 1930s, Leopold and Robert Marshall worked on behalf of the wilderness idea. Their efforts led to the founding of The Wilderness Society and the adoption of more precise and restrictive regulations for the national wilderness system. Protection was tenuous, however, since establishment of this first Wilderness in New Mexico and both



* I thank John Elder, Stephanie Kaza, Sheila McGrory-Klyza, Steve Trombulak, and numerous students at Middlebury College for their useful comments and discussions in the development of this essay. Earlier versions of the essay were presented at the Sense of Place Symposium, Middlebury College, Middlebury, VT in September 1993 and at the North American Interdisciplinary Wilderness Conference, Weber State University, Ogden, UT in November 1993.

sets of national wilderness regulations were administrative actions. The Wilderness Areas were established by bureaucratic decision and could be modified or eliminated at any time by bureaucratic decision.¹

Wilderness proponents grew wary of this system of administrative designations, especially as the Forest Service rapidly increased timber harvesting on the National Forests following World War II. In 1956, wilderness advocates succeeded in having the first bill to establish Wilderness based on law introduced in Congress. This was a contentious issue, and a final wilderness bill did not become law until 1964, and only after significant compromise. The Wilderness Act declared that wilderness would be: "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain," and the area "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." Slightly over 9 million acres of National Forest land were immediately designated Wilderness and a process was established for adding lands to the Wilderness system. Less than 36,000 acres were designated as Wilderness in the East in three Areas: one in New Hampshire and two in North Carolina.

Eastern Wilderness Act

In the late 1960s and early 1970s, wilderness advocates worked to expand and increase Wilderness Areas in the face of stiff opposition from commodity users and often the Forest Service. The problems were perhaps greatest in the Eastern United States, where the Forest Service would not consider any of its lands for wilderness designation. This was due primarily to the agency's strict literal interpretation of the language of the Wilderness Act. The Forest Service argued that no Eastern areas could be considered for designation as Wilderness since they clearly had been altered by humans.²

The Forest Service's conclusion proved politically unacceptable. There was a strong push for Wilderness on the National Forests in the East. Several factors underlay pro-wilderness sentiment: the demand for recreation in wild areas, which were close to the large urban areas of the East Coast; the desire to protect wild areas in the East from further timber harvesting and road building; and the desire to demonstrate that the East—not just the West—had lands of special quality worthy of this new designation.

Since the Forest Service refused to consider such areas for Wilderness, supporters of designation in the East pressured members of Congress to act. Even President Nixon felt these pressures. In his 1972 environmental message to Congress, he directed "the Secretaries of Agriculture and the Interior to accelerate the identification of areas in the Eastern United States having wilderness potential."³

In response to this dilemma—public demand for Eastern wilderness and an agency interpretation of the law holding that none existed—the Forest Service sought to have a new land category created for Eastern wild lands. A proposal to estab-

lish Eastern wild areas was first introduced in Congress in 1972. This bill, the Eastern Wild Areas Act, was attacked by many environmentalists, who argued that the Forest Service was being too strict in its interpretation of the Wilderness Act and that the new wild areas designation would not offer sufficient protection for these areas. Although the bill passed the Senate, it was not considered in the House.⁴

In the next two years, efforts to designate Eastern Wilderness under the Wilderness Act were spearheaded by Senator George Aiken of Vermont. These efforts bore fruit in 1975. The Eastern Wilderness Areas Act designated 16 Wilderness Areas and listed 17 areas for further study. The Eastern Wilderness Act demonstrated that environmentalists and Congress would not accept the Forest Service's "purity" interpretation of the Wilderness Act.⁵

Passage of the Eastern Wilderness Act created a significant problem for wilderness advocates, however. The core of their argument to protect wilderness during the debate over the 1964 Wilderness Act was that wilderness was irreplaceable; once wilderness had been developed, it could not be reclaimed. This added a great deal of urgency to their arguments to protect areas now, while we still could. The Eastern Wilderness Act undermined this argument, for it implied that wilderness could regenerate on cut-over lands and abandoned farms. An untouched forest was not necessary for wilderness; a recovering second growth forest would be fine. If this were the case, some argued, why was it imperative to protect pristine Western wilderness? Couldn't we cut the trees in these areas and then declare them Wilderness?⁶

A second problem was the size of these Eastern areas. As mentioned above, Leopold conceived of wilderness areas as quite large—400,000 acres, the area through which one could take a two-week pack trip and not backtrack. This size requirement has gradually eroded. In the 1930s Robert Marshall recommended areas be in the 100,000 to 300,000 acre range. The 1964 Wilderness Act set 5000 acres as a minimum size for Wilderness Areas. Yet, in the Eastern Wilderness Act two areas smaller than this were designated, and only three of the areas were larger than 20,000 acres. Hence, the need for both "untrammelled" and sufficiently large areas had been undermined. Now, according to some, wilderness had become a purely political concept that could mean virtually anything. I will argue this is not so.⁷

Vermont Wilderness Areas

The Eastern Wilderness Act designated two Wilderness Areas in Vermont: the 14,300 acre Lye Brook area in Bennington County and the 6500 acre Bristol Cliffs in Addison County. No areas in Vermont were listed for further study. The Bristol Cliffs designation was controversial. The law established a Wilderness Area with over 2000 acres of private land that was to be restricted in use. The designation was made with Association. With the support of local state legislators and the help of the Vermont delegation in Congress, a law modify-

ing the boundaries of the Wilderness Area was passed in 1976. This law reduced the size of the Bristol Cliffs Wilderness to 3775 acres, removing most of the privately owned lands from the area.⁸

The process to establish additional Wilderness in Vermont, and throughout the country, continued in the Forest Service's second Roadless Area Review and Evaluation, RARE II. This study examined what the Forest Service considered to be all National Forest roadless areas eligible for Wilderness designation. RARE II examined six roadless areas, totaling 55,720 acres, in the Green Mountain National Forest as potential wilderness additions: Breadloaf in Addison County, and Devil's Den, Griffith Lake, Lye Brook addition, Wilder Mountain, and Woodford in southern Vermont. In 1979, the Forest Service recommended that none of these areas be designated as Wilderness.⁹

Wilderness advocates disagreed with the Forest Service, arguing that each of these areas should be designated Wilderness. The process continued through the early 1980s, and in 1983 a Vermont Wilderness Act was drafted by the state's two senators—Robert Stafford and Patrick Leahy—and its lone Representative, Jim Jeffords. This bill would designate six new Wilderness Areas totaling 64,000 acres. Feelings on this bill were strong on both sides. In the end, a compromise was crafted: the 1984 Vermont Wilderness Act established four new Wilderness Areas, added to an existing area, and established a National Recreation Area. The new wilderness areas were Big Branch, Breadloaf, George Aiken, and Peru Peak. The addition was to the Lye Brook Wilderness. These areas totaled over 41,000 acres. Combined with the two existing areas, Vermont now had, and has, 59,600 acres of legal Wilderness.¹⁰

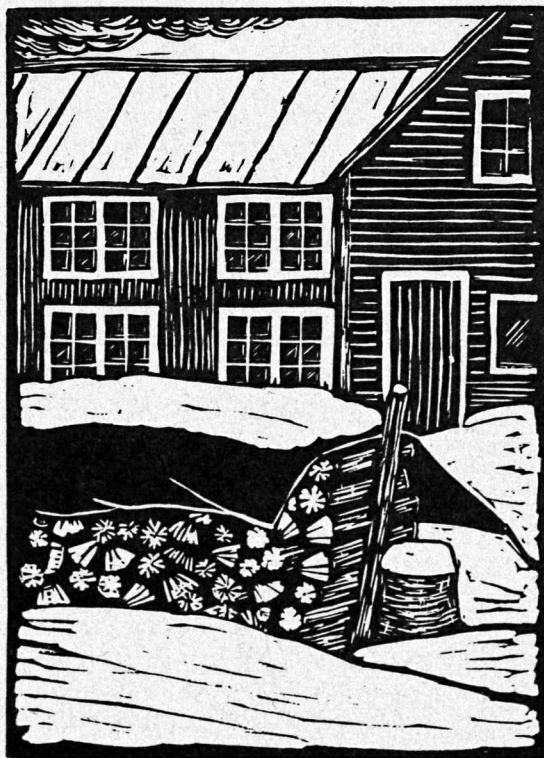
II. LESSONS

One: Living With Nature

Let us now discuss what we can learn from these small, legal Wilderness Areas, areas often dismissed as not important or not true wilderness by those outside the region. One important lesson is how to live better with nature. It is a lesson *perhaps* better learned from Eastern Wilderness than from the far vaster Western Wilderness Areas. I think this might be the case because of their intermingling with human communities, a sharp contrast to the Western Wilderness.

Last summer my wife Sheila and I backpacked up Blodgett Canyon in the Bitterroot Range on the Montana-Idaho border. We camped on the border of the two million acre Selway-Bitterroot Wilderness Area, a wilderness one-third the size of Vermont. Later in the summer, we hiked in the Bridger Wilderness of the Wind River Range in Wyoming. It is beautiful country, but we both found it overwhelming, even a little frightening. Granted, I am from the East, and much of how we relate to a landscape is based on our own sense of place. Nevertheless, I find that areas of such size and scope make it more difficult to think about how I, and humans generally, fit into nature. Such large Western Wilderness Areas are of tremendous ecological significance, and they can teach us much about humility; but Eastern Wilderness is just as important as these large Western areas, though for different reasons.

In Addison County, trips to Breadloaf and Bristol Cliffs are not so intimidating. Unlike areas where humans are visitors, these areas suggest a close relationship between humans and wild nature. Though tech-



nically these two places cannot be developed, they are part of our everyday life—places we walk with our dogs or children, places we ski or snowshoe. As such, these areas suggest an intermingling of humans and nature, not a wall of separation breached only on special occasions. Moreover, in these Wilderness Areas we can connect with land in recovery, develop an intimacy with land that we have severely damaged in the past. It is a way for us to realize where we are as a society. So, ironically, I think an intimate relationship with wild nature as part of life rather than some “other” *might* be easier for people in Vermont than in the West because the boundaries between wilderness and culture are less distinct and our historical transgressions are clearer. Such relationships, I think, are necessary to reconnect with nature in a way that can lead to sustainable human and natural communities.¹¹

Two: The Re-Wilding of Nature

A second lesson we can learn from these Eastern Wilderness Areas has to do with the re-wilding or the recovery of the land. This is a lesson we won't learn from most of the Western Wilderness Areas, since they have had virtually no disturbance by non-native peoples (except for livestock grazing in some areas, the effects of which are not apparent to most people, though they are often severe). Here in the East, areas now Wilderness have experienced large-scale human disturbances. Most in Vermont were cleared of their forests for timber and pasture land. Today, with the forests returning, the land is recovering its integrity.¹²

Not far from my house, Ospreys nest on Bristol Pond, Peregrine Falcons nest on the cliffs of Deer Leap Mountain, and Moose roam the nearby mountains. Back just one day from the wild West, we stopped the car to let a Moose cow and calf cross Route 125 near the Middlebury Gap. These creatures are living in the midst of human communities. Whether or not these animals make the legal Wilderness their home, the designated Wilderness Areas serve as the cores of the wild areas they need to flourish.¹³

We, as a society and polity, must not grow complacent with the return of these animals and what they represent. We need to think of them as a gift, a second chance. The Osprey, Peregrine Falcon, and Moose were eliminated from our area by human actions, and they can disappear again just as quickly if we don't pay attention. If we do pay attention, they can help instruct us in proper ways of living and relating with nature. These are lessons that need to be learned and need to be shared.

CONCLUSIONS

In conclusion, let me connect these two points to the previous problems cited with the establishment of Wilderness in the East. One problem had to do with the small size of Wilderness in the East. I see this as a problem in one sense, but not in another. It is a tremendous problem in terms of supplying necessary habitat for certain animals, such as Gray Wolf and Wolverine and Catamount. We need much more Wilderness in the East, some of which should be in much larger parcels, hundreds of thousands to millions of acres, and these wild areas must be connected to one another. It is not a problem, though, for helping us to better find our place in nature, with nature. Such smaller Wilderness Areas may better help us as a people achieve an understanding with nature than the massive Western Wilderness Areas.

The second problem had to do with re-generated wilderness versus virgin wilderness. This too may not be the problem it seemed. Again, we can learn a great deal about how nature recovers by paying attention to Eastern Wilderness Areas.

I realize I am walking a treacherous path here. Some might take my arguments as being a justification for the status quo. Am I suggesting we do not need large Wilderness Areas, or that we need not set aside wild places because they will always return? The answer to both questions is a resounding no. However, I think our need for such legal Wilderness generally is indicative of the troubled relationship between humans and nature in our society. Legal Wilderness implies that there is a place for humans, and a place for nature; that the two are distinct and different. This is a problem. We should be trying to envision a world in which nature and humans are not separate, but are part of a common fabric.

Given the state of our society, though, I am an unabashed proponent of big Wilderness. We need the current Wilderness system and we need to expand it greatly in order to protect biodiversity and natural systems, and just because wild nature has inherent value. Such a legal Wilderness system is the only way to save what wild areas still exist and to restore and protect new ones. This system is a sort of necessary evil, or a bridge (albeit a thousand or more year bridge) during what I hope is a transition to a future where humans and nature can more fruitfully co-mingle and co-exist. Larger Wilderness Areas are necessary to serve as homes for those species that cannot survive close contact with the current human civilization, as reservoirs for wildness. And of course, it is better to save areas that are already wild than to rely on good fortune for these lands to re-wild.

So, the typical Eastern Wilderness—smaller and recovered—should not replace Western Wilderness; but it should not be dismissed either. It offers us a valuable opportunity to further explore perhaps the greatest challenge facing humans: how to better understand our place in nature and act accordingly.

Chris McGrory Klyza teaches Political Science at Middlebury College (Middlebury, VT 05753) and is an avid explorer of Vermont Wilderness.

NOTES

- ¹ Samuel T. Dana and Sally K. Fairfax, 1980, *Forest and Range Policy*, 2d ed., New York: McGraw-Hill, pp. 132-133, 155-158; Aldo Leopold, 1991 [1921], "The Wilderness and Its Place in Forest Recreational Policy," in *The River of the Mother of God and Other Essays*, Madison, WI: University of Wisconsin Press, pp. 78-81.
- ² Craig W. Allin, 1982, *The Politics of Wilderness Preservation*, Westport, CT: Greenwood Press, p. 187.
- ³ Nixon as quoted in Allin 1982, p. 188; Allin 1982, pp. 187-188; Dana and Fairfax 1980, p. 300.
- ⁴ Allin 1982, pp. 188-190; John Elder, 1984, "Vermonters and Wilderness: A Legacy and a Lesson," *Vermont Life*, Fall, pp. 48-55.
- ⁵ Allin 1982, pp. 190-192; PL 93-622, 88 Stat. 2097, 16 U.S.C. Sections 1131-1132.
- ⁶ Dana and Fairfax 1980, pp. 300-301.
- ⁷ Dana and Fairfax 1980, p. 301.
- ⁸ See: Lloyd C. Irland, 1982, *Wildlands and Woodlots: The Story of New England's Forests*, Hanover, NH: University Press of New England, pp. 101-102; Pat Orvis, 1975, "Families Fight Eviction from Wilds of Vermont," *New York Times*, October 26, VIII, p. 1; Outlook Club of Bristol Vermont, 1980, *History of Bristol, Vermont: 1762-1980*, 3d ed., Bristol, VT, p. 39; U.S. Congress, House, 1976, "Providing for the Modification of the Boundaries of the Bristol Cliffs Wilderness Area," House Report 94-984, 94th Congress, 2d Session; U.S. Congress, Senate, 1975, "Modification of the Boundaries of the Bristol Cliffs Wilderness Area," Senate Report 94-414, 94th Congress, 1st Session; U.S. Congress, Senate, Subcommittee on Environment, Soil Conservation, and Forestry of the Committee on Agriculture and Forestry, 1975, "Hearings on Bristol Cliffs Wilderness," 94th Congress, 1st Session, September 28-29, Bristol, VT; PL 94-268, 90 Stat. 370, 16 U.S.C. Sections 1131-1132.
- ⁹ Irland 1982, p. 102. See also United States Department of Agriculture, Forest Service, 1978, *RARE II: Northern Appalachian and New England States* (Supplement to Draft Environmental Impact Statement Roadless Area Review and Evaluation), Milwaukee: USFS Eastern Region.
- ¹⁰ See: Elder 1984; U.S. Congress, House, 1983, "Designating Certain National Forest System Lands in the State of Vermont for Inclusion in the National Wilderness Preservation System and Designating a National Recreation Area," House Report 98-533, 98th Congress, 1st Session; U.S. Congress, House, Subcommittee on Public Lands and National Parks of the Committee on Interior and Insular Affairs, 1983, "Hearings on Additions to the National Wilderness Preservation System," 98th Congress, 1st Session, July 9, Manchester, VT; U.S. Congress, Senate, 1984, "Vermont Wilderness Act of 1984," Senate Report 98-416, 98th Congress, 2d Session; U.S. Congress, Senate, Subcommittee on Soil and Water Conservation, Forestry, and Environment of the Committee on Agriculture, Nutrition and Forestry, 1984, "Hearings on Vermont Wilderness Areas," 98th Congress, 2d Session, February 1; PL 98-322, 98 Stat. 253, 16 U.S.C. Sections 1131-1132. For a discussion of management issues in Vermont wilderness areas, see Larry Anderson, 1993, "The View from Breadloaf," *Wilderness*, Spring, pp. 10-19.
- ¹¹ For a discussion of wilderness as "the other," see Thomas H. Birch, 1990, "The Incarceration of Wilderness: Wilderness Areas as Prisons," *Environmental Ethics*, 12: 3-26.
- ¹² For further discussion on the re-wilding of the east, see Dave Foreman, 1993, "Eastern Forest Recovery," *Wild Earth*, Summer, pp. 25-28.
- ¹³ On the return of the Peregrine Falcons, see John Elder, 1991, "Gyres Above North Mountain," *Vermont Life*, Autumn, pp. 26-29.



Book Reviews

BACKTRACKING: The Way of a Naturalist

by Ted Levin, Chelsea Green Publishing, Chelsea, Vermont, 1987; 220p. \$19.95.

BLOOD BROOK: A Naturalist's Home Ground

by Ted Levin, Chelsea Green Publishing, Post Hills, Vermont, 1992; 207 p. \$14.95.

Ted Levin is angry. Habitat destruction, species loss, wildlands decline—all the usual reasons. But for naturalist/writer Levin these attacks are personal. Few of us know life as intimately as the author of *Backtracking* and *Blood Brook*. Ted Levin has lived with a fisher in his bathroom, nursed a short-tailed weasel, raised black widow spiders, and marveled at ichneumon wasps in suburban Long Island. His wet-sneakers enthusiasm gets us down on hands and knees, marvelling at the unexpected wonders we find in his writing. Biodiversity is not simply a buzz-word for Levin; it is his life.

Levin does more than share his insights on the lives of other creatures. His writing displays a focused outrage at the damage our culture inflicts on the natural world, his world. Whether it is the demise of an old eastern hemlock, cut down for museum benches, or the destruction of rare eastern timber rattlesnakes, killed out of willful malice, Levin writes his pain down to the bone. "What kind of person could deliberately destroy a timber rattlesnake, emissary from another epoch?" In *Blood Brook*, Levin laments the spreading distance between people and the natural world:

Nature documentaries now come into our homes nightly, simultaneously educating us about animals and detaching us from the natural world...Packaged for the short attention span of the average television viewer, nature appears to

be colorful, mysterious, dramatic, sometimes gruesome, and accessible to the point of promiscuity. Where are the clouds, the rain, the bone-chilling wind, the mosquitoes, the empty landscapes?

Nature red in tooth and claw is Ted Levin's world. He does not flinch at the macabre sexual rites of dragonflies or the bloody predations of hawks, weasels, and ambush bugs. A road-killed whip-poorwill is an opportunity to teach his son, Casey, about the cycle of life. Squeamish readers may balk at the depiction in *Blood Brook* of a teen-aged Levin dissecting a live frog, but he does not apologize. Instead he argues that "watching and handling living things as they are transformed from living to dead serves us intellectually, maybe even spiritually, in ways that are just as basic as the ways a hare serves the bobcat and a grouse serves the goshawk."



Neither *Backtracking* nor *Blood Brook* wear us down with weighty sermons. Levin skillfully weaves humor, humility, and an unrepentant love of baseball into his versions of natural history. "I had faith in three things when I was ten years old: the New York Yankees; a benevolent God...; and nature. My faith in the first two has since crumpled." Levin's writing finds the delicate balance between anger and laughter that allows him to deliver a powerful message.

Backtracking and *Blood Brook* are collections of essays based largely on Ted Levin's experiences in New England. *Backtracking* retraces his life on the trail of wild nature. "When I come upon an animal's tracks in the woods I often find myself moving back against the animal's direction to trace where it started from. The old familiar terrain, it turns out, is in a state of flux—just as I am—so that, with the passage of years, each return trip brings new surprises." In *Blood Brook* we enter Ted Levin's watershed, literally. The namesake stream heads just uphill of his Vermont home, and flows through his picture-window world. "The study of nature begins at home, with a knowledge of local geography and an attempt to be part of the ebb and flow of one's backyard, the only place where you'll be more than a visitor." *Blood Brook* is a celebration of humble homelands. For his dedication to home ground, Levin holds a place with Gary Snyder, Wendell Berry, and Terry Tempest Williams.

For Ted Levin, intimate knowledge brings profound respect. As he writes in *Blood Brook*, "not even the finest films in the world can replace what actually happens to us."

Reviewed by Brad Meiklejohn (Box 1420, Durand Rd., Randolph, NH 03570), University of Vermont Field Naturalist.

ESSENTIALS OF CONSERVATION BIOLOGY

by Richard B. Primack, Sinauer Associates, Sunderland, MA; 564 p. \$28.95.

Conservation biology is one of the most exciting and rapidly growing fields in the natural sciences. Combining interdisciplinary scientific understanding with advocacy, conservation biology is confronting the global loss of biological diversity and natural ecosystems. But until now there has been no comprehensive unified overview of the subject. With the publication of *Essentials of Conservation Biology*, a text is finally available that can be enjoyed by both academics and interested laypersons.

Designed as an introductory textbook for undergraduate college students, it will also benefit anyone involved in conservation issues, from professionals in natural resource management to journalists who want to write intelligently about environmental issues to staff members of conservation organizations. Indeed, business and political leaders should read *Essentials of Conservation Biology* as well.

The text covers island biogeography, minimum viable population theory, and other elements fundamental to understanding the current crisis; but it goes well beyond basic biology by discussing conservation history, ethical values associated with preservation, economic arguments, conservation strategies, and laws applicable to ecosystem and species conservation nationally and internationally. Chapters include: What is Biological Diversity?; Habitat Destruction, Fragmentation, and Degradation; Population Biology of Endangered Species; Designing Protected Areas; and Restoring the Environment.

Essentials of Conservation Biology is easy to read, with a minimum of technical jargon. Nearly every concept is illustrated with real life situations. Even the charts are understandable! Sidebars highlight current controversies such as "Owls vs. Jobs," "Giant Panda," "Songbird Decline in North America," and "Decline of Fungi in Forests."

The bibliography has over 1000 references. It includes the latest literature and concepts.

Read this book and you will come away with a firm understanding of the biodiversity crisis and the discipline formed in response to that crisis.

Reviewed by George Wuerthner, Box 273, Livingston, Montana 59047

THE RETURN OF THE WOLF

by Steve Grooms, Northword Press, Minocqua, WI; 192 p. \$16.95.

The Return of the Wolf is a good overview of wolf biology as well as issues surrounding restoration and management of wolf populations. Steve Groom's writing is engaging. The book is attractively laid out and has an abundance of first-rate color photos.

The book begins with a history of human attitudes toward wolves and interactions between the two species. This is followed by a chapter about wolf evolution, which explains the origin of Red Wolves (*Canis rufus*), Gray Wolves (*Canis lupus*), and Mexican Wolves (*Canis lupus baileyi*.) Biologists believe the earliest wolves evolved here in North America, with the Red Wolf an early form. During the last Ice Age, this primitive wolf, isolated in Alaska, evolved into a larger form that we know today as the Gray Wolf. From its northern center of evolution, it migrated south, as well as westward into Asia and Europe.

Five chapters cover regional wolf issues for the Eastern Timber Wolf, Mexican Wolf, Red Wolf, wolves in the Rockies, and the present controversy surrounding wolf control in Alaska. Sub-topics like the Endangered Species Act, compensation programs, and whether to reintroduce wolves to Yellowstone are reviewed. These chapters are generally good, though the discussion of the Eastern Timber Wolf focused almost exclusively on the Midwest, where the Timber Wolf still survives. I hope future editions will give greater attention to wolf restoration potential in New England. Similarly, the discussion on the Rocky Mountains focused almost exclusively on the Northern Rockies, and never mentions potential wolf restoration in Colorado or Utah.

Overall I found the book accurate and scientifically sound. The author makes clear that many issues surrounding wolves are more political than biological. He appears, though, to have an overriding faith that biology isn't corrupted by politics. This comes out vividly in the discussion of wolf control in Alaska. The author hastens to point out that most outsiders don't understand Alaska or wolf biology. Wolves are not endangered in that state, we are told, and wolves and their prey do not live in harmony or "balance." In fact, current

...the best
overview of the
issues swirling
around wolves
today...

research supports the notion that wolf numbers will eventually crash if prey becomes too limited but with a lag period before this occurs. Thus predators like wolves can "suppress" prey numbers for years—in fish and game parlance, they are "out of balance." The author says that wolves are responsible for more prey deaths than are human hunters. The conclusion we are led to accept is that we have no choice but to control wolves if we are to have Caribou and Moose for people to hunt and for wolves to eat as well.

This is essentially the line of the Alaskan Department of Fish and Game (ADFG). Neither Groom nor the ADFG biologists question the basic assumption that it's fine to short-circuit this cycle. Upon learning that wolves could suppress prey populations for years, I wondered what ecological value this could have for the ecosystem. I haven't researched the answer, but I suspect that natural suppression of prey numbers might permit vegetative communities to recover from browsing pressure (essentially, predation from herbivores). Whether or not this is the case, the assumption that prey suppression is a problem should be rejected.

Agency biologists often overlook ecological values in order to produce a "product"—something to shoot. Usually implicit in the control of wolves are the assumptions that agencies like the ADFG know what the right numbers of Moose, Caribou and Gray Wolves are, and that it's ethically right to set "Nature's house in order."

Despite these shortcomings, *The Return of the Wolf* is the best overview of the issues swirling around wolves today. I highly recommend it for those wanting a good introduction to wolf issues across the continent.

Reviewed by George Wuertner

CAPTIVE BREEDING and CONSERVATION

New World Parrots in Crisis, Solutions from Conservation Biology

Steven R. Bessinger and Noel F.R. Snyder (eds.), Smithsonian Press, Washington, DC, 1992; paper \$16.95, cloth \$35.

This book is not just about parrots, nor even just about the biology of endangerment. It is a much needed and insightful survey of the politics and biology of conservation. A dozen papers offer lessons from those who have worked in the field for years. Parrots are the theme, but the problems and strategic implications of conservation efforts apply to other species as well.

At the risk of doing the volume as a whole injustice, I will focus on Derrickson's and Snyder's paper on the potentials and limits of captive breeding. I do so because they offer a well-informed and realistic assessment of what we can expect highly interventionist strategies, such as captive breeding, to do for conservation. The debate within conservation biology, and among conservation strategists generally, between those who emphasize conservation *in situ* (on site, in the wild) and those who say *in situ* solutions are not politically possible and therefore interventionist strategies must be pursued, is often more passionate than intelligent. Derrickson and Snyder provide both intelligence and a passion for conservation. Above all, they want conservation to work, to be effective.

"The preservation of species is clearly best served," they argue, "by conservation methods associated with habitat, community and ecosystem preservation." Interventionist strategies, such as captive breeding (*ex situ* breeding), have severe limitations. They see intervention as being necessary when all else fails, but only as part of a strategy aimed at reintroduction to the wild. Further, reintroduction only becomes a realistic strategy when the causes of decline have been determined and addressed. Their position is supported not

...a much needed and insightful survey of the politics and biology of conservation.

just by biological evidence but also by political evidence: the costs of interventionist strategies are usually as expensive, if not more so, than habitat preservation. A brief summary of the problems associated with captive breeding will make apparent problems with interventionist strategies.

It is often difficult to sustain populations of many species in captivity for a variety of reasons: genetic, physiological, and psychological influences of captivity as well as human handling often result in low rates of reproduction. Taking more individuals from the wild to continually supplement captive populations adds to the negative pressure on wild populations.

The trauma of capture, transportation over wide distances, proximity to others animals in a captive setting, captive breeding and genetic diversity loss, can all lead to enhanced susceptibility to disease and transmission of disease. Disease may wipe out a captive population or make it impossible to achieve needed net rates of reproduction. Disease may also spread to wild populations.

Captive populations and populations dependent on significant human intervention tend to lose genetic diversity, due largely to small founder populations, inbreeding, and genetic drift. Since captive breeding or other intensive human intervention is usually undertaken with species already suffering from reduced populations, problems can be compounded.

For many species, captivity results in loss of certain behavioral characteristics important to survival in the wild, such as predator recognition, suitable habitat selection or mate selection. The drift toward domestication may enhance reproduction in captivity but may also

reduce fitness for the wild. It is difficult to judge the effects of captivity or intervention until after the animals are released and the maladaptations become apparent, by which time bad changes may be impossible to reverse.

Captive breeding does not only present biological problems. Political problems, too, make human intervention a dubious choice for species preservation. Long-term continuity and commitment—of scientific staff, public or private funds, and other resources—are required for captive breeding and similar programs. Neither quality is a hallmark of human institutions.

Much of politics (and economics) concerns the allocation of scarce resources. Captive breeding and other forms of intensive human management are very expensive. Existing zoos could probably only house minimum viable populations of 500-800 vertebrate species (in some form—is a wolf in a zoo still a wolf?) and zoo funding has never been stable. The California Condor program has cost over \$500,000 a year without even producing a minimum viable population. What amount of money can we expect societies to commit over the long haul and with continuity to carry on such programs? If *in situ* conservation is possible, it should be chosen. It has, of course, the added advantage of protecting other species at the same time. (Why habitat preservation is not always chosen raises disturbing questions about us: does it undermine our sense of importance or control?)

Derrickson and Snyder do see an important role for captive breeding, despite all its drawbacks, but only after field work has determined it is the appropriate option. In such cases the goal must be to reintroduce the species into the wild. Captive breeding is a stop gap, not a long-term alternative. It can be used as a safety net for species in trouble or to offer a short reprieve where a species is virtually gone in the wild. In either case conservationists must strive to get species back to the wild before the negative effects of captivity reduce fitness.

The authors recognize the decision

to undertake captive breeding (or other interventionist alternatives) is difficult. Taken too late, extinction may not be averted; taken too soon, valuable resources may be diverted from other conservation efforts.

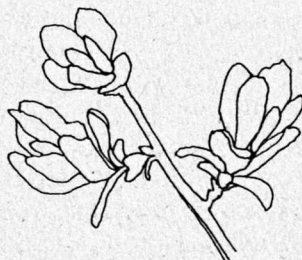
Derrickson and Snyder offer captive breeding guidelines that should be obvious but haven't often been recognized conceptually or in practice: captive populations should be kept in their natural habitat or the closest possible approximation to it; there should be a number of populations at separate facilities; they should be kept apart from feral populations; caretakers should be working only with one species at one facility; and other disease prevention measures should be undertaken.

Derrickson's and Snyder's paper is essential reading for anyone who would presume to be part of the debate on conservation strategy.

Other papers in this volume also tackle difficult problems. What can be done in poor countries where development pressures are strong, poverty widespread and enforcement of conservation laws weak, to ensure habitat and species protection? Eco-tourism and education are two alternatives evaluated. Authors explore better control of trade or trade bans, real enforcement of CITES, limited human exploitation of some animals, and methods of resolving conflicts between agriculture and threatened species.

This is a book for every conservationist, not just those concerned with parrots or birds. Hopefully this volume will stimulate readers to address the conservation choices we face with other species, too, in a wise and informed manner.

Reviewed by David Johns, *The Wildlands Project Executive Director*



MERRY MEN

by Carolyn Chute, Harcourt Brace, 1993; 610 p. \$24.95.

As the attention of the wildlands movement shifts more to the East, activists will discover several differences from the West. Very little land is federally owned, and most areas are, in comparison to Idaho or Montana or Wyoming, long-settled. Which means that more than ever before, conservation will have to grapple with local culture and local economy. There are few better places to start than by reading Carolyn Chute's new novel, *Merry Men*.

It's not exactly a *Monkey Wrench Gang* for the eastern seaboard. It's funny in spots but not rollicking, and the call to action is in this case as much a sigh of despair. And by comparison, this novel is crowded with people—the landscape is not the dominant character, as it is in almost any Western.

But this is truth-telling of the same order, a rage at the treatment of both land and people that may someday come to play a bit of the same role for northern forest activists that Abbey's glorious romp has played for desert rats. From start to finish *Merry Men* rings with the truth of northern New England and the Adirondacks: its people have no control over their lives and their landscape, persisting in a poverty so old it feels obvious.

This is the poverty described in a recent *Wall Street Journal* article about minimum wage jobs in rural America. Focusing on a family in Vermont's Northeast Kingdom, the reporter followed a man who stencils logos on hockey sticks for \$188.40 a week—unable to afford food, he's trying to hunt for table meat, but all he can see to shoot is a crow, "edible if you cook it just right." His brother-in-law, who feeds a family of five on \$5.95 an hour, burns kerosene lamps to save on electricity. "Work is what made this country great," the brother-in-law says. He has a huge American flag draped across his make-shift porch; both men are conservative Republicans.

And both men could have stepped straight from the pages of Chute's book, a galley of characters who are personally powerful ("easy muscularity, that Dougherty blood") but completely powerless in the face of the modern, distant world. "Modern education is working on everyone to be desk people or people who fail at being desk people," said Chute in a recent interview. "There's no chance for an A plus on working with old people or growing your own food. There's only Desk." The town's trees are disappearing daily in the back of trucks heading for chipping mills. Hunting is harder each fall because new summer homes suddenly loom up behind the bucks in your sights. The paper company, "which is despised and loved," fires anyone who gets sick, and then finally shuts down. One of her most inspired characters, a young wife named Anneka, writes letters to the governor and gets bland, genial replies. "Feel free to contact me again with your concerns about this issue...." She sneers. "We are All in Deep Shit."

True enough. And in deeper shit yet because they misunderstand some of the

sources of their trauma. Like the men in the *Wall Street Journal* article, their patriotism burns with an intensity inversely related to the degree the system has shafted them. The Robin Hood character, Lloyd, writes this poem at the age of 8:

Democrats

*Democrats are stupid.
Democrats want to spent. republicans
never spend. They save.
They make a contry nise. If you want to
live hear be a republican otherwis go
live in rasha were its old also salt minds.
Its were you work Must be weed.*

The poem is a perfect expression of the North Country's conservatism, which invariably elects to office the representatives of precisely those interests—big timber and big real estate—most destructive to the community. Their worldview is almost impossible to crack—at one point some southern labor organizers show up in Egypt, Maine, where this book is set, and seem to speak a different language. People who go to college are sneered at when they return—a self-defeating cast of mind.

Still, this culture has some shrewd strains that might help spawn a more decent politics. Along with the innate Republicanism comes a kind of instinctive class-consciousness, born of watching idiots build enormous summer homes. "The building boom, they called it. Progress. Yes, progress. Five hammers for five weeks. Then bingo!...the Volvos and BMW's in the two-car garage, the lawn grassed." Where I live, in the Adirondacks, the only thing most of the wacked-out John Birchers and the "environmental extremists" and the sensible folk can agree on, is that there shouldn't be more summer homes up here.

Yet there are more every year, as developers fill the woods with empty two-weeks-a-year

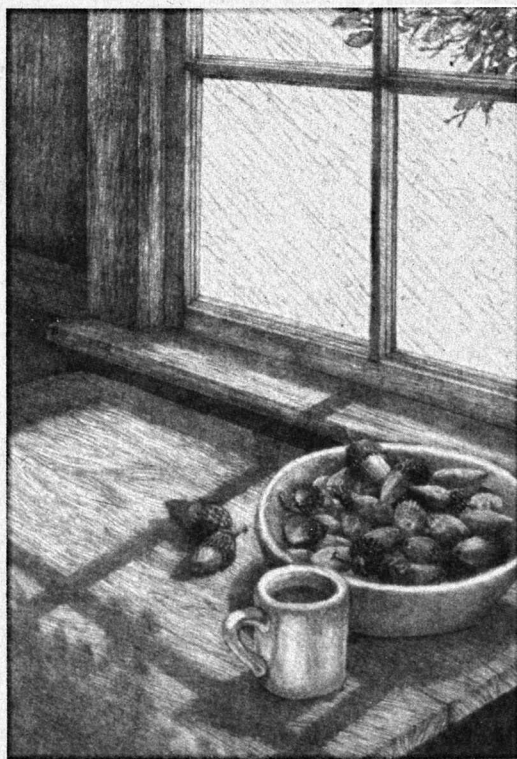
homes for people from elsewhere whose lives are empty.

The prospect of a coalition between natives and outsiders with clout who commit themselves to an area—that's one of the tantalizing hopes for the future of these places. We're seeing this in infant stages with groups like Preserve Appalachian Wilderness. *Merry Men* climaxes with one such attempt. It's a despairing climax, for Lloyd is, in Chute's words, simply "driven mad" by his vision of the future—of busted families, busted land, the rich forever preying on the deluded poor. Forget coalitions—he drives away his one real potential ally because she comes from money, because she's spiritually tied to all that is destroying his people.

In person, Chute is a tad less despairing. "If everyone stopped, if they listened to people like Wendell Berry or Thomas Jefferson, if they thought about how important community is—if they forgot Walmart and went to each other—it might be possible to protect some lives, some places," she says, and she cites the few Community Supported Agriculture vegetable farms in southern Maine as glimmers of hope. "There's always going to be poor, but at least we used to have the skills to survive, and we had our dignity, and our families." But now the momentum in the other direction is so strong—in this free-trading tv-driven culture, the only "dream is to makes lots of money and to shop." Humans, animals, forests—"our independence is all getting chewed up by the same thing," she says.

If that momentum is to be reversed—if the lands of the Northeast, where it rains enough that recovery remains a possibility, are to one day slide back into wildness, home to small communities of people and of other creatures—then a new dialogue must start soon. Those who hope to take part in that dialogue will find no better Berlitz for the local dialect than *Merry Men*.

Reviewed by Bill McKibben, resident of New York's Adirondack Park and author of The End of Nature and The Age of Missing Information



GLOBAL MARINE BIOLOGICAL DIVERSITY: A Strategy for Building Conservation into Decision Making

edited by Elliott A. Norse; Center for Marine Conservation, World Conservation Union, World Wildlife Fund, United Nations Environment Programme, World Bank; A Contribution to the Global Biodiversity Strategy; 1993; Island Press (POB 7, Covelo, CA 95428); 383p.

Here, finally, is a clear accessible introductory yet comprehensive volume on ocean life, threats thereto, and the nascent science that should soon inveigh against the threats: marine conservation biology. Elliott Norse has skillfully compiled vast amounts of information on the 70% of the planet covered by ocean.

The prognosis is grim but not hopeless. The oceans remain in possession of most of Earth's phyla: 28, 13 of these endemic (terrestrial ecosystems have 11, only 1 not shared with the ocean); Earth's only known communities that do not obtain their energy from the sun (chemosynthetic bacteria living near deep-sea hydrothermal vents and the rich faunal assemblages, including tube worms, they support); perhaps ten million unknown deep-sea animal species (many of these benthic polychaete worms); complex marine food webs in which viruses play key roles; bony fish that can swim at speeds of over 50 miles per hour (Atlantic Bluefin Tuna are among the fastest and biggest bony fish, and commonly attained weights of 1500 pounds—before being fished toward smallness and extinction); some of Earth's oldest vertebrates—coelacanth, which were supposed to have gone extinct 70-80 million years ago until scientists discovered *Latimeria chalumnae* alive in the Indian Ocean early this century; Earth's oldest known life forms—cyanobacteria ("blue-green algae"); and possibly Earth's most charasmatically challenged multicellular organisms—hagfish.

This resplendant diversity is threatened, of course, by industrial emissions,

erosion, litter, alien species, overfishing, mining, dredging, stratospheric ozone depletion, global warming and other human insults. Though most environmentalists know of these threats, few realize the degree to which we are already overexploiting the oceans and have already diminished their biodiversity. Norse offers numerous stunning statistics. For example, shrimp trawlers have an incidental kill of over ten billion fish a year: that is, 10,000,000,000 plus fish killed and discarded, with unknown but undoubtedly profound reverberations in marine food webs. (p.195)

Norse suggests that, though scientists have documented only two extinctions of marine invertebrates, we've likely caused many others. Biologists know even less about marine biological diversity than about terrestrial biodiversity. They are beginning to find, however, that oceans are more speciose and less homogenous than has commonly been thought. Endemicity may be high even in mid-ocean benthic and pelagic habitats. Partitioning, it seems, is as much a part of life in the sea as life on land, with distinctions drawn by salinity and temperature gradients, currents, sea ice, topography, and sea floor features such as hydrothermal vents.

Another recent marine revelation is the impact of noise pollution. Norse notes that unnatural noises are now pervasive in the oceans and may pose the worst stress for some species that are acutely sensitive to "sound at frequencies like those produced by shipping and underwater construction" (113). We've made life miserable for cetaceans.

Norse lends support to the many of us who have long assumed that the mysterious "red tides" and other dreaded al-

gae blooms stem from human causes, at least in part. Norse speculates that these population explosions of dinoflagellates and other phytoplankton may be related to anthropogenic eutrophication of coastal areas (from sewage dumping, agricultural erosion, etc.) and release of alien planktonic species in ballast water.

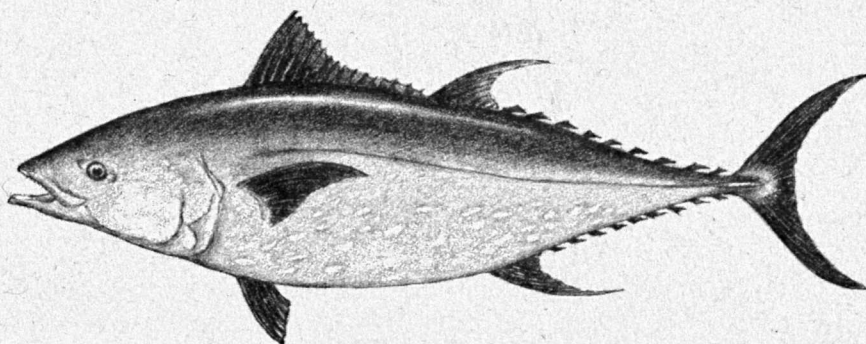
He also reinforces our views on why wildlife is imperiled worldwide. He offers five basic reasons why ocean biodiversity is in trouble:

- 1) *There are too many people.*
- 2) *We consume too much.*
- 3) *Our institutions degrade, rather than conserve biodiversity.*
- 4) *We do not have the knowledge we need.*
- 5) *We do not value nature enough.*

I'll violate scientific protocol if I do not heave some insults at this book. I'll dig through my notes and seek its Achilles' heels.... It is restrained in its condemnations and moderate in its exhortations; but considering the book was a collaborative effort of World Bank and UNEP, as well as the Center for Marine Conservation, IUCN, and WWF, it is remarkably candid. Like most works by biologists, it calls more for information and research than for frugality; it portrays problems as results more of human ignorance than of human avarice. Yet, no matter how much knowledge we gain, as long as we demand infernal combustion engines and canned tuna, sea life will be in trouble.

Notwithstanding these requisite opprobrious remarks, I highly recommend *Global Marine Biological Diversity* to all who like ocean life—and, by extension, land life. This will prove to be one of the most important works of the 1990s.

Reviewed by John Davis



She tore her legs that were held; she gnawed in frenzy at her flank, she chopped her tail in her madness; she splintered all her teeth on the steel...

**ECO-CLASSICS:
Ernest Thompson Seton**

If the Boy Scouts of America were told to read the works of the first Chief Scout, they would be radical ecologists. Their sympathies would be with the hunted and the trapped, rather than (as is the case with some of the nation's "mature" Scouts) with the NRA and the American Legion. Ernest Thompson Seton (1860-1946) was born in South Shields, County Durham. When he was six, he emigrated to Canada with his family, and eventually became Naturalist to the Government of Manitoba. He founded the Woodcraft movement which amalgamated with the Boy Scouts.

Seton's volumes include *Lives of the Hunted*, *Wild Animals I Have Known*, *Animal Heroes*, *The Trail of the Sandhill Stag*, and *The Biography of a Grizzly*. Creative Arts Book Company is to be commended for reissuing these classics in such attractive editions. The books were illustrated by the author, and artists and writers will probably add Seton to what I call the "Blake Debate." Was he superior as an artist or a writer? Seton's line drawings bring forth vitality of the wildlife and add humor to what are mostly grim tales.

Seton addresses tragedy in his introductions. "For the wild animal, there is no such thing as a gentle decline in peaceful old age. Its life is spent at the front, in line of battle, and as soon as its

powers begin to wane in the least, its enemies become too strong for it; it falls. There is only one way to make an animal's history un-tragic and that is to stop before the last chapter."

Seton writes as a naturalist. In some tales (e.g. "Badlands Billy") he understands the plight of the rancher and does not as fully sympathize with the wolf as a contemporary animal writer would. Seton was not an outspoken anti-vivisectionist or a vegetarian. "I do not intend primarily to denounce certain field sports, or even cruelty to animals. My chief motive, my most earnest underlying wish, has been to stop the extermination of harmless wild animals; not for their sakes, but for ours..."

Disclaimers aside, I dare readers to think about the following passage from "Badlands Billy" and remain unmoved. After losing her cubs to strychnine poisoning, the mother wolf is caught in a leg hold trap. "She tore her legs that were held; she gnawed in frenzy at her flank, she chopped her tail in her madness; she splintered all her teeth on the steel, and filled her bleeding foaming jaws with clay and sand. She struggled until she fell, and writhed about or lay like dead, till strong enough to rise and grind the chains again with her teeth. And so the night passed by."

Seton's final years were spent in New Mexico, where he built a village based on Navajo community life and attempted to teach people the Indian value system. Humans, alas, tend to take what they need. Scores of readers of Seton's books (*Wild Animals I Have Known* sold several hundred thousand copies from 1898 to 1946) learned how to light a fire without matches and how to track deer (*The Trail of the Sandhill Stag*), but have much to absorb in terms of empathy for animals and a determination to stop the perpetual slaughter.

Books by Ernest Thompson Seton (dedicated to "Preservation of our wild creatures") are available from Creative Arts Book Company, Berkeley and were re-issued in 1987.

Reviewed by Naomi Rachel, 954 Arroyo Chico, Boulder, CO 80302

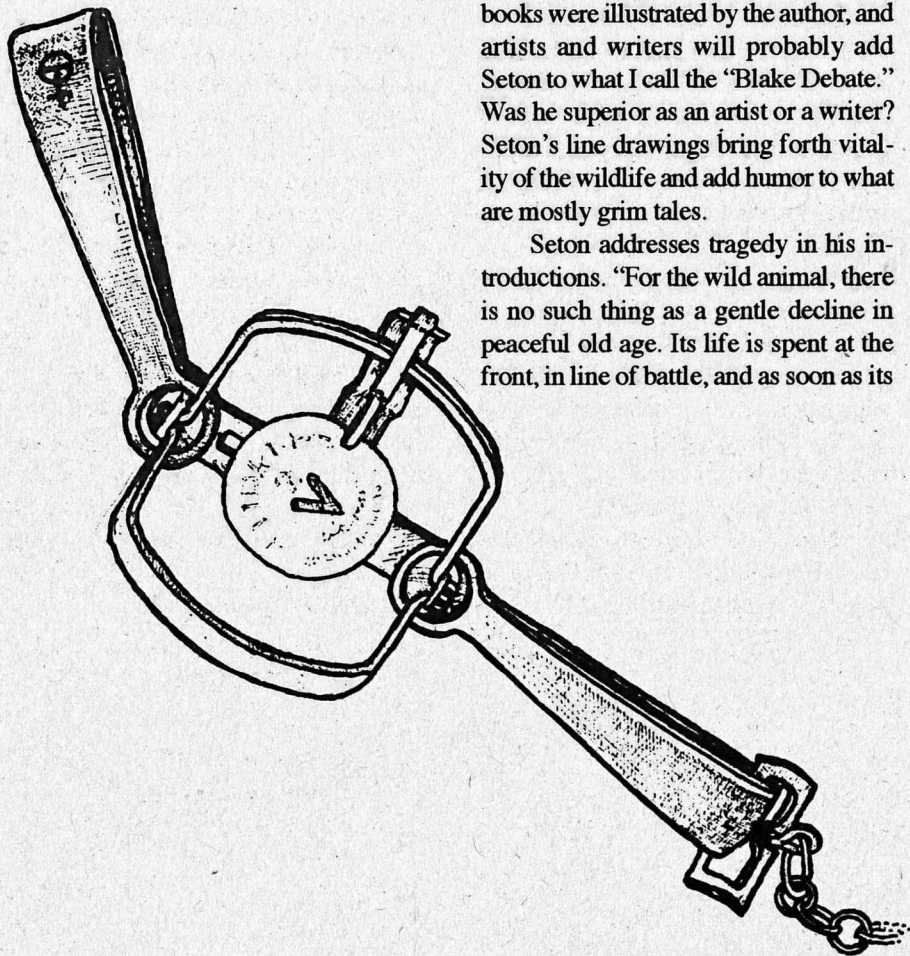


illustration by R. Waldmire

WHO BUILT THE HIGHWAY?

by Norman Bate; New York: Charles Scribner's Sons; 1953.

One of the persistent myths of conservation biology is that roads are harmful to biodiversity.* Wildlife biologists worry about roads providing access to poachers. Fisheries biologists are concerned that sediments washing from road cuts might degrade salmon and trout habitat. Wilderness enthusiasts claim that roads diminish their experience of primeval Nature. When was the last time anyone considered the positive contributions of a decent highway system to human society?

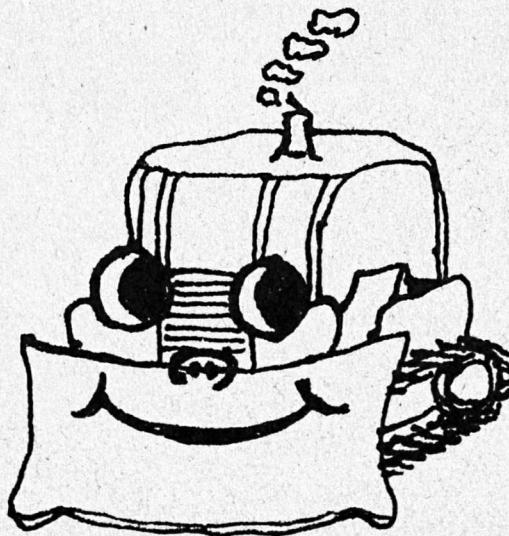
One of the last times seems to have been in 1953. This well-researched and illustrated book by Norman Bate begins with the immortal question: "The Hills whispered to the Valleys, 'Why hasn't someone built a highway from the Big Town to the Little Town?'" As the story unfolds, we learn that the people of the Big Town and Little Town were finally enlightened to the need for a road to link them and provide for commerce. Thinking themselves too weak to build the road all by themselves, the people wisely noted that "there are machines that are bigger and stronger than all of us. They will build our highway."

And so the people called on the machines. The bulk of this book recounts the arguments made by sundry pieces of road-building equipment—Bulldozer, Earthmover, Powershovel, Tampers, Grader, Truck, Roller, Subgrader, Roadlayer, Finishers—in support of their unique contributions to the task at hand. Bulldozer makes the compelling claim, lavishly illustrated by Bate: "I'll build your highway. I'll scrape away the dirt and stones with my heavy steel blade. I'll push down the trees and move the rocks that stand in the way.... Nothing can stop me from building your highway." Yet this claim does not daunt the mighty Roadlayer, who replies "I can do

more work than Bulldozer, Earthmover, or Shovel. I can work faster than the Tampers or Grader... I AM BIGGER THAN ALL OF THEM" (emphasis in the original). In the end, the machines demonstrated to each other the fine work they could do, cooperating in spite of themselves. This is the moral of the story: Put a bunch of powerful machines together, challenge them with a noble task, and great things will come of it.

I found the arguments in this book far more convincing than all the silly diatribe that environmentalists and other communists enlist against roads; and in stark contrast to the doom-and-gloom preachings of those who oppose progress, this book has a happy ending—a portrait of a full moon rising over a beautiful new highway through the hills and valleys of America.

Reviewed by Diamondback (The reviewer wishes to thank Buck Young for bringing this book to his attention. It effectively replaces the obsolete Earth First! Roads Tabloid as the authoritative text on the topic. The volume now resides within The Wildlands Project Science Library in Corvallis, Oregon.)



*I'll build your highway.
I'll scrape away the dirt
and stones with my
heavy steel blade. I'll
push down the trees and
move the rocks that stand
in the way.... Nothing
can stop me from
building your highway.*

*Editor's note: The reader is expected not to shudder aghast at this review but to fairly chortle, and thus to be disabused of the notion that conservation biologists are a humorless lot. —JD

Announcements

Heartwood Forest Council

Heartwood has chosen Camp Orr, on the upper Buffalo National River, as the location for their 3rd annual Forest Council, May 27-30. Camp Orr is west of Jasper, Arkansas (on Highway 74).

The conference will attract Heartwood activists, newcomers, and others from throughout the Central Hardwood Forests of the Midwest. It will include workshops on coalitions, media, forest watching, water quality and more. There will also be plenty of fun with interpretive hikes, games, live entertainment and story telling.

For more information contact:

Heartwood: c/o Andy Mahler, R3 Box 402, Paoli, In 47454.

Ozarks Heartwood : c/o Charles Phillips, POB 24, Boonville, MO 65233.

Herb Culver: HC#62 Box 665 Deer, AR 72628.

Forest Reform Rally Planned

The 8th Annual Forest Reform Rally (formerly National Forest Reform Pow Wow) is coming together for 1994. Hosted by Western Ancient Forest Campaign (WAFC), Oregon Natural Resources Council, and the Forest Reform Network, the conference is scheduled for June 16-19 at the Eastern Oregon State College in La Grande, Oregon. The conference will provide an opportunity for grassroots forest activists across the country to strategize and strengthen the national effort to end the continued abuse of our nation's forests. For information, contact WAFC, 1400 16th St. NW, Suite 294, Washington, D.C., 20036.

Documenting Death

Wildlife Damage Review is offering a report on illegal and unscrupulous activities of the Animal Damage Control (ADC) program by activists who have been working on this issue for years. It explains why ADC is not a reformable agency, and why it should be dismantled. The report, titled *Waste, Fraud and Abuse in the US Animal Damage Control Program*, was compiled and written by Pat Wolff of New West Research. If you are interested, send \$10 to: Wildlife Damage Review, POB 85218, Tucson, AZ 85754; (602)884-0883.

Animal Damage Control: How Your Tax Dollars Subsidize Agri-Business by Killing and Harassing America's Wildlife is a well-researched document just produced by the Environmental Clinic Program at the University of Montana in conjunction with Predator Project. It is an examination of ADC's budget in the 17 Western states, where most of their money is spent. The report examines how the program is funded on the federal and state levels, how to better understand the complex political and institutional systems that control these funds, and how the public can influence the appropriation and expenditure of those funds. For a copy send \$10 to: Predator Project, POB 6733, Bozeman, MT 59771; (406)587-3389.



Announcements

Seeds Of Hope: Reclaiming The Forest

An Arctic to Amazonia Congress at The School For International Training Brattleboro, Vermont October 13-17, 1994

Arctic to Amazonia Alliance will convene an international gathering examining community forestry. The first in a series called Seeds of Hope, Reclaiming the Forests will broaden the discussion on the forests of the northeastern United States and southeastern Canada.

Indigenous delegates from forest-based cultures around the world will present accounts of successful contemporary projects which can provide insights and specific techniques applicable to our region. Presentations will concentrate on five subject areas: (1) reclaiming control over local forests, (2) restoring damaged forest ecosystems, (3) creation of community economic programs and local businesses based on production of sustainable forest products, (4) support for groups on the front lines of the forest struggle, and (5) a look at foundations, technical services, and training available to help communities in their organizing. We also hope to find gallery space to present an exhibit of art connected to woodlands culture, which we will run concurrently with the congress.

We are seeking Indigenous persons and organizations interested in joining the conference advisory group/steering committee, as well as organizations to co-sponsor the congress. Contact: Erik van Lennep, Arctic to Amazonia Alliance POB 73, Strafford, VT 05072; (802) 765-4337

Use Tree Free Paper

The newsletters of SWAN (Superior Wilderness Action Network) are printed on papers made from plants other than trees. Any group—any person—can get and use such paper, and the more widely and quickly this becomes the norm, the sooner forests will cease to be viewed as fiber farms for paper manufacturers.

The most widely available of alternative papers is made from hemp or combinations of hemp and wheat straw.

Such paper can be ordered from Tree Free Ecopaper, One World Trade Center, 121 SW Salmon, Suite 1100, Portland, OR 97204, 800/775-0225. Another source is the Ohio Hempery, 14 N. Court St., #328, Athens, OH 45701, 800/BUY-HEMP.

Another option is kenaf paper, made from a Central American plant. Because it's imported it costs a bit more, but it performs a bit better where printing is to be done on both sides of a sheet. The best way to stay abreast of what is available in alternative papers is to ask local print shops, because they maintain contact with suppliers. The principal US source for kenaf paper is KP Products, Inc., POB 4795, Albuquerque, NM 87196-4795, 505/294-0293 (ask for Tom Rymza).

Consumers can request that firms they deal with use alternative papers. If enough people ask, they will make the shift. Copy shops should make tree-free papers an option. Kinkos shops on the West Coast already do.

The technology for turning trees into paper didn't develop until the 19th century. Before that time, all paper was tree-free, including that used for such documents as the Declaration of Independence and the US Constitution, both of which are reported to be of hemp. The trees-to-paper technology has been a disaster from the standpoint of biodiversity.

Whether we go toward hemp or kenaf or some other fibrous plant, a return to tree-free paper is long overdue. Such a shift will be a giant step toward saving forest ecosystems. So start using tree-free papers, and tell all your friends to do likewise.

SWAN c/o Biology Dept., University of Wisconsin-Oshkosh, Oshkosh, WI 54901

Deep Ecology Workshop

A Deep Ecology Workshop, sponsored by the Way of the Mountain Center and The Aspen Center for Environmental Studies, will take place July 18-22, 1994. Academic credit: 3 CEUs available. Workshop presenters include: Dolores LaChapelle, George

Sessions, Max Oelschlaeger, Penny Woodward and Jody Cardamone.

For more information write: Jody Cardamone, Aspen Center for Environmental Studies, POB 8777, Aspen, CO 81612.

Dedicated Virginian Dies

Larry Hammond, a dedicated Virginian For Wilderness and Earth First'er, died January 24, 1994. Larry and his wife, Crickett, are known far and wide as protectors of Central Appalachian wildlands and as bureaucratic gadflies, particularly of the US Forest Service. Larry was an audacious proponent and practitioner of direct action despite his advanced age. In the early eighties the Hammonds were instrumental in stopping some large timber sales on Mill Mountain in the vicinity of Goshen, Virginia and in 1988 repeated the performance to save a rare mountain pond on Pond Ridge. Larry is sadly missed by all forest people. However, we look forward to Crickett's return to our ranks after she recuperates from nursing Larry. Crickett lives at Route 1, Box 70A, Goshen, VA., 24439.

Institute for Bioregional Studies

The Institute for Bioregional Studies offers a three week residential program in Community Development and a two year program in Bioregional Resource Management. Studies include: Environmental Planning and Community Self-Reliance. College credit available. For information send \$5 to: IBS, 449 University Ave, Suite 126 Charlottetown, Prince Edward Island, Canada, C1A 8K3; (902) 892-9578.

Environmental Studies Association of Canada

The Environmental Studies Association of Canada (ESAC) is a learned society formed to further discussion, scholarship, research and teaching in the field of environmental studies. ESAC is a non-profit, federally incorporated, bilingual organization. ESAC will produce a newsletter twice a year with information about conferences, coming events,

positions, and research projects. Membership benefits currently include the newsletter, the directory and voting rights. ESAC will hold its first Learned Conference on 14 June 1994 in Calgary, and is now looking for papers and presentations addressing human/environment relationships, and political, cultural, ethical, epistemological, gender and other implications. Please send titles and abstracts for papers immediately to: Mark Lutes, Chair, Learned Organizing Committee, Environmental Studies Association of Canada, c/o Faculty of Environmental Studies, 355 Lumbers Building, York University, 4700 Keele Street, North York, Ontario, Canada, M3J 1P3.

Walden Forever Wild

Since 1980, Walden Forever Wild, Inc. (WFW), has been working to get the Walden Pond Reservation, in Concord, Massachusetts, into Sanctuary status. Walden Pond is in a glacial kettle hole, with very fragile, loose dry soil slopes all around it. Walden is a prototype of wild spots near cities which need protection. The support of women of America is needed for this effort. You can help by sending your name, address and a \$1 registration fee to WFW. If you wish to add a donation, make your check payable to Walden Forever Wild, Inc.

and add at the bottom left the words *Women for Walden*. WFW, Box 275, Concord, MA, 01742

North American Savannas and Barrens Conference

The North American Savannas and Barrens conference, *Living in the Edge*, will be held 15-16 October 1994 at Illinois State University, Normal, IL. Persons interested in presenting a paper or poster at the conference should submit an original and two copies of an abstract to Dr. James Fralish, Department of Forestry, Southern Illinois University, Carbondale, IL, 62901; (618)453-7466. Papers summarizing existing research information on plants or animals of a savanna/barren type are encouraged. For information on conference topics, fees and field trips contact: Dr. Roger Anderson, 4120 Department of Biological Sciences, Illinois State University, Normal, IL, 61790-4120; (309)438-2653.

Talking Gourds

Talking Gourds: A Celebration of Poetry and Performing Arts will be held June 10-12, 1994, on Faraway Ranch at the foot of the Wilson range in Telluride, Colorado. Special guests include philosopher, writer, and teacher Dolores LaChapelle and Gary Lawless, *Wild Earth* poetry co-editor and publisher of

Blackberry Books. Register by May 1, 1994. For more information contact Art Goodtimes (303-327-4767), E-mail: goodtime@csn.org, Telluride Writers Guild, Box 160, Norwood, CO 81423.

Forests Activists Retreat

Dakubetede Environmental Education Programs (D.E.E.P.) is sponsoring a Forest Activists Retreat, Memorial Day Weekend May 28-30 at Trillium Farm, an intentional community nearly surrounded by a proposed wilderness in the eastern Siskiyou Mountains. Activists will camp with their families and friends along the little Applegate River; organic meals and child care are provided. Siskiyou eco-minstrels will entertain at campfire concerts. Academic credit is available for optional field trip workshops on riparian ecology, forest ecology, and natural history. Llama hikes will be offered.

Cost of the Retreat is \$100 per person if registered before April 21 (John Muir's Birthday), \$175 after April 21; children under 12 free, teens 12-17 half price. This Retreat is a benefit to create a Deep Ecology Land Trust at Trillium Farm to permanently protect the land and an environmentally sensible community lifestyle. For information write to D.E.E.P., P.O. Box 1377, Ashland, OR 97520.



ABOUT SUBMISSIONS

Wild Earth welcomes submissions. Poems should be sent directly to our Poetry Editors, Art Goodtimes (Box 1008, Telluride, CO 81435) and Gary Lawless (Gulf of Maine Books, 61 Maine St, Brunswick, ME 04011). Poets should realize that we receive hundreds more poems each quarter than we can publish.

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. Those who use a computer should include a copy on disk. We use Macintosh (3.5" disk) but can convert from PCs. Writers who want their material returned should enclose a self-addressed stamped envelope. Deadlines are two months before the changes in seasons (e.g., 10-20 for winter issue).

Articles, if accepted, may be edited down for space or clarity, though if substantive changes are made, the author's approval will be sought. 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 Executive Editor, 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 properly credit the articles.

In matters of style, we follow the *Chicago Manual of Style* loosely and Strunk's & 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).
2. Thou shalt not verbalize nouns (Abbey 1988).
3. Do not affect a breezy manner (Strunk & White 1959).
4. Watch your antecedents (Davis 1988).
5. Include a goddam floppy (Butler 1992).
6. Mix drinks, not metaphors (Davis 1993).



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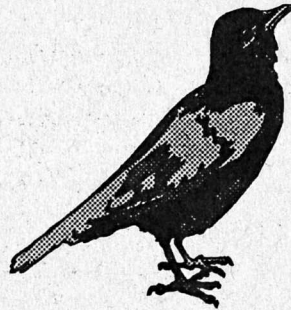


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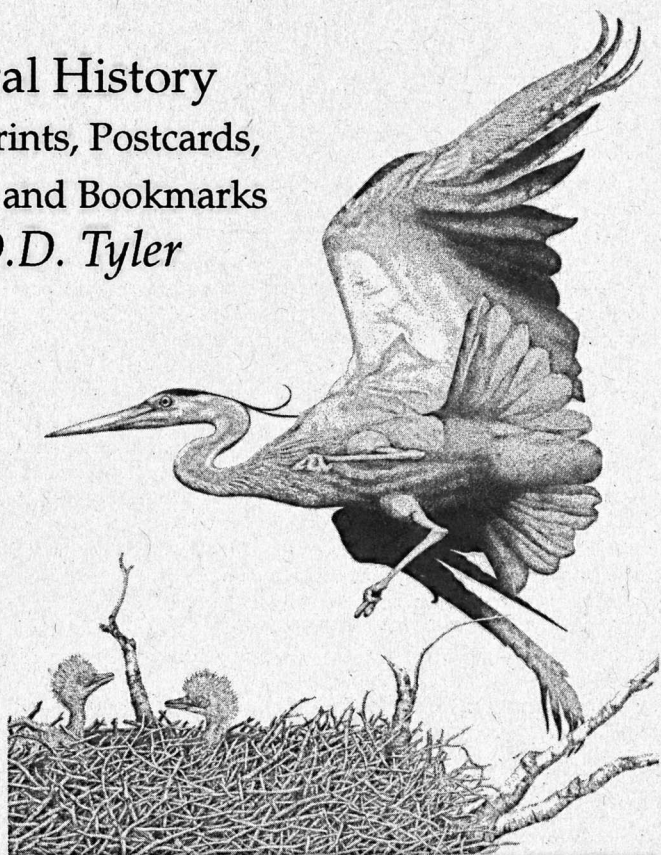


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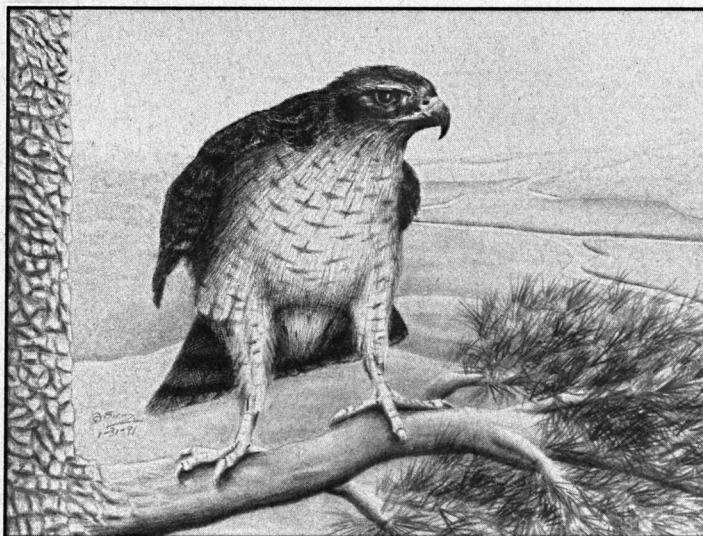
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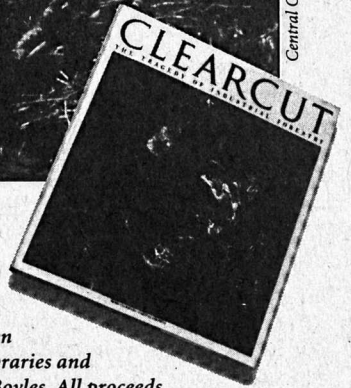
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Central Ontario: photo by Barry Tessman

This month, forestry activists from across the country are delivering copies of **CLEARCUT: THE TRAGEDY OF INDUSTRIAL FORESTRY** to thousands of public officials in Canada and the U.S. This new book documents the full scale and terrifying impact of current industrial forestry policies. **CLEARCUT** contains 300 pages including 105 color plates with startling images of clearcut landscapes across North America. The photos are by some of North America's great nature photographers, including Galen Rowell, Daniel Dancer, and Robert Glenn Ketchum. Fifteen essays from leading conservation biologists are included. Now **CLEARCUT** is also available in many libraries and bookstores. Publisher: Sierra Club Books/Earth Island Press. Editor: Bill Devall. Photo Editor: Edgar Boyles. All proceeds go directly to the campaign against industrial forestry.



This is a book about "industrial forestry," a process that combines the world view of the industrialist with the logic of the assembly line for its final assault on the earth's forests. In these startling images of clearcuts—from Alaska to Nova Scotia, from Maine to California—we see the ultimate expression of industrial consciousness: landscapes of massacre, battlefields in the war upon nature and life.

One hundred and fifty photographs and fifteen essays by some of the world's most celebrated nature photographers, writers, and scientists take us to once-magnificent forests and wilderness areas where few travelers have gone, save for those with chainsaws. We see what happens behind the cosmetic rows of trees along the highways ("beauty strips") and we grasp the pathetic, cynical public relations of corporate "tree farms" that seek to mask a terrible reality. The accumulation of shocking imagery, with its awful content but acute presentation, leaves us stunned.

But wiser and activated.

Finally, we may appreciate that what's happening in our forests is only one result, though a vivid one, of the rampant industrial mentality expressed in all modern activity. A mentality that views nature as a mere raw material, awaiting conversion to commodity, and that assumes humans to be superior to all other life. It is this failed paradigm that has led us to the great ecological crisis we now face.

We see it in the death of lakes and rivers, the toxic wastes in our rural lands, the rate of species extinction, the holes in our atmosphere, and the sacrifice of the last wild areas to industrial development. *But we see it most clearly in the gripping sight of clearcut forests.*

It does not have to be like this. **CLEARCUT** argues that in every region there are alternatives to this destruction. Breaking with the industrial mentality can be done successfully, once we recognize the limits of nature, and begin to articulate the appropriate way for

humans to dwell on the earth. This book makes a powerful case for facing the realities of our time, and changing them.

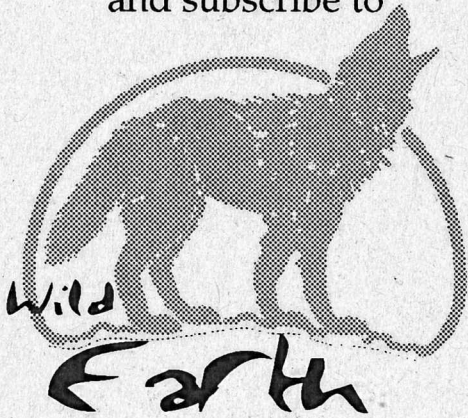
You may take part in this project in two ways. *First*, contact one of the participating organizations by calling the number below. *Second*, have a look at **CLEARCUT: THE TRAGEDY OF INDUSTRIAL FORESTRY**. Now available in libraries and bookstores. Thank you.



Central Oregon: photo by Elizabeth Ferry

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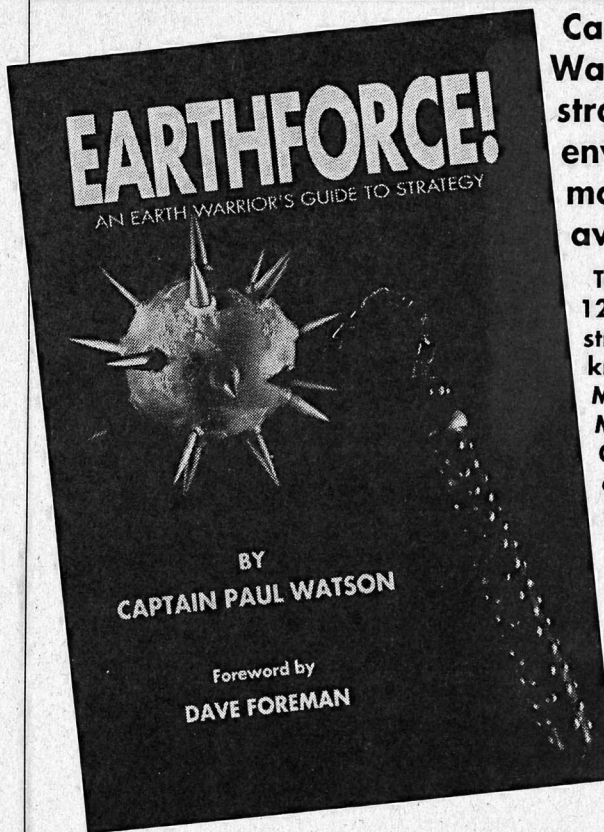
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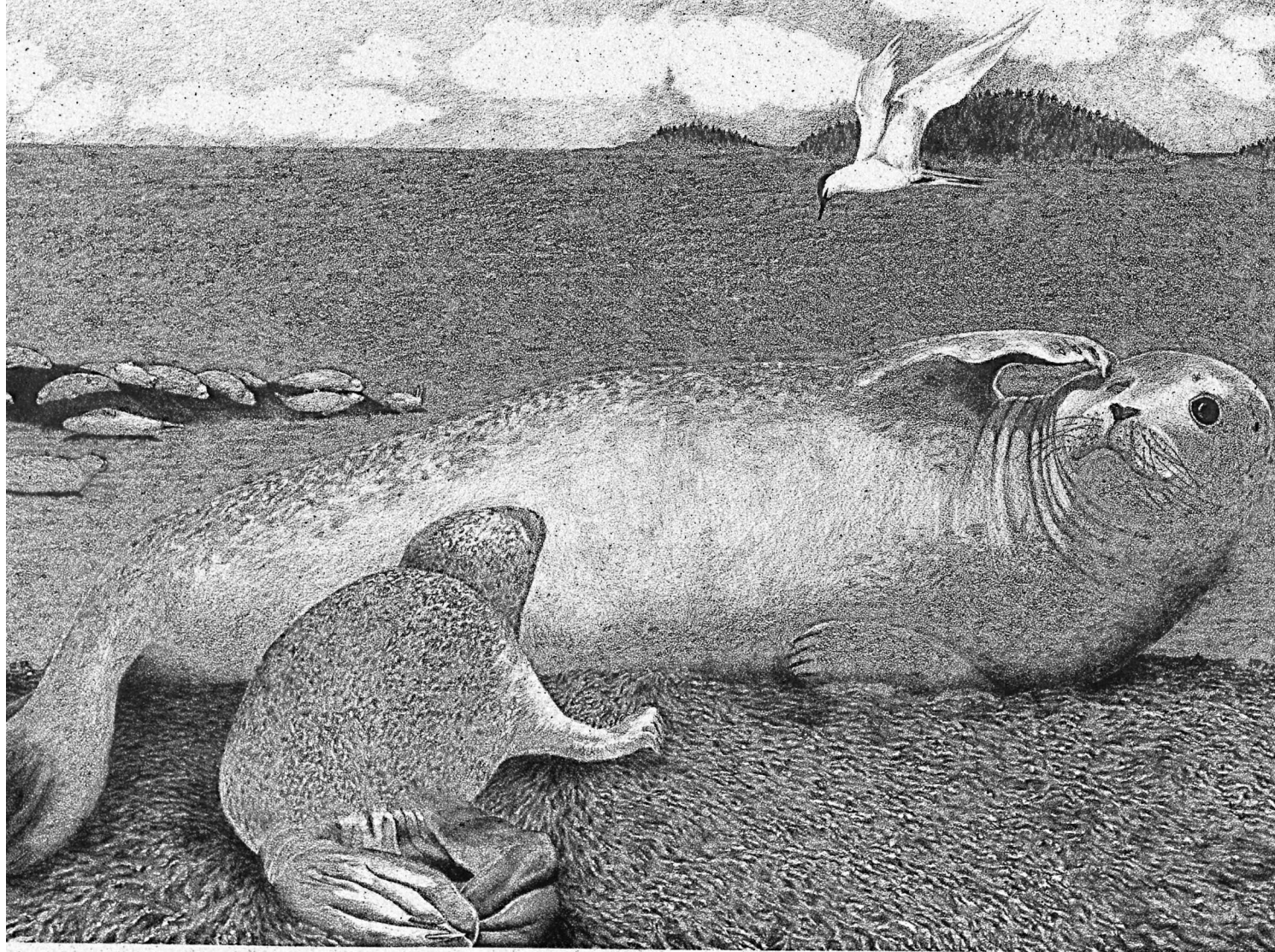
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Harbor Seal (*Phoca vitulina*)

drawn by D.D. Tyler



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A relatively common—though uncommonly comely—pinniped often seen lounging on West Coast beaches, the Harbor Seal has a range including most of the North Atlantic and North Pacific, where it eats benthic and pelagic fish. Harbor Seals weigh up to 170 kilograms (males 185 kg). This seal's world population is these days only 300,000–400,000 (not many more than Yonkers and Hackensack have humans). Males may live to 26; females longer, naturally, to 32 sometimes, if not eaten by Orcas or sharks. The coat is pale to dark gray (or grey, in British waters). Canada enjoys a few freshwater populations, and elsewhere Harbor Seals may swim up rivers.

Phoca vitulina is the largest yet least well-known of the predators extirpated from the Adirondacks area. The Greater Laurentian Region Wildlands Project hopes to see the Harbor Seal restored to Lake Champlain once that freshwater body is again truly fresh.

The Harbor Seal's main enemy is the usual, *Homo sapiens*, as manifested in pollution, fishing nets, motor boats, and the like. A looming threat for marine mammals in general is the proposed weakening of the Marine Mammal Protection Act. To learn how to combat this threat, and maintain protection for cetaceans, pinnipeds, and Polar Bears, contact the Atlantic Biodiversity Center, POB 160, Nassau, DE 19969. —JD

Maine artist D.D. Tyler is well known for the distinctive style and scientific accuracy she brings to her natural history artwork. Her fifteen book illustration credits include *Bears in the Wild*, *Keepers of the Animals*, several field guides, and children's books (three of which received Outstanding Science Book Awards).

She and her husband, Hank, operate Tyler Publishing, which distributes D.D.'s natural history posters, prints, notecards, bookmarks, and postcards (P.O. Box 243, Augusta, ME 04332). —TB



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