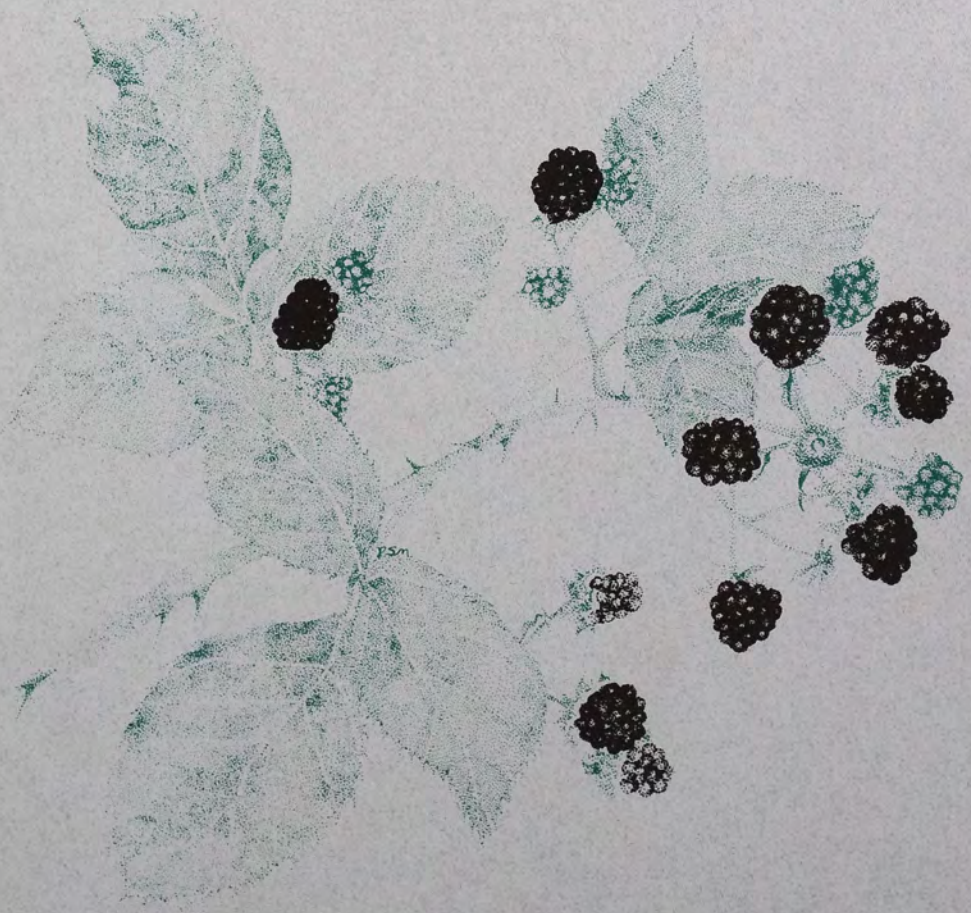
Wild EARTH

Volume 3, Number 2

Summer 1993

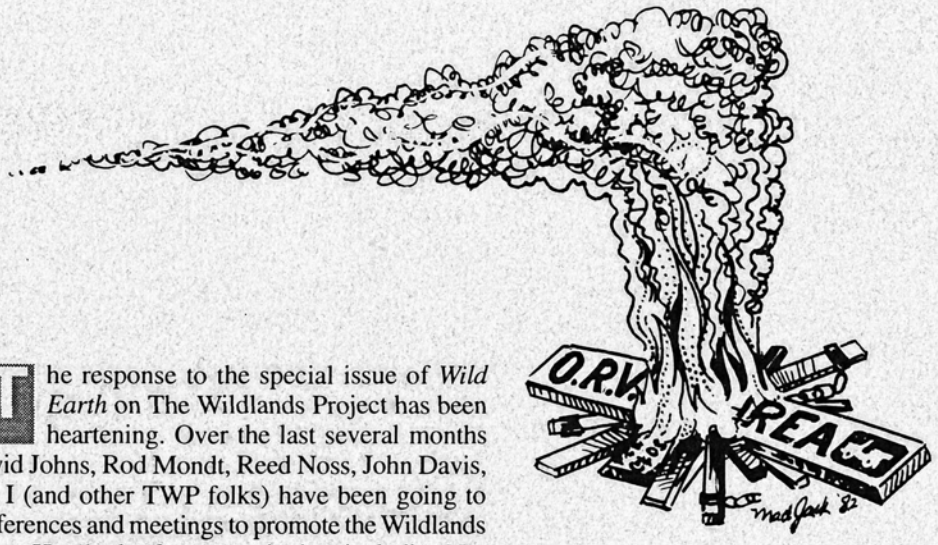


In this issue:

Imperiled Predators • Eastern Forest Recovery
Alabama Wilderness • Salmon/Selway Ecosystem
and much more...

$7

Around The Campfire



The response to the special issue of *Wild Earth* on The Wildlands Project has been heartening. Over the last several months David Johns, Rod Mondt, Reed Noss, John Davis, and I (and other TWP folks) have been going to conferences and meetings to promote the Wildlands vision. Hundreds of conservationists, including Nature Conservancy state directors, DC lobbyists, Forest Service employees, and grassroots activists have told us how the idea of the North American Wilderness Recovery Strategy has inspired and energized them.

But some (including a few foundations to which we've applied for grants) have yawned. Oh, it's a challenging idea, but isn't it a bit quixotic? Really! Be realistic. What practical or immediate application does it have?

Is The Wildlands Project just Wilderness in the sky?

Without going into detail, and without constructing an elaborate sand castle justifying visionary approaches, let me offer a handful of immediate practical benefits of The Wildlands Project.

TWP is a lonely hearts club for conservation biologists. We're like a computer dating service to introduce them to conservation groups who want to use their knowledge and expertise.

We're a little red schoolhouse to encourage conservation groups to learn the theories and applications of conservation biology. This knowledge will strengthen our proposals, make us stronger and more convincing in fighting local threats, and help us defend the notion of Wilderness and Parks based on biodiversity protection rather than on arguments grounded in scenery and primitive recreation. In short, we are marrying conservation biology and grassroots conservation activism.

TWP is encouraging regional conservation groups to apply the new insights of conservation biology to on-the-ground preservation proposals—such as for biological corridors between existing Wilderness Areas and National Parks. We will be drawing up guidelines on getting core wilderness, biological corridor, buffer zone, wilderness recovery alternatives into the new generation of Forest Plans. A major project for TWP will be to help coordinate a national effort of local groups proposing such conservation biology alternatives for their National Forests.

We will encourage the formation of regional conservation groups explicitly set up to work for their part of the Wildlands vision. The mushrooming of such conservation biology-oriented groups will help make conservation biology the heartbeat of modern conservation.

The sketching of a continental wilderness recovery network will allow local conservation groups to see where their immediate issues fit into the continental scheme. By taking an approach derived from island biogeography, we hope to bridge artificial barriers: different agency boundaries, private land, and international borders.

Our niche is the entire continent, not just the United States. We hope our approach demonstrates to all US and Canadian conservationists that we have as much (or more) to learn from Mexican and Central American conservationists as we have to offer them.

continued on pg. 2

WILD EARTH

SUMMER 1993 VOLUME 3, NUMBER 2

WILD EARTH (ISSN 1055-1166) is published quarterly by the Cenozoic Society, Inc., POB 455, Richmond, VT 05477. The Cenozoic Society is a non-profit educational, scientific, and charitable corporation.

Cenozoic Society Board: Tom Butler (VT), John Davis (NY), Dave Foreman (AZ), David Johns (OR), Reed Noss (OR), Kris Sommerville (CO).

Membership in the Cenozoic Society is open to the public and includes a subscription to *Wild Earth*. Non-membership and institutional subscriptions are also available. The basic rate for individual membership subscriptions is $25; library/institutional subscriptions are $30. Subscriptions to Canada and Mexico are $30 per year, overseas subscriptions are $35 (surface mail) or $40 (air mail).

POSTMASTER: send address changes to *Wild Earth*, POB 455, Richmond, VT 05477.

All editorial and membership correspondence should be sent to *Wild Earth*, POB 455, Richmond, VT 05477.

Submissions of manuscripts and artwork should be sent to the Editor or Art Director, *Wild Earth*, POB 455, Richmond, VT 05477. Writers who use computers **should** include a disk (we prefer Mac to MS-DOS) as well as paper copies. Queries in advance of submission are recommended. Writers and artists who want their work returned should include a stamped, self-addressed envelope. *Wild Earth* assumes no responsibility for unsolicited materials.

Wild Earth accepts a limited amount of advertising that is compatible with the policies and goals of the Cenozoic Society. For rates/information contact Marcia Cary at *Wild Earth*, (315) 379-9940.

Wild Earth is available on microfilm from University Microfilms, Inc., 300 North Zeeb Rd., Ann Arbor, Michigan 48106-1346.

Articles appearing in this journal are indexed in ENVIRONMENTAL PERIODICALS BIBLIOGRAPHY. *Wild Earth* is printed on recycled paper.

On the cover: *Blackberries* by Peggy Sue McRae

It's What We Do...

By being a clearinghouse for the scores of independent groups making up the New Conservation Movement, we hope to direct more funding their way, facilitate cooperation among groups, and strengthen the influence of the New Conservation Movement within the whole conservation/"natural resources" community.

And, by developing a continental wilderness recovery proposal solidly based in science and supported by grassroots groups, we will set a new conservation agenda. Whether they condemn it or praise it, whether they go into rapture or apoplexy over it, all conservation groups, government agencies, and industry groups will circle their discussions around our vision.

Is The Wildlands Project practical?

Does a bear shit in the woods?

○

The Wildlands Project, by the way, is looking for additional staff people. We want to hire a Ph.D. level ecologist to work with Dr. Reed Noss; we want to hire an office manager; and we want interns. See the announcements in this issue for details.

○

My big project for the summer is to draft a vision map for The Wildlands Project. The map will identify the existing and potential core wilderness complexes, suggest the most practical corridors between them, and point out regions where little has been done or is known regarding wildlands. For a glimpse of how our North American Wilderness Recovery plan will unfold, look at my article on Eastern Forest Recovery in this issue. It's excerpted from my chapter in the soon-to-be released *CLEARCUT* book from Doug Tompkins and Bill Devall.

Also in this issue, Howie Wolke focuses on the oft-overlooked largest wilderness complex in the lower 48—the Salmon/Selway country. Old growth expert Robert Leverett wanders the wildwood of the Southern Appalachians. And we have a proposal for Wilderness Recovery in Alabama. But I'm just offering you whiffs off the barbecue. We're serving up a real feast this issue. Dig in.

Happy Trails.

—Dave Foreman

Moonshine Park, Blue Range Primitive Area, AZ

Wild Earth necessarily leaves most quickly-dated conservation news to other periodicals. We receive far more material than we can print; and as a quarterly, we try to restrict ourselves to articles of timeless import. So in the few column centimeters available here, I simply want to call attention to several matters we were unable to cover in this issue despite their great importance. (The groups mentioned below have all been profiled in past issues of *WE*.)

Clayoquot Sound and many other of British Columbia's temperate and boreal forest tracts may be killed this summer unless forest defenders' protests and blockades succeed. Friends of Clayoquot Sound and Western Canada Wilderness Committee are among the groups leading the defense.

Ned Fritz of Forest Reform Network has won a potentially precedent-setting lawsuit against the Forest Service in Texas. Activists may be able to use the precedent to stop clearcuts on National Forests throughout the country.

Representative Kennedy caved in to pressure from a Montana congressman and decided not to introduce the Northern Rockies Ecosystem Protection Act. The Alliance for the Wild Rockies hopes to convince Representative Maurice Hinchey (D-NY) to introduce the Act.

The Society for Conservation Biology conference earlier this month considerably advanced The Wildlands Project. The Project's symposium attracted more participants and enthusiasm than any other working session at the conference.

Wild Earth and The Wildlands Project also made presentations at meetings of The Land Institute, Society for Ecological Restoration, Natural Areas Association, and other groups keen on habitat. Links between conservation activists, conservation biologists, and ecosystem restorationists are growing strong and fruitful.

—John Davis; Summer Solstice; Year of our Lord, Nineteen Hundred and Ninety-three

It is time for a change. The Canton delegation of *Wild Earth* has decided to move. Beginning 1 August 1993, *Wild Earth* will publish from rural Vermont. All correspondence should be sent to **PO Box 455, Richmond, VT 05477.** The new phone number is not yet known but will be available in August by calling (315) 379-9940. Some confusion is bound to result from this move—there will be fliers, subscription forms and back issues floating around with the old address. We believe that merging the now separate editorial and production staffs of the magazine will result in far greater efficiency, and be well worth the temporary inconvenience. Of course, any mail sent to Canton will be forwarded to our new address. Readers can help us minimize confusion by pointing out the new address to others who may miss this announcement (in other words: talk it up for us).

Another mission for each of you, which could increase our membership significantly, is to find one person whom you feel could benefit by reading *WE*. By giving them a gift subscription, or just telling them of *Wild Earth* and handing them a current subscription form, you will help ensure the continued effectiveness of *Wild Earth*. Our niche is fairly small—but the way for us to exploit it fully is for current readers to proselytize. Few magazines depend on subscriptions for most of their funding. Because *WE*, by policy, only runs a few advertisements, consistent with our conservation ideals, income from ads is limited; subscription income is essential.

Canton has been good to us and we do not leave New York's North Country without nostalgia. In fact, we don't really leave it. We will remain active in Adirondack issues through the Buy Back The Dacks fund, letter writing, and a forthcoming Adirondack Wildlands Proposal. But for the office, it's off to Vermont...

—Marcia Cary

...*Yeah,* It Is

In May, after a hike in Daniel Boone National Forest's magnificent Red River Gorge, John, Mary and I ventured to the Forest Reform Pow Wow, this year held in the Knobs Region of Kentucky. Arriving a little late, I sauntered into the chapel with Rod Mondt, The Wildlands Project programs coordinator, just as Pow Wow patriarch Ned Fritz said "But" and the room full of people shouted back at him "The clearcutting continues!" I looked at Rod in surprise, wondering whether everyone would next shave their heads and head to the airports for rounds of synchronized chanting. On the contrary, I soon found myself surrounded by hard-working grassroots activists dedicated to preserving and recovering wilderness. Heartwood (see back cover) deserves many thanks for their fantastic job of organizing the gathering.

Among the focuses of the Pow Wow were ancient forests. Many groups are devoted to protecting the Northwest forests; but I would like to highlight the Native Forest Council, and strongly encourage readers to donate time and money to NFC efforts (see Victor Rozek's article in this issue). NFC's Zero Cut Solution is essential for the preservation of the Pacific Northwest forests and, I believe, the best answer yet offered to the nation-wide crisis in our forests.

Across the country, Save America's Forests in DC is working to pass HB 1164, which would stop clearcutting on all National Forests and other federal lands. SAF has issued an open invitiation for individuals visiting Washington to receive instruction in lobbying. SAF will provide budding citizen lobbyists with background information on pertinent legislation. I urge readers to take advantage of this opportunity.

Enjoy the issue, enjoy summer, and I hope to see you all at the Dacks Bike-a-thon. (See Announcements.)

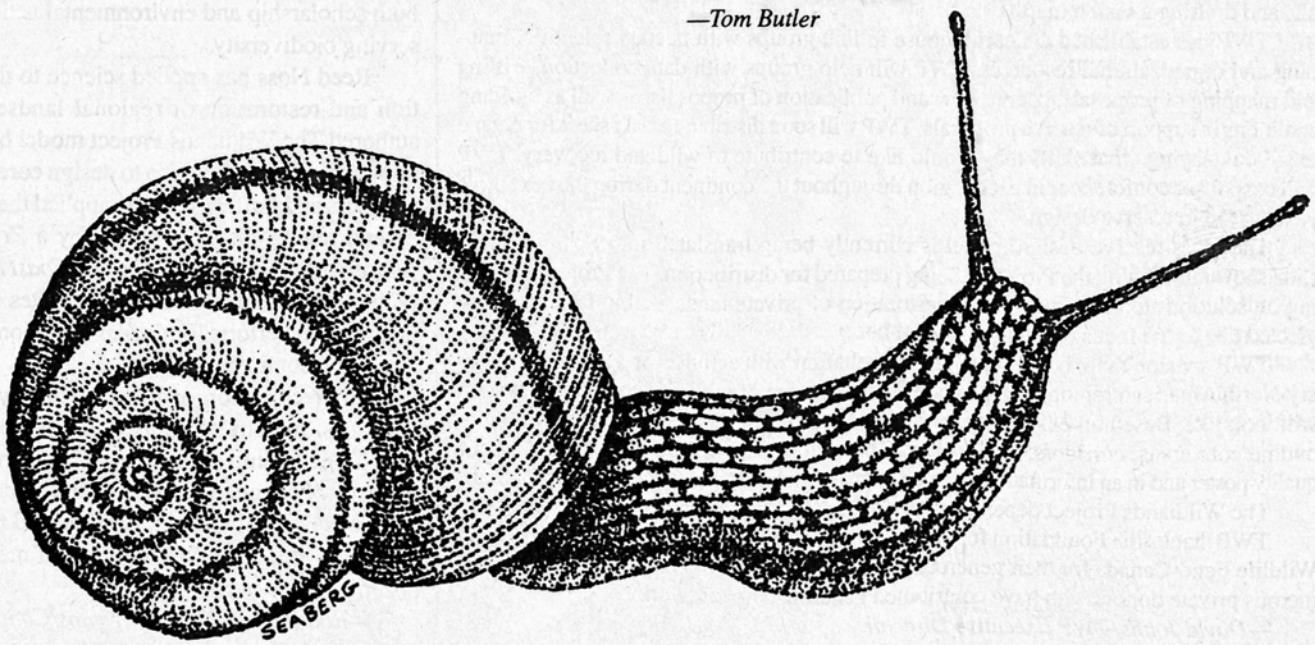
—Kathleen Fitzgerald

Somewhere, a computer believes I'm a stamp collecting recreational vehicle enthusiast who loves to bowl. It's probably only a matter of time before it instructs its direct marketing masters to sell me philatelic supplies, monogrammed bowling shirts and fuzzy dice for the ol' Winnebago. Alas, their pitches are unlikely to result in a sale—I was untruthful when describing my income and hobbies when filling out the warranty card the last time I purchased so-called durable goods.

Wild Earth is asking readers to be more candid with us—no, not about educational background and leisure activities—but about how well or poorly the magazine is serving its readership. We need feedback on our performance...on what we're doing well and what needs improvement. Though we often receive favorable notes (and the occasional grumble), we're soliciting thoughtful responses on a few key points: Are we fulfilling the objectives outlined in the mission statement? How can we better serve New Conservation Movement groups and further our common goals? Have we successfully introduced conservation biologists to wildlands activists? Have any such unions birthed babes of protected habitat? How might *Wild Earth* move adynamic mainstream groups to adopt positions based on ecological, not political, reality? What about the magazine's appearance—is the format accessible? Is the information useful? What needs tinkering?

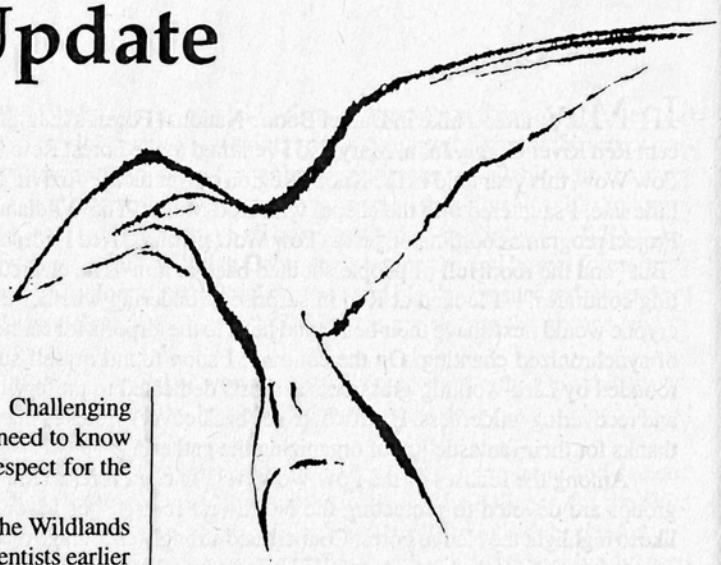
We are ever aware of the costs in energy and resources that producing this periodical entails. By periodically assessing *Wild Earth*'s effectiveness (admittedly a subjective business), we can justify to ourselves the use of those resources, improve our performance, or choose to perish. We think *Wild Earth*—thanks to its large array of talented artists and writers—is doing well at speaking up for untrammeled nature, and for the restoration of wildlands across the continent. Let us know how we can do better.

—Tom Butler



Land Snail by Kurt Seaberg

Wildlands Project Update



Fighting local threats to wildlife is important. Challenging the destruction of biodiversity on the front lines is essential. But we also need to know where we are going. We must have a vision infused with our love and respect for the wild. That is the task of The Wildlands Project.

With the publication of the Special Issue of *Wild Earth* devoted to The Wildlands Project and its distribution to tens of thousands of conservationists and scientists earlier this year, a big step was taken toward establishment of a continental system of reserves to protect and restore all indigenous plant and animal species. Radio and print media interviews were given in response to the press release covering the Special Issue. Articles are appearing in many periodicals this spring and summer. The response of the conservation and scientific communities has ranged from highly supportive to uncontrollably enthusiastic.

Project staff and board members have attended dozens of regional and national meetings to speak about our mission and goals. The support of the environmental community, especially regional grassroots groups, is essential to the development of reserve proposals such as the recently published Oregon Coast Range Plan. (Available from Coast Range Association, POB 148, Newport, OR 97365, $15 or from TWP office.)

The current focus of TWP is two-fold: establishing cooperative relationships with regional groups to develop scientifically sound and conservation-wise reserve proposals, and drafting a vision map.

TWP has established a clearinghouse to link groups with needed scientific, mapping and organizational resources. TWP will help groups with data collection, writing and mapping of proposals, peer review and publication of proposals, as well as building coalitions in support of reserve proposals. TWP will soon distribute a data sheet for people to fill out, saying what skills they would like to contribute to wildland recovery. TWP will cosponsor conferences in each region throughout the continent during the next three years to aid in reserve design.

The Noss reserve design model is currently being translated into Spanish and a slide show introducing the Project is being prepared for distribution. The Project is working on solutions to conservation and restoration of private lands—a big task often neglected due to the focus on public lands.

TWP's vision map, being drawn in consultation with activists and scientists in every North American region, will provide a first glimpse of what the continental system will look like. Based on existing data, which vary widely, the vision map will roughly outline core areas, corridors, and buffers. The vision map will be published as an art quality poster and in an information oriented format, to stimulate work on reserve proposals.

The Wildlands Project depends on your support. Please contribute.

TWP thanks the Foundation for Deep Ecology, the Paradam Foundation and World Wildlife Fund-Canada for their generous support. We are deeply grateful also to the numerous private donors who have contributed generously to our work.

—David Johns, TWP Executive Director

Dr. Reed Noss, Science Director for The Wildlands Project, has been selected as a 1993 Scholar by the Pew Scholars Program in Conservation and the Environment. The Pew award honors those who have demonstrated leadership and commitment to both scholarship and environmental action in preserving biodiversity.

Reed Noss has applied science to the protection and restoration of regional landscapes. He authored The Wildlands Project model being used throughout North America to design core reserves, corridors and buffers, and has applied the model in several regions as exemplified by a *Preliminary Conservation Plan for the Oregon Coast Range.* As TWP Science Director, Reed facilitates conservation planning efforts for dozens of regional groups across the continent.

The recognition of Reed's work by the Pew Scholars Program will allow him, in conjunction with his editorship of the journal Conservation Biology, to continue to provide creative leadership in the protection of biodiversity. Reed and nine other Scholars were chosen from a field of many highly qualified candidates.

—Rod Mondt, TWP Programs Coordinator

• TWP Staff Openings: Please see Announcements on p. 90 for details on positions available at The Wildlands Project.

illustration by Rose Craig

No Harm Done

New Variation on an Old Theme

by Mollie Matteson

She dances along the perimeter of a dew-glimmering, early-morning meadow. Muzzle low to the ground, stop and start, she is keeping a pact with the voles, the pocket gophers, the *Peromyscus*. Long ago, their kind agreed to run, to hide, and to breed maniacally. Her kind assented to search out the slow, the stupid, the unlucky, and to also breed, though not so profligately as those they chased. And all made a bargain with death. Like a moody, glacier-fed river, the rhythms of death could be unpredictable, sudden, sparse, overwhelming. The answer was this: to suck down air and push lungs to bursting, to feed, to leap, to rest, to fight or hide, and always, to make more of one's kind.

The Coyote lifts her head to catch a tantalizing current. The pungent, oily smell emanates from the direction of the gravel road. She knows this line of dust, mud, and weeds brings both good things and bad. Roaring, unstoppable monsters that crush jackrabbits, snakes, deer, even Coyotes. Men that crawl out of the bellies of these monsters, pointing long, odd limbs at her brothers and sisters, and making them dead. But this road seems good to walk on too, when in winter she is weary of falling through snow. And when another is unlucky on this road—a hare smashed by a monster that rolled through in the night—she is in luck, and puts meat in her belly.

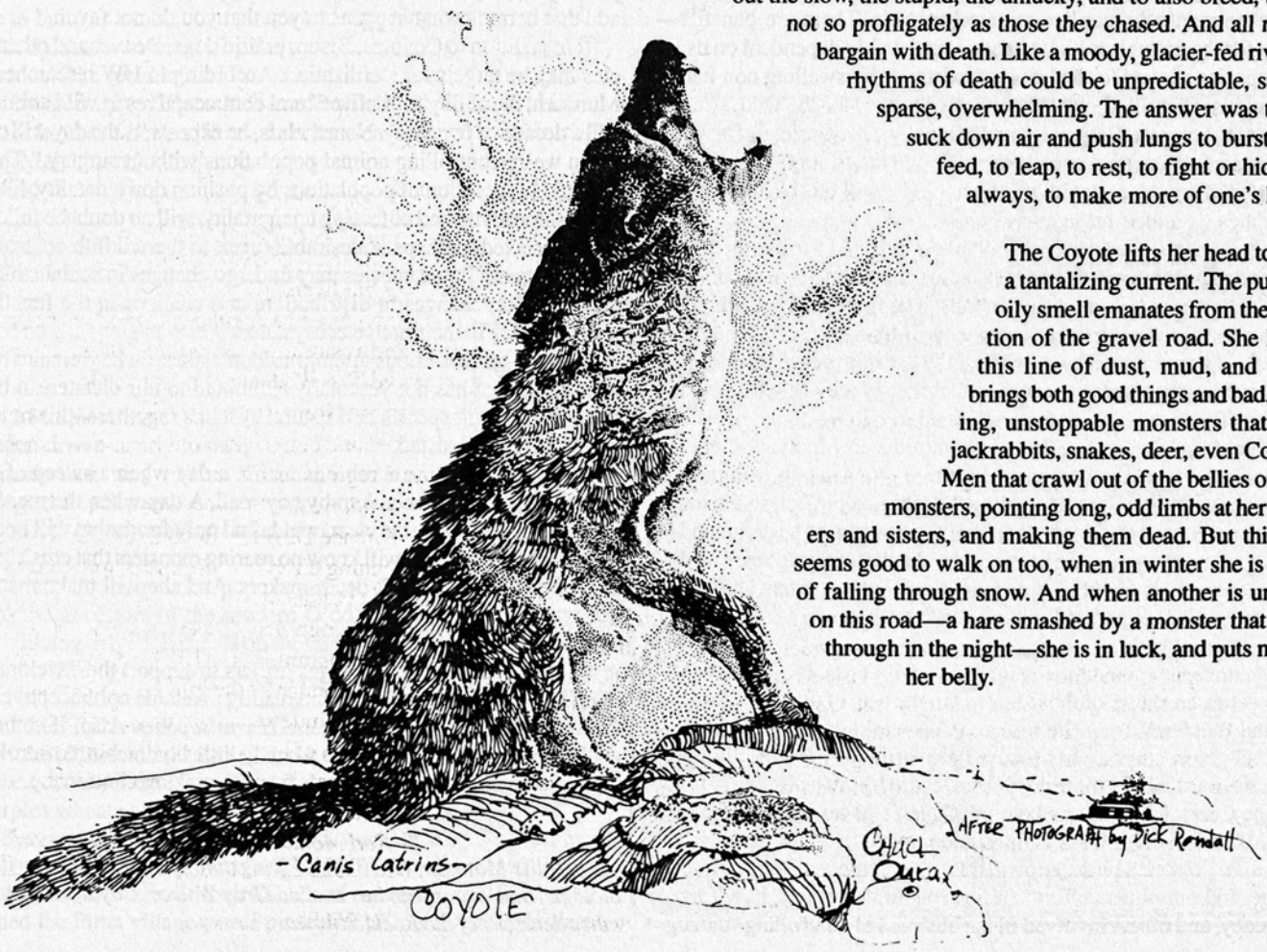


illustration by Chuck Ouray

We will have found yet one more way to kill the wild, and with this technology, will be able to kill even before there is a life to take away.

The odor draws her on. Her nose seems the only part of her eager for discovery. The rest hangs back, stretched out and low to the ground. When she reaches it, she stares. It is quiet and round, like a stone. But unlike a stone, it is glistening, rumply, white, and redolent of one languid fall afternoon, when she and her family feasted on a fat bull Elk, fallen in the trees, beyond the reach of a hunter who had aimed badly. She is cautious, clever, but young. She snatches the tallow ball, gulps it like she would a deer mouse, and glancing up and down the long scar of bare earth, sprints for the woods.

She lives. She will hunt more pocket gophers, take battered roadkills, converge on fawns with the aid of another meadow-dancer/vole-seeker whom she encounters, and with whom she stays. But that day, without her knowledge or consent, her pact was broken. She will not make more of her kind.

This is a scenario we may anticipate if researchers at the University of Wyoming are successful in a new enterprise: developing a vaccine to permanently sterilize targeted animals. There are benefits—mostly for the animals we have made irretrievably dependent on us, or those species shoved to the brink of existence by swelling non-native populations. Overall, though, I see a dark future, for the wild, stretching out of a dark past. Barren, instead of bloody; silent instead of screaming. But dark and wrong, nonetheless. We will have found yet one more way to kill the wild, and with this technology, will be able to kill even before there is a life to take away.

At present, the vaccine is available in injected form only. It will take time to develop an active oral vaccine and testing is now confined to domestic sheep, lab mice and rabbits. The immediate goal is to be able to control the reproductive capacity of livestock, pets, and other captive and domestic animals, without the use of expensive and sometimes brutal surgery (castration). The technology may help to solve the problem of wild (but non-native) horses on fragile Western rangelands, exotic goats on Santa Cruz Island, or introduced Mountain Goats in the Olympic Mountains. An animal welfare group, along with the US Department of Agriculture is funding the research project, so the interest in more humane treatment of animals is clear and to be commended where it extends to domestic animals and troublesome exotics. The difficulty comes when the misguided, the fearful, the arrogant and domineering lose sight of proper limits and attempt to sweep a net of control over the whole world.

Most research on animals, including wild ones, is aimed at a select few: those we use, or those that get in the way of our use; those we love and those we hate. The research and work directed toward animals that get in our way has focused primarily on ways to kill more. But death, particularly the kind brought about by agencies like Animal Damage Control (ADC) can be ugly. Coyotes, skinned and piled in a heap. Mountain Lion, foot clamped and mangled, left to scorch in the desert sun. Poisoned birds. Drowned Beaver. Stiffened Bobcat. Public outrage, and subsequent effort to reform or eliminate ADC have forced the agency, and others involved in the business of controlling "damaging" animals, to rethink the emphasis on mortality. Unfortunately, the change seems to go only so far as finding other, less blatantly hideous, means of control.

They still don't get it. Unfortunately, the public may not get it either, once the killing slows and a quieter campaign begins. UW researcher Ray Field demonstrates this inability to truly perceive the issue: "It would not do any animal any harm," he says of the vaccine. He refers specifically to non-target species that may ingest a dose of Coyote contraceptive, but his wording suggests that not even the target species is being harmed. Perhaps he really believes this, but would he, and others involved with management of wildlife populations, find it acceptable if contraceptives were scattered widely for valuable game species—Elk, trout, Bighorn Sheep—to consume. What he really means, what state fish and game departments mean when they berate anti-hunters for "worrying about individuals," what ADC officials mean when their rejoinder is "Well, we aren't going to make _____ (fill in the blank) extinct," is this: Harm is being done only when populations are not increasing or decreasing the way we would like, and when they are not the size we deem acceptable. There is no harm when Coyote numbers are shrinking. There is no harm when multitudes of deer and Elk are blasted in an autumn orgy of killing, the biggest and the strongest hauled away in the beds of pick-ups. "Objectivity is what does not happen to you," says feminist author and activist Andrea Dworkin. I would add that harm is what happens to you that you do not favor.

In addition to Coyotes, Bison, prairie dogs, Beaver and other species may be targets for sterilization. According to UW researcher Bill Murdoch, the ability to "deliver" oral contraceptives to wild animals is still a decade or two away. Nonetheless, he expects "...the day will come when we're controlling animal populations without surgery." The attempted suppression of populations by pushing down natality, like the old-fashioned method of forcing up mortality, will no doubt be followed by unexpected, perhaps undesirable (even to the wildlife controllers) consequences. Target species may undergo changes in social structure and behavior, changes in distribution, and changes in the functional role they play in their native ecosystems.

This latest, insidious attempt to domesticate what remains wild, to control what has not yet totally submitted to our dictates, to break the pacts binding species and natural systems together—this must be recognized and resisted.

We must imagine another scenario, a day when a sweep of glistening grass will be unbroken by any road. A day when the meadow-dancer will scent only the clean wind, find only foods that will nourish and strengthen her. She will know no roaring monsters that crush brothers and sisters, that vomit death-makers. And she will make many of her own kind.

Postscript: The author urges readers to support the development of effective, safe, inexpensive and readily available contraceptives for the species that really needs them: *Homo sapiens*. Also, if someone could figure out how to produce a handy little bovine birth control pill, to be scattered discreetly on one's favorite grazing allotment...

Mollie Matteson (POB 273, Livingston, MT 59047) is a wildlife biologist and writer who has studied Gray Wolves, Coyotes, trout, and other denizens of the Rockies.

Arizona, The Floating Desert

by Gregory McNamee

There were times in January and February 1993 when I could swear I saw the neighborhood animals lining up two by two.

The winter floods came as no surprise to long-time Arizonans. The desert, they know, has its cycles: some years it rains a lot, some years barely at all. The prevailing El Niño weather system has brought the state plentiful rain in the last few years, with wet winters and comparatively dry summers, the supposed "monsoon season." And for the second time in a decade, most of Arizona's rivers surged to so-called hundred-year-flood levels, which, as the name implies, should occur but once a century. The Verde River did even better, cresting to the thousand-year mark.

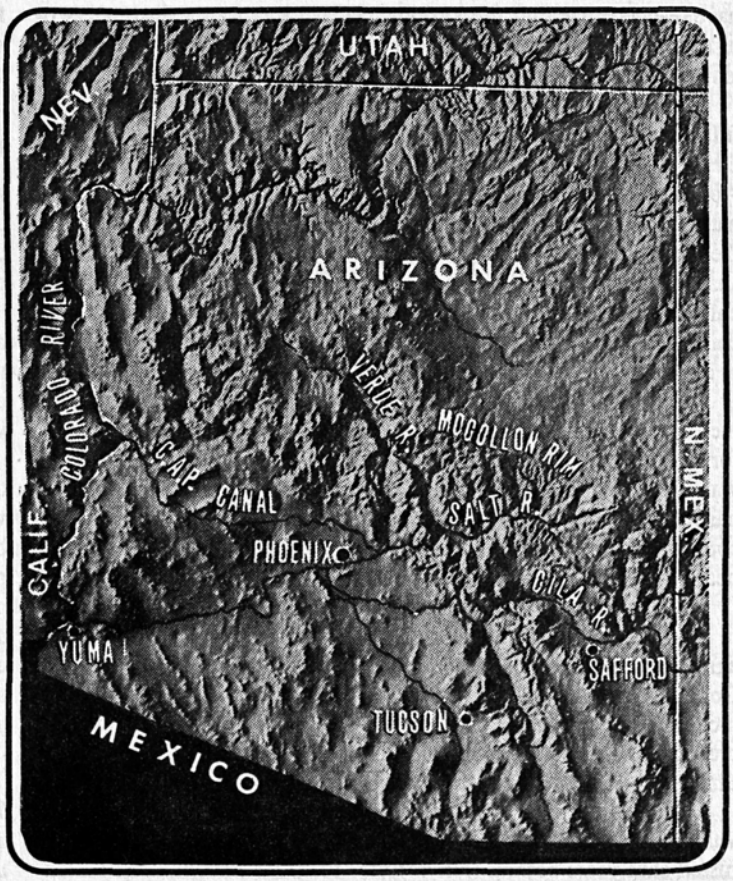
The floods had their surprises nonetheless. The developers who chose to build apartment complexes and shopping centers on obvious floodplains wondered why their properties had gone sailing off to Mexico. The residents of Winkelman Flats seemed to be taken aback by the raging Gila, which made off with their horse trailers and toolsheds and homes. Yuma farmers were stunned by their waterlogged fields and damaged crops.

And the engineers who continue to channelize and dam Arizona's streams and rivers, hoping to tame them, wondered why nature refused to submit to our collective will.

The first Anglos to arrive in what is now Arizona had less lofty ambitions. They found its rivers to be a natural treasure trove that needed no change. For one, the watercourses were full of Beavers—one of their largest dams, accommodating thousands of individuals, stood near the modern I-10 crossing over the Gila. Beaver pelts fetched $6 apiece in the 1830s, and within a decade the population had been driven nearly to extinction. (No matter; the Beaver trappers made their way westward to California and signed on to the whaling trade.) For another, the rivers watered great stands of timber, nurtured lush expanses of bottomland that were ideal for agriculture just as they were.

Arizona's indigenous population had long known this. The Hohokam, ancestors of the modern O'odham (Pima and Papago), were building irrigation canals on the Gila and Salt Rivers at the time of Christ. They grew beans, peppers, melons, and maize for more than a thousand years, until the mineral-rich river water eventually coated their fields with an impermeable layer of salt. Their descendants farmed more modestly, but the rivers yielded enough crops that the Pima could sell the United States government five million pounds of surplus wheat at the close of the Civil War.

Seven years later, these same Pima were starving. Anglo farmers at two new towns upriver, Safford and Florence, had built dams and diverted the river onto their fields, and now only a trickle of water reached the Pima villages, near present-day Laveen and Avondale.



map by Brian Evans

The time has come not to build more dams but to dismantle, one by one, those that choke our rivers.

A Pima delegation, led by Antonio Azul, traveled to Washington to petition President Ulysses Grant for the restoration of their water rights. Grant politely suggested they relocate to the Indian Territory, now the state of Oklahoma.

For the first time water became a commodity in the desert, subject to buying and selling. Anglo farmers rushed in to claim whatever riverside fields they could find; Anglo miners diverted torrents of water to blast hillsides with hoses and release hidden copper, gold, and silver; Anglo ranchers brought in great herds of thirsty cattle from Texas, more than three million head by 1890.

Arizona, it soon became apparent, lacked sufficient water to supply these various needs. The point was driven home in 1892, the onset of a decade-long drought. No new grasses sprang forth out of the already denuded ground, and unacclimated English breeds like Devons and Alderneys quickly died of thirst. A year later the hardier Texan and Mexican breeds joined them, and, as one rancher recalled, a person could "actually throw a rock from one carcass to another" across the entire territory. Hydraulic mining operations shut down, crops withered, and ghost towns sprang up throughout Arizona.

Rather than cut back, the economic interests turned to the federal government and demanded that the nation subdue inhospitable nature. Businessman A. J. Chandler, for whom the city is named, found a sympathetic listener in Theodore Roosevelt, who authorized the National Reclamation Act of 1902, sending millions of dollars westward for water projects. These involved the creation of huge bureaucracies like the Bureau of Reclamation and the Bureau of Land Management, which have reached pharaonic proportions. Wallace Stegner, the distinguished historian and novelist, even traced the beginnings of modern state socialism to the federal government's treatment of Western lands and waters.

One of the first results of the act, named Roosevelt Dam by grateful Arizonans, impounded the Salt in 1912. Two decades later Coolidge Dam rose on the Gila, drowning the most fertile land on the San Carlos Apache Reservation and bringing famine once more to that unfortunate people. By the 1960s eleven major dams controlled the runoff from the Mogollon Rim, and five more milked off Arizona's legally-ordained share of the Colorado. The bounty made it possible for Arizona's agricultural interests to grow wetland crops like alfalfa, asparagus, citrus, cotton, and hay, and for the livestock industry to continue to graze cattle in increasingly destructive numbers.

It made Arizona an urban state as well. To this day, thanks to direct and indirect federal subsidies, New Yorkers pay four times more for their water than do Phoenicians—whose per capita consumption of water is the highest in the nation. Now that the Central Arizona Project has wound its way to Tucson, residents of that city have no incentive to conserve the precious liquid, as they had been doing relatively well for nearly two decades.

But dams cannot permanently thwart nature. An early lesson came in 1904, when the Gila flooded with an early melt of snow, destroying agricultural check dams along its course. The discharge spilled into the Colorado, driving before it a huge uprooted oak tree that broke through a control gate just above Yuma. Part of the river poured through the breach and flowed westward, eventually filling the bone-dry Salton Sink—now California's Salton Sea.

When the rains of October 1983 came, the dams again proved vulnerable. The floodgates at Coolidge Dam failed to open, having rusted shut years before. (No operator seems to have noticed.) Glen Canyon Dam, on the Colorado, shivered in its soft sandstone bedding, and its operators sounded a warning that it might collapse at any minute. It would have taken with it, in turn, Hoover Dam, Davis Dam, Parker Dam, and Imperial Dam. Against all odds, it stood, but dozens of earthen check dams crumbled across the state, and floodwaters wreaked havoc from Nogales to Colorado City, from Clifton to Quartzsite.

January 1993 brought worse news. By the 11th the Gila was flowing at 30,000 cubic feet per second, twenty times its normal load; Coolidge Dam again failed to do its putative job, and it released a dozen times more water than it did in 1983. That was no surprise: in 1990 the federal Government Accounting Office deemed it the most dangerous dam in the country, the one most likely to collapse without warning. For two weeks, the residents of Winkelman and other Copper Basin towns got more than a little taste of what that collapse will involve.

In other parts of the state, buckled roadways and shorn bridges, dismantled apartments and mangled automobiles, silt-covered floors and shattered lives formed the legacy of two weeks of rain. They stand as reminders of nature's incalculable powers.

But humans tend toward historical amnesia, for all the reminders in their paths. There are still those who press for the construction of more dams on Southwestern rivers in the vain hope that, yes, this time, the world will conform to our desires. One of these projected dams, Hooker, would flood six miles of the Gila Wilderness of south-central New Mexico and destroy two important bird sanctuaries.

To Southwesterners the real lesson of winter should be this: the job of rivers is to flow. Every obstacle that we place in the way of their free movement carries staggering costs. Each dam prevents water-borne nutrients from replenishing the soil along a river's course; each destroys native fish and other wildlife populations; each alters native riparian environments and encourages the invasion of nonnative plants like the tamarisk tree.

It is also the job of rivers, on occasion, to flood. Recognizing this simple truth, we can save ourselves heartache by not building our homes and hospitals and shopping malls in places that inevitably will lie under water every now and again. We can also acknowledge that patches of the planet are not ours to control.

At the close of the war with Mexico, the jurist Daniel Webster asked his colleagues in Congress, "What do we want with this vast worthless area—this region of savages and wild beasts, of shifting sands and whirlwinds of dust, of cactus and prairie dogs? To what use could we ever hope to put those great deserts and endless mountain ranges?"

In the last century, we have put this supposed howling wasteland to more uses than it can reasonably sustain. But time is a wheel, and we can reverse our course if we so choose. The time has come not to build more dams but to dismantle, one by one, those that choke our rivers. We'll have to make do without a few things in the process: the green lawns we've brought from points east, golf courses that consume a million gallons of water a day, inexpensive winter vegetables and cheap, abundant beef. And we'll have to accept the notion that floods are a part of this place's reality.

It's an entirely immodest proposal whose time has surely come.

Gregory McNamee (1128 E. 10th Street, Tucson, AZ 85719), a Tucson-based writer, is the editor of Named in Stone and Sky: An Arizona Anthology *(University of Arizona Press). He is also the author of a forthcoming history of the Gila River.*

Letters

INTERNATIONAL RUSTIC HQTRS

By the time Bill & Hillary waddled up to that Presidential boudoir, me and Rip Crenshaw was knee deep in another wild fracas at the Fuzzy Mule with a gaggle of borned-again-dyed-in-the-woods red necks over whether the Most Right Reverend Billy Graham's side burns are on loan from Neil Young or merely a greazy slight of hand for purposes of lookin sexy on tee vee. We had to make a fast git-away when Rip screamed at the top of his lungs: "Satan lives at K-Mart!"

What is it with people? Ya know you're in trouble when 99% of y'all don't recognize that there's too many of us folks. Only so many grits to go round, as we say down here in the Heart of Dixie.

For instance: lemme tell y'all a little story that really happened.

There's this here river that meanders round Alabama like a water moccasin in heat. Startin up near this honky village named Trussville, it dithers awhile then beelines straight for the heart land. On the way, it cuts through a bunch-a geologic zones (what kinda logic is that?) and gits what some folks refer to as "biologically diverse" in the process. (More fuzzy logic.)

Down beneath them cool waters is a mess of weird fish and critters of all kinds. Nobudy much pays heed to that sorta stuff no more. Says the City Council: what is good about a nearly vanished mussel? Then again, seen much use for y'alls City Council lately?

This here river's got them silly looking longnosed paddlefish, and a lily pretty enough to frame, and somethin called the Alabama sturgeon what could be from one of them Hollywood movies about the dinosaur age.

But seems like the whole world wants that river. Must be 15 of them dee-velopers wantin to put up condos and auto parts stores on its banks. And, for ya know it, Taco Bells will be ringin round the clock over the shores. And the County Commission wants to run a tunnel under the river so's they can have another 10 million gallons of poop runnin downstream. Aint that a pisser?

Well, as y'all can spose, things is gittin hot and heavy round here between us rustic types and them Progress fellers. There's been a coupla dozen high powered meetins in the Capitol. And them reporters git all excited when anything happens involvin that river. Must be money enough for everybody where that there water's involved.

I think somebody is gonna pass some laws bout pollutin the river pretty soon. Heard from Thelma Lou that the guvment is lookin to put some of them fishes on the Endangered Critters list. Lotta good that'll do. Fish caint live on paper.

Been a few lite weight protests concernin the river. Nothing special. Hasn't been a decent protest round here since Martin King's friends out trampled the Birmingham police department in the ground. Old Bull Conners shore looked silly on the tee vee with them fire hoses, didn't he. Remember his funny hat?

Anyways, this here is leadin up to somethin havin to do with me and Rip's narrow escape after our gala soiree at the Fuzzy Mule with them Bubbas.

See, it's like this. Life's too simple for guvments.

Soon as a guvment gits involved, things start lookin shaky, know what I mean? First, there's discussions. Soon enough, there's more discussions. Oh yeah, don't forgit them scientific studies what have to be done. Then another round of discussions. Meanwhile, them envirmentals sit at the table wishin they was really in power so they could be eatin lunch with Hillary up in Washington.

Pretty soon, after the News has had its run at things, well...it usually starts lookin messed up. Maybe its just a screwy focus that gits put on things. I don't know.

But the bottom line, and I aint talkin trash neither, is this here: Take all them studies, all that mumbo jumbo, the envirnmentals at the table, the News, the tee vee, the blue prints and whacky computer models—just chuck em. They aint worth a dime.

Nope. It's just too simple for guvment. See, all ya gotta do is figure how many folks the river can bear. Then cut in a safety net number. Then factor in who wants to do what. Then tell em: sorry, but only x number of y'all are living or working in this zone and ya caint screw it up at all, that's the end of it.

Yup. I reckon I'm gettin into strickt biology here. Allowin Mama Earth to set the tone. Not some ingineer from one of Alabama's third rate A&M university schools.

Aint it amazin how easy savin a river is? Just do y'alls home work in the first place. Ask the woods how many folks she can stand. The waters'll tell ya. The grass aint mute neither. Gotta git that noggin in tune, sing to the stars, sip a little Kentucky brew b'side a roarin fire as them cicadas boogie to that timeless beat.

One time I told that County man... the one wants to tunnel the river... bout my method. He cocked his ugly shorn head, sayin in a nasty tone: "That's anti-Progress! You'd put us back in the dark ages!"

Couldn't help but snicker. "Son," I said. "My mama got her one of them fancy washer dryer combos few year back. Real modern. One nite that dryer was just a'chuggin when it broke loose from its moorings. That thang started jugglin round the kitchen, causing a ruckus like ya never

STATEMENT OF PURPOSE

Wild Earth is a non-profit periodical serving the biocentric 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 working with The Wildlands Project to complete, and subsequently publish in book form, a comprehensive proposal for a North American Wilderness Recovery Strategy.

Erratum

The telephone number for **Northwoods Wilderness Recovery** published in the spring issue of *Wild Earth* was incorrect. The correct number is (906) 482-4364.

heard—finally ran over the cat... killed him dead as a bush-hogged toad. Mama turned to hangin the clothes out on the line like in the good ole days. Some progress..."

The moral of this here story is—that river, and y'alls river, too, can flow free as a bald eagle under one condition. More wilderness, less people!

—Pete Jones, Birmingham, AL

note: Pete Jones is titular head of the Alabama Rustic Society, a sometimes band of quasi-serious crusaders who plan to return Alabama to its natural state by the year 2050. Their motto is: Multiply trees, not people! Pete, who speaks and plays the banjo at local birthdays, bar mitzvah and pagan celebrations, is often quoted as saying: "Time to backwash the gene pool, y'all!"

SOULÉ ANSWERS HIRT AND DEBINSKI

The general point that I tried to make in my essay was that we should abandon our crisis mode of response to land use in North America in favor of a long-term, strategic approach to wilderness recovery because the latter allows options that would not even be considered during the heat of a crisis. I attempted to illustrate this with a hypothetical example of a trade-off, arguing that it may be necessary to give up a little in order to gain a lot—in this case giving up a little "old growth" now to secure a critical corridor for black bears that would eventually increase the bears' geographic range and long-term viability in the Appalachians. I am sorry that this was interpreted by Hirt and Debinski to mean that I was not in favor of preserving what little remains of ancient forests in the US. I don't equate old growth with ancient forests.

In retrospect, though, it may not have been prudent of me to flaunt my pragmatism. In defense, I could state the heresy that not all "old growth" is equally or infinitely precious. If I had selected "old growth scrub oak in California" or "old growth aspen in Colorado," I wonder if the outrage would have been the same? Nevertheless, I meant what I said; I am not retracting it.

It's not that I'm unsympathetic with those who stake out uncompromising positions. We must draw the line somewhere, and under ordinary circumstances the destruction of ancient forests, any of them, is unjustifiable. But I've never had much truck with absolutist views, and if forced to, I could dream up many scenarios where I could tolerate the felling of, say, one old tree, as long as I was convinced that the sacrifice would bring a significant advance for biodiversity and wildness in general. But if one tree is negotiable, why not a dozen? Where does one draw the line?

That is always the question. C.P. Snow once wrote that once you get on the moral escalator, it's hard to get off. That, in a nutshell, is the problem with situational ethics. Still, I prefer the dilemmas of relativism to the coziness of absolutism. The former may expose one to the label of compromiser, but the latter often lead to polarization, stalemate or worse.

—Michael E. Soulé, Santa Cruz, CA

MORE ON ZOOS

I am writing in response to the article by Mary Byrd Davis in the Spring, 1993 issue of *Wild Earth* titled "Do zoos compete with habitat?" The author's conclusion, i.e., that zoos and conservation organizations are competing with one another for funds, is based on two highly erroneous assumptions: (1) that, should zoos and aquariums be closed, their funds would be immediately transferable to habitat preservation, and (2) that zoos and aquariums are not conservation organizations.

The contention that money spent on zoos and aquariums is depleting support for habitat preservation is not a new one. The implication is that, should zoos and aquariums disappear tomorrow, all the funds currently being invested in them would be transferred to habitat protection. This is clearly not the case. In fact, most North American zoos and aquariums are supported largely by city or state governments, and it is naive to think that their budgets would suddenly be available for use by other conservation organizations. It is far more likely that such funds would go to repair bridges or roads, and thus not be available to conservation at all.

The author's second assumption is that zoos and aquariums are not conservation organizations. This is also patently false. In fact, the American Association of Zoological Parks and Aquariums (AAZPA), which represents 161 of North America's finest zoological facilities, has identified wildlife conservation as its highest priority.

The investment of modern, professionally-managed zoos and aquariums in wildlife conservation and science is growing exponentially. In 1990-91 alone, AAZPA and its member institutions initiated or supported nearly 790 conservation and scientific projects in over 60 countries worldwide. In the past two years, over 800 publications were produced by zoo scientists and their collaborators on wildlife biology and conservation.

AAZPA recently formed an In Situ Conservation Committee to begin to facilitate the involvement of its members in field conservation efforts. Several institutions have been extremely active in this regard, including the Chicago Zoological Park, Minnesota Zoological Garden, National Zoological Park and San Diego Zoo. For example, the Minnesota Zoo recently "adopted" Ujung Kulon National Park on the island of Java in Indonesia. The Park is home to the Javan rhino, one of the most endangered large mammals on earth. Less than 60 of these animals survive on Java, all in Ujung Kulon. The zoo has provided direct support for park management, including construction of a patrol boat, aptly named the "Minnesota." NYZS-The Wildlife Conservation Society, which administers five zoos and aquariums in the New York area, spent over $7 million in 1992 on its field conservation arm, Wildlife Conservation International. More recently, the AAZPA announced a Giant Panda Conservation Action Plan, wherein a consortium of zoos will provide direct support for the conservation of giant pandas in China.

AAZPA institutions also educate millions of zoo and aquarium visitors annually about wildlife and wildlife conservation issues. Over 105 million people visit AAZPA-accredited institutions annually. In 1989 alone, nearly 9 million school children received some form of formal instruction at AAZPA institutions. AAZPA members work closely with other conservation organizations on public education projects. For example, World Wildlife Fund, the AAZPA and the US Fish and Wildlife Service are cooperating on a program known as "Suitcase for Survival." Thousands of school children and young adults are being taught about the devastating effects of the wildlife trade by being shown examples of confiscated products made from animals.

AAZPA is a member of The World Conservation Union (IUCN)—the largest collection of governmental and non-governmental conservation organizations and agencies in the world. Many zoo professionals serve on or chair the IUCN Species Survival Commission's and Interna-

tional Council of Bird Preservation's (ICBP's) taxonomic specialist groups. Such Committees provide an important and influential network for worldwide efforts to preserve endangered species.

AAZPA institutions also participate in cooperative breeding programs for endangered species. The Association does not suggest that captive breeding is a panacea for the endangered species problem. However, it does believe that carefully managed captive breeding and reintroduction programs may be the only hope for many critically endangered species. AAZPA now administers cooperative, scientifically-managed captive breeding programs (i.e., Species Survival Plans or SSPs) for 68 different endangered species, including the California condor, black-footed ferret, golden lion tamarin, Arabian oryx, Puerto Rican crested toad, and Asian wild horse. Many of these programs involve not only captive breeding, but also field conservation and public education efforts in the species' countries of origin. In many cases, AAZPA and its member institutions work directly with government wildlife authorities, and ownership of the animals often remains with the country of origin (e.g., golden lion tamarins in Brazil).

In summary, the author's primary assumptions are patently erroneous, and her conclusions must therefore also be questioned. Her suggestion that "imaginative conservationists should be able to steer at least some of the money now going to zoos and aquaria toward habitat protection" is unlikely, since zoos and aquariums are rapidly moving in this direction themselves. In fact, I would suggest that modern, professionally-managed zoos and aquariums are the "sleeping giant" of the conservation movement and the giant is awakening. They are unique among conservation organizations in having a direct connection with the public, and their growing expertise in science, conservation, public relations, exhibition, public education, and fund-raising, could eventually make them one of the world's most powerful and effective conservation vehicles. Sincerely,

—Michael Hutchins, Ph.D., Director, Conservation and Science, AAZPA, 7970-D Old Georgetown Road, Bethesda, MD 20814-2493

Author Responds

If zoos are the "sleeping giant" of the conservation movement, I hope they will wake up soon. We have only seven more years to go in this decade that will, we are often told, determine the fate of the earth.

Nevertheless, zoos are not in my opinion the most essential means of public education. The international programs that Dr. Hutchins describes are of inestimable value, but the sine qua non for the survival of habitat, wildlife, and people is simplification of lifestyles in the developed world. Zoos are too much a part of the realm of high technology and market economics to convey this basic message effectively.

Zoos are not "unique among conservation organizations in having a direct connection with the public." The conservation movement includes not only large, possibly impersonal, organizations, but countless grassroots groups and individuals who speak to and set an example for their neighbors.

Is it naive to think that a city or state might help finance the efforts of such people? Not altogether. By chance the other day I met a woman from rural Kentucky who heals wounded raptors. She recently began offering to schools an environmental program in which she shows a permanently disabled bird. To her surprise and relief she found that schools are glad to pay a fee for the programs. Public money to home-based environmental work.

I agree with Dr. Hutchins that reducing funding to zoos would not automatically increase funding to habitat protection or other conservation work. I did not intend to give that impression. Even so, money spent on one program is not available for another.

—Mary Byrd Davis, Ph.D.

MUDD ON ZOOS

Enjoyed mary Davis's article in last issue on zoos ["Do Zoos Compete with Habitat?"]. A tad on the number crunching side, but good data nonetheless.

Having served on the Board of Directors of a major urban zoo (Alabama Zoological Society, Birmingham, AL), I have these observations about my experience therein:

1. Zoo animals on exhibit are little more than socio-political prisoners.

2. The public at large would be shocked at the post-business-day, after-exhibit conditions of many of their favorite zoo specimens. Imagine a Grizzly Bear in a 15x12 holding cage. Now visualize a free ranging Griz in the wild.

3. Zoos tend to enthrall children and are often set up for that purpose, parents being necessary appendages of their offspring (with the entrance fee). Kids have no idea of whether zoo exhibits are truly a meaningful experience. Their caged counterparts are rarely asked.

4. Zoos are indeed expensive; they compete for donations, city handouts, political favors, public approval, etc.

5. As with most business ventures, profits and stale ideas often rule the day. At the zoo's inhabitants expense.

6. Zoos offer little in the way of true conservation ethos, much less preservation. Often relying on museum-like graphic packages (at great expense!), many zoos expect visitors to gather insight into the demise of the natural world by reading signage. Sorry folks: zoo visitors, for the most part, don't go there to engage in heavy reading. The real message—wild habitats around the globe are succumbing to human population pressures—goes unheralded.

7. Children can learn more in half an hour by watching conservation oriented television (egads! not tee vee?!) than they do by wandering aimlessly around a zoo munching cotton candy and giggling at neurotic primate behavior. (I cite scat flinging. Any zoo visitor has surely witnessed their favorite chimpanzees hurling feces at human passers-by. Perhaps a neurotic response to being caged, stared at, laughed at, insulted, etc. Still, a quite poetic response.)

8. The so-called "natural habitat" trend at American zoos is a well meaning scam. During my tenure as Board member of the Zoological Society, my definition of "natural habitat" was quickly denounced as "impractical." My detractors meant "expensive," to be sure. Here is my definition:

A zoo habitat is "natural" if ALL of the inhabitants of the exhibit have no notion that they are in captivity. Ever. No holding cages, no glass walls full of staring human faces, no ambient human sounds outside the exhibit. I recommended that the Birmingham Zoo convert to insects, maybe small amphibians.

9. Most zoos are operating beyond their capacity to insure the happiness of their charge.

10. Modern, high-tech, simulated exhibitry notwithstanding, zoos do not approximate the wild. They may be doing more harm than good, at least in terms of their educational value. If zoo visitors come away thinking it is "ok" to house Earth's wild denizens in captive situations, said zoo has performed a disservice to the wild. Period.

So I'm no zoo fan. As astute readers of *Wild Earth* may recall, I harbor a longstanding fantasy which involves liberating the Birmingham Zoo's captive Red Wolves. After conditioning them to despise Homo erectus asphaltus, they would then find freedom in the last wild haven of Alabama —the Sipsey Wilderness.

Not that I'm openly advocating trespass and grand larceny, mind you. Heavens no! I'm a member in (reasonably) good standing of the Alabama Bar Association (that's lawyers, for you alcohol oriented readers).

But I seriously question whether the Red Wolf, as a (sub?)species, is really benefiting from the zoo's captive breeding program. As I've stated before in these pages, without the requisite wild habitat in which to survive unfettered by humans, Red Wolf is headed for certain extinction as a wild species. In fact, even roaming within such lush habitat as North Carolina's Alligator National Wildlife Refuge, Red Wolf is still relegated to zoo-like status. Complete with belly-implanted radio devices.

Do zoos compete with habitat? Probably, to some extent. However, remember, zoos tend to be supported by well-meaning, (sub)urban do-gooders and their counterparts within the philanthropic foundation hierarchy. They see zoos as friendly places where other urban folks can spend an afternoon of relative safety (compared to the zoo out on the streets), wandering amongst the sculpted concrete exhibits, marvelling at the "natural" world. Ditto for aquaria.

Thus, it follows that these same dollars would not necessarily be channeled into the wild if zoos suddenly vanished. Rather, I suspect those resources would quickly migrate to more benign refuges such as symphony orchestras, museums, the arts, etc. Humanities, in other words.

In the final analysis, Mary Davis is correct in her assessment that zoos might be a drain on the "real work" of conservation.

Here's my idea of the 21st Century Zoo:

We come to the end of a dusty road (in our electric car for all you purists). There is a small parking area (not many cars here due to a drastic voluntary reduction in the human population). We exit our vehicle and approach a long trail which winds off in the distance. A funky wooden sign stands before us, a sentinel of wisdom and insight. It says: "Wild Rockies Exhibit. Sixteen (16) million acres (topo available). Bring out what you take in, if you come out. Wild conditions within. Carnivores present. Enter at your own risk! No rescue available. Respect the wild or face criminal charges. Thank you."

We don appropriate clothing, put on extra sunscreen (ozone hole now larger than remnant Europe) and walk slowly into the Montana Zoo.

—Ned Mudd

note: Ned Mudd is a correspondent for Wild Earth, *staff attorney for the Biodiversity Legal Foundation and currently lives in the Greater Metro Birmingham Human Zoo .*

WHITHER THE DOCTOR?

Having an interest in toxic reduction issues, I have followed the exploits of Dr. Dioxin in the pages of *Wild Earth*. I noticed he was silent in the last issue. What gives? Doesn't he live up to the editorial standards of *Wild Earth*?

—Louis E. Stewart, Durango, CO

***WE* response:** Several folks have inquired as to Dr. Dioxin's whereabouts since his last piece (Winter 1992/93 Issue). According to his diligent secretary and confident, Patty Sue, the near-legendary Doctor is missing in action. Scheduled to appear (incognito) at a conference of EPA workers in DC on May 14, he never showed.

Several theories as to his disappearance are circulating, some quite marvelous. One has the Doctor kidnapped by a gang of disgruntled pulp mill workers. Not likely, since our wily writer travels heavily armed and must be considered dangerous (to humans).

One pundit posits the Doctor being detained for questioning by agents of one or more branches of government. Like the first theory, this is untenable, as the good Doctor is known for his sixth sense regarding proximity to bureaucrats of any persuasion. He intuitively avoids federal agents like the plague.

We conclude that the intrepid toxic traveler is simply taking a well deserved interlude in his caseless quest to expose the ravages of dioxin on America's aquatic ecosystems. Smart bets are on him doing what he does best: holding up in a cold, dark, motel room, a glass of Jack Daniels in one hand and a remote control in the other. When we hear from him, so, too, will you.

DEAR FRIENDS AND FELLOW POETS:

As co-editor of poetry for *Wild Earth* magazine (with Art Goodtimes) I see a lot of poems speaking out for the wild earth, but the magazine simply doesn't have the space for much poetry. I would like to edit and publish an anthology of "poems for the wild earth." I am writing to solicit your participation in a number of ways.

I want to create an anthology of contemporary poetry giving voice to particular places, particular species, particular cultures. I want the bioregional voice; the voice of the forest, desert, ocean; the voice of the wind, the wolf, the fern. I want the voices of humans living deep within communities and cultures. I don't want rant disguised as poetry; I want to hear the voices of the wild earth speaking through the poet's work. I want this to be a book not only carried in backpacks but read from at public hearings and gatherings. I want it to be an active anthology, to be of use. I am looking for old and new work. Please include information on reprint rights if I need to obtain them. If you want the poems also to be considered for *Wild Earth* magazine, please note that.

I want the anthology to represent as wide a range of cultures and regions as possible. Please help find poets on other continents. If you have suggestions of individual writers, groups or publications, I would appreciate addresses, and copies of poems. I would like to feel that we are all involved in the editing of this anthology. I do hope to hear from you.

—Gary Lawless, RR 1 Box 228, Nobleboro, ME 04555

DEAR WILD EARTH:

Many thanks for your recent issue on The Wildlands Project. Dr. Noss's land conservation strategy article was very helpful to me in my Masters Thesis work. This project is utilizing data on the Adirondack's Boquet River drainage basin to help develop a method for habitat protection planning which harnesses the analytical, cartographic modeling capabilities of Geographic Information Systems (GIS).

As someone working on a land conservation strategy for a portion of the Adirondacks and having spent a considerable amount of time researching the history of private land use planning in the Adirondacks, I feel the need to respond to Paul Medeiros's "Proposal for an Adirondack Primeval." Before I respond, however, I should identify myself as a non-Adirondacker dedicated to

the Biocentric vision of a world in which humans are intimately connected with the natural world, living respectfully and sustainably with Wild Nature.

I share Paul Medeiros's longing to hear "the scream of the puma and the bark of the harbor seal...." I, too, long to see the restoration of an Adirondack Primeval.

Despite these joint visions, I strongly part ways with Paul's proposal. My objections stem from our divergent views regarding the unique nature of the Adirondacks. As Paul points out, the 120,000 permanent and 200,000 seasonal residents living in this wilderness setting make the Adirondacks unlike most parks. Adding to its uniqueness is the sheer size of the Park. At 6 million acres—2 and a half times the size of Yellowstone National Park, larger than the entire state of Massachusetts, and 1/5 the land mass of New York State—the Adirondack Park is the largest park in the contiguous United States.

At a time when nature reserves are proving too small to even begin to protect viable populations of resident species (not to mention those which have been extirpated), new models for land protection are desperately needed to address the long term maintenance of biological diversity. Besides finding ways to reduce our overpopulated human societies, we must also begin to find sustainable ways to live within nature—not without.

As much as the residents of New York have given the world a gift of untold value in their protection of 43% of the Adirondacks under the landmark "forever wild" constitutional clause, they have indeed provided much more. For the last 25 years, the residents of New York have been engaged in a unique experiment in regional land use planning. In so doing, they have provided a new and revolutionary model for nature preserves—one in which human communities are inextricably linked. The importance of this experiment has been noted worldwide as planners from as close as the Pinelands of New Jersey and as far as Lake Baikal in Russia have looked upon the Adirondacks as a model of unparalleled opportunity. For as Paul Schneider states: "rather than a remnant of some lost Eden, the park is an ongoing experiment in creating a workable long-term arrangement between humans and their surroundings." (Paul Schneider, "The Adirondacks: The Remaking of a Wilderness," Audubon, June 1992, p.60.)

Paul Medeiros calls this uniqueness "not something to cherish, but something to despair." It is true that the Adirondacks are far from their original wilderness state. Progress particularly needs to be made in the areas of backcountry protection, strengthened shoreline development controls, controlling the cumulative effects of many small development decisions, and the reintroduction of extirpated species. Nonetheless, I strongly believe that the Adirondack model provides one of the few hopes for long term maintenance of biological diversity.

While problems with the reintroduction of Lynx indicate that reestablishing viable populations of extirpated, wide-ranging predators is still a dream, the solution surely does not lie in "the eventual reduction of the permanent human presence in most of the Park." In stark contrast, a realistic (yet visionary) proposal would follow Dr. Noss's model of nodes of high quality habitat, connected by corridors of ample quality and quantity, surrounded by broad buffer zones of outwardly increasing human activity.

Such a system, if restricted to the Adirondacks alone, would most likely not provide for the long-term survival of large, wide-ranging predators. O.H. Frankel, citing Soulé (1980), suggests that a short-term minimum viable population (MVP) for wolves would be about 600 individuals. Given the low population densities of wolves, the MVP would require an area 12,000 km2 (roughly one half of the Adirondack Park) (O.H. Frankel, "Genetic Diversity, Ecosystem Conservation and Evolutionary Responsibility." In Ecology in Practice Ed. F. DiCastri, et al. Dublin: Tycooly International Publishing Limited for UNESCO, Paris, 1982, pp. 418-420.) However, linking the Adirondack system with broad corridors to other regions including Tug Hill, the Green Mountains in Vermont, and the Catskills could eventually provide significant habitat for the long-term maintenance of populations of large carnivores. Such a model, if developed with both a firm understanding of conservation biology and a sensitivity to the history and politics of the Adirondack Park, would have the potential for realizing the true value of the Park. Such a model would provide the opportunity for a mutually harmonious relationship between humans and the natural world. Such a model might possibly, be our only realistic opportunity to preserve and enhance biological diversity.

—Michael Pressman, 59 Edgewood Ave., West Orange, NJ 07052.

THOUGHTS ON TWP SPECIAL ISSUE

Although *Wild Earth*'s special issue "The Wildlands Project" arrived a couple of weeks ago, I have only begun to study it carefully and have now read the first three articles and "Around the Campfire." All are excellent, very thoughtful, and recognize the practical difficulties in ultimately achieving the intended goals.

May I express a few preliminary thoughts, all supportive of the long-term objective. First, it strikes me that The Wildlands Project is indeed a major step toward leading the human race to regard itself as one more dependent element in the total processes of nature on this planet Earth—not as aliens and as subduers of all other life.

Second, the status of this project today reminds me of where we were in the 1930s when the modern wilderness preservation movement was getting underway. The objective as an organized citizen effort was new and Americans generally had to be educated and become accustomed to the idea. As a charter member of the Wilderness Society (founded in November 1935), I was there, and ever since active in the movement. The road is long and sometimes devious—just as you founders of The Wildlands Project clearly recognize it will be.

Third, let me suggest that wilderness areas designated under the Wilderness Act be viewed as stepping stones, as anchors, in building extensive chains of connected wildlands on the North American continent. In this light active support should continue to be given to designating new Wildernesses. To build the cause of The Wildlands Project, the support of the many Wilderness Act activists will be valuable. They should be shown that they have a place in the expansive goal of The Wildlands Project and be welcomed. The Project is a wise and evolving expansion of the simple wilderness preservation idea, the need made evident by changing times and conditions. While it is true that wilderness designation under the Wilderness Act has been bought by the public mainly on the basis of scenery and self-reliant outdoor recreation, wilderness advocates have long known that scientific study of nature and ecological preservation are its great values.

—Ernie Dickerman, Swoope, VA

UTAH'S BEARS AND LIONS UNDER SIEGE

Last August, Utah's Wildlife Board ended the spring bear hunt. After years of being ignored by the board's avid hunters, activists dared hope the state's beleaguered Black Bear population would survive after all. Then the backlash hit.

Black Bear and Cougar (Mountain Lions) have long been persecuted in the Beehive State. Utah ranchers began annihilating predators during Mormon pioneer days. Several decades ago, "sportsmen" joined the bloodbath, making no pretense at trying to preserve a huntable population.

No one has a reliable idea how many Black Bears and Mountain Lions are left in the state. The Division of Wildlife Resources (DWR) has two whimsical methods of estimating populations of these species. Their main count is extrapolated from the number of kills reported by hunters. Statistics kept over 20 years indicate that five times as many hunters now kill ten times as many lions each year. Ergo, lion numbers have gone up, they say.

DWR also measures certain game populations by asking hunters if numbers are rising or falling. More bears and lions mean more hunting permits, so naturally, hunters report seeing more animals every year.

For what it's worth, DWR estimates some 2000 Mountain Lions live in the state, along with 800 to 1000 bears. In 1991, hunters competed for 525 lion permits and 163 bear permits. Hunters reporting back to the agency killed 241 lions. ADC (Animal Damage Control) agents, road kills, and ranchers eliminated 56 more, for a total of 297. Only one illegal kill was recorded, a ludicrous figure considering the popularity of poaching in Utah. About 60 bears were reported killed in last year's hunting season. Thus the state is issuing annual permits for 20 to 25 percent of these animals, with almost 16 percent of lions and 8 percent of bears taken. DWR is confident that harvested animals will be replaced by reproduction. Lions must dodge hunters for two years to reproduce, while bear must survive four to five years to reach maturity.

Lions and bears are hunted in two ways. Baiting, the most common method of taking bears, involves planting a pile of garbage and entrails. The hunter climbs a nearby tree and kills an investigating bear with bullets or arrows. The spring bear hunt is the most destructive of all, since many of the victims are hungry mother bears emerging from dens with their cubs.

Bears and lions are also hunted with hounds. The target animal is set upon by a trained pack. The hounds chase the trophy-to-be until it's exhausted, usually up a tree. The hunter then kills the victim at his leisure. If the animal (and/or young) doesn't climb a tree, the dogs rip into it until their master arrives.

Hounding enthusiasts can also obtain 524 pursuit permits, which entitle the permittee to tree but not kill a bear or lion. The baying of hounds has become a familiar sound in rural Utah. Even if spared, harassed bears and lions may lose so much of their energy reserves that they don't survive.

During last year's season, hunters and pursuers reported treeing 2993 Mountain Lions. Since this is half again the estimated number of lions in the state, these animals are obviously suffering heavy harassment. DWR doesn't conjecture how many pursuers kill, or how many legal kills go unreported.

Recent years have seen a new threat to bears and lions as the number of hunting guides multiplies to accommodate out-of-state thrill seekers. The big money paid by trophy buffs, and their disdain for "boondock" law enforcement, are strong temptations to poach.

One local hunting guide, who had let it be known that any game warden who messed with his poaching empire would end up dead in a ditch, was finally busted last year for lion hunting violations. Rumors have it that local rednecks get their biggest thrill hunting lions and bear in National Parks, including Capitol Reef and Zion.

The state's news media encourage the carnage, promoting hunts on TV sports. One grisly segment glorified a father-daughter killing team. The reporter accompanied the pair on a hunt, oohing and aahing as their dogs treed a lion. The kill wasn't shown, but the camera followed the girl and her father dragging the corpse to their pickup. The reporter gushed how heartwarming it was that this teenager chose to forego drugs in favor of wholesome family fun.

The summer of 1992 saw two highly publicized bear attacks. One involved a 10-year-old girl who was dragged out of a camper and mauled. From her hospital bed, the girl pleaded with wildlife officials to let the bear live. Her appeal was disdained as an army of trappers and sharpshooters combed the area, killing and wounding bears. Hunters are now using the attack to push for more bear permits.

Challenging this bloodlust mentality is the daunting task of a growing number of activists. The Utah Wilderness Association and Humane Society of Utah have led efforts to reduce hunting of several rare species, including the Sandhill Crane.

UWA and HSU members now attend Wildlife Board hearings in large numbers, preventing redneck domination. The opposition's campaign to end the spring bear hunt generated impassioned testimony and hundreds of letters. The Board finally bowed to public pressure by announcing that the spring hunt was over.

Sweet as this victory was, it inspired a backlash that could leave wildlife worse off than ever. Bear hunters immediately ran to their flunkies in the state legislature. During the last session, legislators narrowly defeated H.B. 58, which would have authorized the spring bear hunt. Unfortunately, they passed H.B. 99, demoting foxes and skunks to the same unprotected status as Coyotes, hunted without any bag limits or license requirements at any time of the year. H.B. 79 was also passed, legalizing night spotlight hunting, the poacher's modus operandus.

Hunters have given notice that attempts to save rare wildlife will henceforth be addressed by the legislature, biological issues be damned. Before the first no-hunt spring arrived, ranchers began crying about massive bear depradations. Testimonials asserting bear-lion hunting as patriotic traditions and indispensable family values receive wide media coverage. Bear hunters have vowed to scream until they get their precious spring hunt back.

The trophy zealots do not seem to realize that their "tradition" is becoming so popular that it could run out of victims. Most Utahns blame wildlife scarcity on nonresident hunters, forgetting that our high birth rate, along with California white flight, mean more resident hunters every year. Strong evidence indicates that hunting pressure is so great that Black Bears and Mountain Lions aren't the only species in trouble.

Utah is one of the few states to sell unlimited deer hunting permits. DWR's addiction to this cash cow has resulted in the lowest buck to doe ratio in the West. Biologists say at least 20 bucks per 100 does are needed to maintain a healthy herd. The average ratio in Utah is 9 bucks to 100 does. Arizona, the next lowest state, has a 17 to 100 ratio. Utah deer observers see many does without fawns.

This year the Wildlife Board has responded to dwindling deer numbers by requiring hunters to choose between the archery, rifle, and black powder hunts. Most deer hunters, alarmed by the lack of targets, support this policy. Nonetheless, when it comes to other species, the hunters are not so understanding. The bill to restore the spring bear hunt may have only been the first salvo in an all-out attack on wildlife.

Whatever the outcome of the anti-wildlife bills, it's clear that efforts to preserve viable populations of bears and lions in Utah face an uphill battle. It's important that all Utah residents express their views on these hunts to the Utah Wildlife Board, c/o Division of Wildlife Resources, 1596 North West Temple, Salt Lake City, UT 84103.

— Leslie Lyon

Sources:

State of Utah Cougar Harvest 1991-92 Report, Division of Wildlife Resources

State of Utah 1992-93 Cougar and Bear Proclamation

Humane Society of Utah newsletters, Spring & Fall 1992

Utah Wildlife Federation News, September 1992

PREDATOR DEATH TOLLS

After receiving several articles pertaining to imperiled predators in the West, we thought readers would benefit from a tally of the overkill. Through phone conversations and mailings I have compiled data for nine Western states, and have included BC because of their especially desperate situation. Montana was excluded because an entire article could be devoted to MT's regulations alone.

Some points of clarification...1) Depredation permits can be obtained by any person when damage to property, cattle or people has occurred. I have listed the number of damage complaints and number of animals killed as a result. 2) In various states "no limit" is listed next to the number of permits sold, meaning unlimited numbers of permits are sold for a hunting season. 3) The population numbers are rough estimates based on scat, tracks and sightings. To confirm population estimates I contacted the ADC. Interestingly, their estimates are higher than the ones provided by agencies. (Their philosophy: the more predators there seem to be, the more acceptable it is to kill them.) 4) The kill numbers following the number of permits sold do not include depredation kills.

The hunting regulations look to be difficult if not impossible to enforce, (In Wyoming, for example, a female Cougar cannot be shot if a kitten is by her side, but agency employees will never escort every hunter to enforce this rule.) Even the acknowledged death tolls are outrageous. Citizens need to contact agencies, ask questions, utilize the Freedom of Information Act (FOIA; which gives citizens the right to materials from agencies), and keep updated on proposed hunting regulations.

NEW MEXICO (SOURCE: NM GAME AND FISH DEPARTMENT)

Black Bear, population: 3000-3500 (ADC 1988)
Hunting season: September 1 to October 31
1992 permits sold: 4829 (no limit)
1992 bear kill: 446 (59% male)
Permit cost: $10.50 resident, $151 non-resident

Hounds are legal for bear and Cougar hunting. The hunter must be present when the dogs are loose. Baiting is illegal.
ADC kill FY 1992: 1 target & 1 non-target bear killed
Mountain Lion, population: unknown
Hunting season: December-March
Average permits sold/year: 600-700 (no limit)
1992 permits sold: 765
1992 kill: 154 (72% male)
Cost of permit: $10.50 resident, $201 non-resident
ADC kill FY 1992: 11 target killed
Fur Bearers
Hunting Season: October 15-March 15
Permits: unlimited number sold "over the counter"
Bobcat
1992 tags issued: 3000
1992 kill: 1172

CALIFORNIA (SOURCE: CA DEPARTMENT OF FISH AND GAME)

Black Bear, population: 20,000-21,000
Hunting tags: 15,000 available/year, one bear kill per tag.
FY 1992 tags issued: 11,970
1992 bear kill: 1266, 2/3 males, averaging 4.1 years old; 1/3 female, averaging 4.7 years old.
Tag cost: $22.50 resident, $145.75 non-resident
Season: General season begins 2nd Saturday in October and runs 79 consecutive days. Archery season runs August 21-September 12. General season is closed once 1250 tags are returned to the Fish and Wildlife Office, hunters have 10 days to return tags after a kill. Dogs are allowed.
Depredation permits issued FY 1992: 126
Depredation kill FY 1992: 20 males, 2 females

Depredation permits are legal for an entire year, though restricted geographically.
Mountain Lion, population 1000-5100, are "specially protected mammals" in the state of California and have not been hunted since 1971.
1992 depredation tags issued: 182
1992 depredation kill: 81 (44% male, 30% female, others unspecified; 54 adult, others unspecified)
Bobcat, population: 74,000

An average of 6300 Bobcats a year are trapped for furs sent to Europe and the former Soviet Union. An average of 1000 are shot annually for sport. A package of five tags can be purchased for $8. S.B. 380 by Senator Tom Hayden would make the Bobcat a "specially protected" mammal and would ban commercial trapping and sport hunting. For more information contact The Mountain Lion Foundation, POB 1896, Sacramento, CA 95812; 916-442-2666.

COLORADO (SOURCE: CO DEPARTMENT OF WILDLIFE)

Amendment 10, passed in November 1992, eliminated hound hunting and baiting of Black Bears.
Black Bear, population 1992: 8-12,000
Permits sold 1992: 1995 (1041 spring, 954 September)
Bear kill 1992: 481 (135 female, 346 male)
Depredation kill 1992: 31 (3 female, 27 male, 1 unknown)
Damage complaints 1992: 81
Mountain Lion, population 1992: 2-3000
Licenses sold 1992: 876
Cougar kill 1992: 295 (120 female, 175 male)

Depredation kill 1992: 26 (10 female, 16 female)
Damage complaints 1992: 80

ARIZONA (SOURCE: ARIZONA GAME AND FISH DEPARTMENT)

Black Bear, population: 2250-2500
Hunting Season: Fall, unlimited tags issued, quota in certain areas. Spring, 154 tags issued
FY 1992 bear tags issued: 4381
FY 1992 bears killed: 124 (59% male, 41% female)
Tag cost: $11 resident, $150 non-resident
Depredation kill 1992: 1

Baiting and night hunting with lights is illegal, hound hunting is legal in the fall hunt. Female bears with cubs cannot be killed legally in the spring hunt. According to a Game and Fish employee, this is a "cosmetic regulation," meaning it can not be enforced, but "makes you feel good."

Mountain Lion, population 2500
Hunting season: Some regions are open year-round, others totally off limit to hunting.
Tags issued FY 1992: 2992 (no limit)
Kill FY 1992: 204 sport kill, 28 depredation kill=232 (57% male, 43% female)
Cost of Tag: $11 resident, $150 non-resident
Hound hunting is legal for Cougars.

OREGON (SOURCE: OREGON DEPARTMENT OF FISH AND WILDLIFE)

Black Bear, population: 20,000-25,000 (ADC 1988)
Tags sold general season (Aug-Nov) FY 1992: 16,573
Hunters who actually hunted: 11,882
Bear kill: 805 (555 males, 237 females, 13 unknown)
Hunter success: 7%
Tags sold spring hunt 1,265 tags
Hunters: 999
Bear kill: 155 (106 males, 40 females, 9 unknown)
Hunter success: 16%

Oregon and Idaho are the only states allowing spring, bait, and hound hunting of Black Bears.

1992 damage complaints: 291
Bears "removed dead": 220
Mountain Lion, population: 2500 (ADC 1988)
1992 tags sold: 517
Cougar kill 1992:186
1992 damage complaints: 151
Cougar "removed dead": 22

Citizens are required to report kills they make for damage control. This obviously is difficult to monitor. In June the Oregon FWS is publishing a Bear and Cougar Management Plan. Contact the office in Boise for a copy, 208-334-2920.

IDAHO (SOURCE: IDAHO FISH AND WILDLIFE DEPARTMENT)

Black Bear, population: 25,000 (ADC 1988)
Hunting season: fall and spring
Average tags issued/year: 17-20,000 (unlimited)
Average bear harvest/year: 1500-2000

Depredation: According to the FWD an insignificant number of Black Bear are killed with depredation permits each year; however, ADC statistics show 12 bear killed in 1992.

Mountain Lion, population: 1900 (ADC 1988)
Hunting season: Depends on area, ranges from September-March
Average tags issued/year: 2000 (unlimited)
Average Cougar kill/year: 250-300
1992 depredation kill: 4 (ADC)

NEVADA (SOURCE: NEVADA FISH AND WILDLIFE DEPARTMENT)

Black Bear, population: 300
No bear hunting season
Mountain Lion, population: <1500
Hunting season: October 1-April 30

A harvest objective is set by each region and once the hunting quota has been reached the unit is closed and hunters must get another permit for other unit areas. A limit of 200 lions state-wide can be taken per year. Hounds are legal.

Tags issued 1991-92: 619 (unlimited)
Cougar kills 1991-92: 125 (82 male, 43 female)
Depredation kill 1991-92: 62 (38 male, 24 female)
Tag cost: $50 resident, $150 non-resident

WASHINGTON (SOURCE: DEPARTMENT OF WILDLIFE)

Black Bear, population: 22,000
Hunting season: Westside: August 1-October 3, Eastside: September 1-October 25
Tags sold 1992: 13,525 (no limit)
Bear kill 1992: 1442 (921 males, 521 females)
Tag cost: $18 resident, $180 non resident

In 1985 a "feeding program" was started on the Westside to prevent bear from eating the bark off trees in plantations. In 1991, 4 bear were killed with depredation permits because they "couldn't be handled through bear feed."

Grizzly Bear population is 10-20 and is protected with Threatened status. In August/September 1993 the Department of Wildlife will introduce for public review a North Cascades Grizzly Bear Recovery Plan.

Mountain Lion, population estimate: 1500
Hunting seasons: October 16-November 23, November 24-January 21
Average kill/year: 100
1992 tags sold: 262 (2773 applicants)
1992 Cougar kill: 140 (54 female, 86 male)
Other kill: 6 damage problems, 3 tribal kills*, 2 road kill, 1 illegal kill, 2 self defense kill, 1 kill in wrong unit, 2 unknown
Tag cost: $24 resident, $360 non-resident

Each season a limit is set on the number of permits for each region. In 1993, 307 permits will be issued state-wide.

Depredation: Less than 5 lions are killed each year with depredation permits.

Hunting with hounds is legal for both lion and bear.

*Tribes are allowed to kill lions without licenses or tags, they must report kills to the Department of Wildlife.

WYOMING (SOURCE: WY GAME AND FISH DEPARTMENT)

Black Bear, population: 3000
Hunting season: spring and fall (September 1-November 15)
Tags sold 1991: 4038 (no limit)
Bear kill 1992: 241
Tag cost: resident $11, non resident $70

Hounds and spotlights are not legal. Spotlights can be used for Coyote and other fur bearing animals, and they can be used on private land. Killing "problem" bears is rare according to the Fish and Game office; they are usually trapped and relocated.

ADC statistics: 1 depredation kill 1992

June 1993: Under threat of lawsuit from the Fund For Animals (850 Sligo Ave., Suite 300, Silver Spring, MD 20910) and Friends of the Bow, the US Forest Service has agreed to prohibit hunters from using bait to attract and kill bears on National Forests in WY, pending establishment of a national FS policy on bear baiting.

Mountain Lion, population: 1500 (ADC 1988)
Hunting season: September 1-March 31, varying in each of the 23 hunting regions. Each unit has a quota. Once the quota is reached the area is closed to hunting.
1991-92 lion kill: 72 (Including depredation kills, which are "rare.")
Age limit: In most states a person only need be 12 years old, or 10 if he or she has completed a fire-arm and safety course, to purchase a hunting tag.

BRITISH COLUMBIA

Black Bear, population: 60,000-120,000 (1990 figures)
Average bear kill per year: 5000

It is estimated that as many animals are poached each year as are killed legally. Few records are kept of bear kills and every B.C. resident with a hunting licence can get a permit to kill 2 bears. The sale of body parts has increased greatly, with gall bladders now selling for over $15,000 in Asian markets. On 1 February 1993 the sale and possession of bear gall bladders and genitalia was made illegal in B.C. However, trade is extremely difficult to monitor. Animal body parts can easily be hidden or disguised.

In Clayoquot Sound bear populations have decreased due to fish farms, people with permits to kill nuisance animals, trophy and sport hunting, poaching and loss of habitat and food sources.

For more information contact Bear Watch, POB 394, Tofino, B.C. VOR 2ZO. Bear Watch is encouraging an end to the spring bear hunt, marine hunting, trophy hunting, and use of dogs and tracking devices in bear and Cougar hunts; and advocates protection of Clayoquot Sound as a wildlife viewing area.

—Kathleen Fitzgerald

ANIMAL DAMAGE CONTROL: AN UPDATE

Under the guise of protecting agriculture, the United States government annually kills more than 2.5 million animals at a cost of more than $30 million. Federal animal control experts move, disperse, or accidentally capture another 32 million animals. The government agency responsible for these "control operations" is Animal Damage Control (ADC), an agency of the Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture.

More than 90% of the creatures affected by ADC are birds, primarily species of blackbird which eat crops such as sunflowers and corn. Aircraft disperse birds with noise or chemicals. ADC activities affect less than 10% of the nation's blackbird population, and this aspect of the ADC program receives only minor criticism from ADC's critics.

The controversy centers on ADC's lethal control of predators. ADC agents use leghold traps, usually leading to a slow, painful death for the victim. ADC also kills animals with poisons and snares.

Shepherds in other parts of the world have long used guard dogs and watchmen to keep predators from feeding on their flocks. However, the ADC program does not require responsibility by ranchers before the use of lethal control. ADC's non-lethal control and education programs receive less than 20% of the ADC budget.

Especially controversial is ADC's predator control on public lands. To protect livestock grazing on public lands, ADC controls predators under "memorandums of understanding" with the Forest Service and the Bureau of Land Management.

ADC has been forced to stop operations on some state lands. President Clinton recently appointed an old ADC foe, Jim Baca, as the new director of the Bureau of Land Management (BLM). In his former job as New Mexico's State Lands Commissioner, Baca stopped all ADC activity on state-owned lands in his state.

While ADC claims to be scaling back its operations, statistics show an increase in the number of animals killed. In fiscal year 1987, ADC killed 76,410 large predators—foxes, bears, large cats, Coyotes, and wolves. By 1991, the toll had risen to 107,471 large predators killed. Coyotes, bane of Western sheepmen, are the primary ADC target, constituting 95% of these animals killed.

Early this year, the Wyoming ADC office fired an agent who had previously been convicted of poaching eagles in Texas. Sting operations in Colorado and Utah have provided circumstantial evidence that ADC has assisted ranchers in obtaining and using illegal poisons imported from Mexico.

In recognition of its negative reputation, ADC began a public relations campaign. In 1991, ADC hired a public affairs specialist, Stuart McDonald. McDonald proudly points to ADC's programs that protect endangered species from predators and aircraft from birds.

More dramatic, ADC may try to change its name to "Wildlife Services" as a way of making its mission sound more palatable.

ADC is preparing an Environmental Impact Statement (EIS) to comply with the National Environmental Policy Act. The latest draft of the EIS was issued in January 1993. The 2-volume, 1100-page document covers every aspect of the ADC program, with the expressed goal of determining the program's future directions.

The EIS examines three alternatives for the ADC program: continuing the current program, eliminating ADC entirely, or changing to a plan that compensates farmers and ranchers for wildlife losses. Keeping the current program is presented as the preferred alternative.

The EIS does not seriously consider the option of having ADC redirect its focus from lethal control to educating ranchers and farmers in non-lethal control techniques. The draft EIS lists non-lethal control methods as the first line of defense, but the ADC record clearly shows that ADC uses lethal control methods in the vast majority of cases.

ADC critics point out that the agency lacks or ignores biological knowledge required to make appropriate decisions. For example, ADC continues killing Coyotes despite scientists having found that these canines respond to lethal control with increased birth rates—quickly replenishing their population and escalating predation to feed their young. Furthermore, eliminating Coyotes can cause dramatic increases in rodent populations.

Several organizations work to eliminate or reform ADC. Wildlife Damage Review (POB 2541, Tucson, AZ 85702) produces newsletters and educates the public about ADC. Predator Project (POB 6733, Bozeman, MT 59771) focuses on many predator-related issues, including ADC.

A copy of the draft EIS can be obtained by writing to: George Graves, ADC Operations Support Staff, 6505 Belcrest Road, Hyattsville, MD 20782

You can also contact ADC's public affairs specialist for further information: Stuart McDonald, ADC Western Regional Office, 12345 West Alameda Parkway, 3rd Floor, Suite 31, Lakewood, CO 80228

I've produced a 16-page statistical report about ADC activities, which I make available either via my computer bulletin board system (719/633-5229) or mail. If you want a copy, please send a self-addressed envelope and $2 to: Coyote Gulch Productions, 423 North Cooper Avenue, Colorado Springs, CO 80905-1120

—Scott Robert Ladd, Colorado Springs, CO

WASHINGTON'S LYNX TWO STEPS CLOSER TO PROTECTION.

Efforts to protect Lynx leaped forward with two government decisions made in March. The Washington Department of Wildlife recommended that Lynx be listed as threatened under state regulations. Also, the US Interior Department agreed to revisit a decision it made last year to not list the north-central Washington Lynx population under the Endangered Species Act. Both actions result from petitions filed in 1991 by the Greater Ecosystem Alliance (GEA) and allied groups.

The largest known population of Lynx remaining in the Lower 48 occurs in north-central Washington, in high-elevation forests known as the Okanogan Meadows. Habitat conditions for Lynx have declined there due to five decades of fire suppression. Now the Okanogan National Forest and Loomis State Forest are preparing major road-building and logging projects which could devastate the Lynx population.

Last August, GEA, Friends of the Loomis Forest, National Audubon Society, Humane Society of US, Defenders of Wildlife, Sierra Club Cascade Chapter, Save Chelan Alliance, Tonasket Forest Watch, and North Cascades, Pilchuck, and Lower Columbia Basin Audubon Societies filed a lawsuit against the US Fish and Wildlife Service challenging their decision against listing the Lynx. This past April 27, the suit was settled by the agency agreeing to review the petition, along with additional information, by June 18.

The Washington Department of Wildlife, meanwhile, conducted a review of Lynx status state-wide. On March 17, the Department gave public notice of its recommendations to list not only Lynx, but Marbled Murrelet, Western Pond Turtle, Larch Mountain Salamander, Oregon Silverspot Butterfly, Pygmy Rabbit, Northern Sea Lion, and Western Gray Squirrel. After 90 days of public comment, the Washington Wildlife Commission, which oversees the department, will consider these recommendations.

State and federal listing of Lynx would force new guidelines on the Forest Service and DNR which could help protect Lynx habitat. GEA recently distributed 35,000 post card packets about the Lynx issue, generating requests to the Forest Service and DNR that they not log during the listing process.

As Congress and the Clinton administration continue to stonewall Eastside forest protection, Lynx needs may be one more way of maintaining roadless areas and high-elevation old-growth forest. Lynx protection may even restore wildfire to our wildlands.

Please Help!

The Department of Wildlife is soliciting public comment on whether to list Lynx and the other seven species. Please send your comments, including any biological information you have, to the address below. Send a copy to Dean Lydig, Chair of the Wildlife Commission, at the same address. In your letter, thank the Department for their excellent research, and support their recommendation to list Lynx as threatened.

Harriet Allen, Endangered Species Program manager
Wash. Dept. of Wildlife
600 Capitol Way N.
Olympia, WA 98501-1091

—Reported by GEA, POB 2813, Bellingham, WA 98227

MULTIPLE SPECIES LEGAL ACTIONS TAKEN TO SAVE THE SELKIRK ECOSYSTEM

The Selkirk Ecosystem lies in the northern part of the Idaho Panhandle, the northeast corner of Washington, and southern British Columbia. It is a transborder ecosystem supporting exceptional biodiversity. It is the last area in the lower US that still supports the full complement of Rocky Mountain megafauna. Woodland Caribou, Grizzly Bears, Gray Wolves, Wolverine, Lynx, Northern Goshawk, Marten, Fisher, Boreal Owls, and Northern Bog Lemmings still exist all together in the Selkirk Mountains.

However, under extreme political and economic pressure from regional timber interests, officials of the Idaho Panhandle and Colville National Forests routinely violate environmental laws. Timber cutting levels continue to be arbitrarily set at unrealistic levels, to the detriment of many native species. As a result of ongoing forest destruction, both Woodland Caribou and Grizzly Bear recovery programs are failing in the Selkirk Ecosystem, and Marten, Lynx, Wolverine, and Goshawk numbers are believed to be in decline.

Despite the biological significance of this ecosystem, the US Forest Service has failed to manage its National Forests in the Selkirks for preservation of natural diversity. And due to local political and economic pressure, the US Fish and Wildlife Service (FWS) has resisted implementing multi-species recovery plans on an ecosystem basis. The actions of both agencies appear to be in conflict with stated new policies of the Clinton/Babbitt team in Washington. In response, a coalition of environmental groups and grassroots activists have taken a number of legal actions.

On March 30, the coalition filed a 60-day formal notice of intent to file suit against the United States Fish and Wildlife Service in a renewed effort to protect the critically endangered Selkirk Grizzly Bear population. The Selkirk Grizzly Bear population is biologically endangered due to low numbers, hunting pressure, and habitat destruction. Biologists estimate that fewer than 35 Grizzlies remain in the Selkirks—a number far too small to prevent this Grizzly population from going extinct unless habitat restoration is undertaken. This population is especially vulnerable to further habitat loss due to clearcutting, roading, and other human developments, as well as intentional and inadvertent shooting. Inadequate road closures are also a major concern.

The Grizzly Bear (*Ursus arctos horribilis*) is presently only listed as a Threatened species under the Endangered Species Act. However, the Act provides for the listing of species *and populations of species* as Threatened or Endangered. Endangered species receive more protection under the Act than Threatened species. Because Grizzlies have only Threatened status, the US Fish and Wildlife Service and US Forest Service have excessive flexibility and are allowing the continuing fragmentation and degradation of Grizzly Bear habitat in the Northern Rockies.

In January of 1991, Jasper Carlton petitioned the US Fish and Wildlife Service to reclassify the Selkirk Grizzly Bear population from Threatened to Endangered. On 20 April 1992, FWS found that Carlton's petition presented substantial evidence that these Grizzlies should be reclassified as Endangered, but in a 12 February 1993 Federal Register announcement, FWS ruled that the requested action was not warranted. The Biodiversity Legal Foundation's latest legal action for Grizzlies challenges the validity and legality of this decision.

The case will be brought on behalf of Jasper Carlton, Biodiversity Legal Foundation (BLF), Bonners Ferry Forest Watch, Predator Project, American Wildlands, David Hunt, Jari Preston, the Selkirk-Priest Basin Association, the Alliance for the Wild Rockies, Montana Ecosystem Defense Council, Wild Forever Grizzly Bear Project, Greater Ecosystem Alliance, and the Great Bear Foundation by SCLDF (Sierra Club Legal Defense Fund; not affiliated with the Sierra Club) attorney Doug Honnold.

In addition to this legal action on behalf of the Grizzly Bear, BLF and Greater Ecosystem Alliance (GEA) have warned the FWS that federal court action will be pursued if the agency does not designate Critical Habitat for the Selkirk's seriously imperiled population of Woodland Caribou (*Rangifer tarandus caribou*). Only about 50 of these Caribou remain, yet the Forest Service continues to cut trees and build roads into their last remaining old-growth habitat. The BLF and GEA are awaiting a Fish and Wildlife Service rulemaking decision on a formal petition to designate Critical Habitat for the Caribou filed by the BLF last year.

In addition to Woodland Caribou and Grizzly Bears, at least one aquatic species in the Kootenai River, at the lowest elevations of the Selkirk Ecosystem, is critically imperiled by habitat destruction in the Selkirks. The Kootenai River White Sturgeon (*Acipenser transmontanus*) is confined to about 168 miles in the Kootenai River, principally upstream of Cora Linn Dam from Kootenai Lake, British Columbia, through the northeast corner of the Idaho Panhandle to Kootenai Falls, 31 miles below Libby Dam, Montana.

The most recent survey data available indicate that the total sturgeon population has been reduced to less than 1000 individuals. The urgency of the situation is demonstrated by the lack of evidence of any recruitment of juvenile sturgeon in the Kootenai River since 1974, when Libby Dam in Montana began operating.

According to the Idaho Department of Fish and Game, the estimated number of sturgeon in the Kootenai River declined from 1194 in 1982 to only 880 in 1990. Apparently all of these individuals are mature or maturing sturgeon. With no recruitment of juveniles into the population, unknown sturgeon mortality due to continuing hook and line fishing for other species, and natural mortality, the Kootenai River White Sturgeon are in danger of extinction. Contaminants have been found in sturgeon eggs; their potential for adversely impacting sturgeon reproduction is unknown. Fishery biologists agree on the need for a regulated discharge of water through Libby Dam to achieve more natural spring flows which would enhance natural sturgeon reproduction in the Kootenai River. However, in the spring of this year, the US Fish and Wildlife Service was unsuccessful in efforts to secure an enforceable agreement with the US Corps of Engineers and Bonneville Power Administration (BPA) to implement interim flow proposals developed and recommended by the Sturgeon Technical Committee.

Analyses by the Sturgeon Technical Committee and FWS Boise Field Office suggest that drafting of the Libby Dam Reservoir by BPA during the past two years has been contrary to proposed and critically needed sturgeon spawning period flow rates in the Kootenai River. Scientific data show that natural high spring flows during the sturgeon's spawning period must be reestablished in the Kootenai River if the fish is to survive and recover. Slack water and slough habitat areas along the Kootenai River flood plain must also be restored in order to protect juvenile sturgeon. Immediate federal listing and protection under the ESA will be required to accomplish these habitat restoration goals and remove present severe threats to the species.

The Idaho Conservation League submitted a petition to FWS on 8 June 1992 requesting a regular rule to list the Kootenai River population of White Sturgeon under the ESA. Responding to new biological information on the plight of the sturgeon, the Biodiversity Legal Foundation petitioned FWS on 1 April 1993 to emergency list the species as Endangered. In addition, the BLF filed a 60-day formal notice of intent to file suit against the Fish and Wildlife Service in an effort to end the bureaucratic foot-dragging in the case.

"What is at stake here is not only the health and viability of these important Grizzly Bear, Woodland Caribou, and sturgeon populations, but the ecological health of the unique Selkirk Ecosystem," claimed Jasper Carlton, coordinator of the multiple-species approach. "Protecting the habitat of these species ensures that these ecosystems and their complete biodiversity have a chance to survive and flourish."

What you can do: Write to Secretary of Agriculture, Mike Espy , US Dept. of Agriculture, 14th Street and Independence Ave., S.W. Washington, DC 20250, and Secretary of the Interior Bruce Babbitt, US Dept. of the Interior, 18th and C Streets, NW, DC 20240, urging them to support improved protection for the Grizzly Bear and the biological integrity of the Selkirk Ecosystem.

—Reported by The Biodiversity Legal Foundation, POB 18327, Boulder, CO 80308-1327.

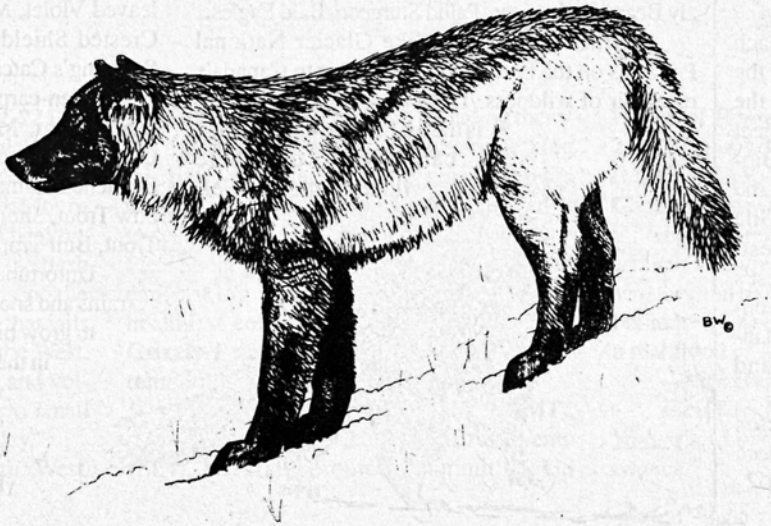


illustration by Brush Wolf

LEGAL PROCEEDINGS INITIATED FOR LOACH MINNOW AND SPIKEDACE

Matthew Kenna, a Durango lawyer, has filed a formal 60-day notice of intent to sue the US Fish and Wildlife Service (FWS) on behalf of the Greater Gila Biodiversity Project and the Southwest Center for Biological Diversity. FWS is in violation of the Endangered Species Act for not designating Critical Habitat for the Loach Minnow or the Spikedace, two critically imperiled Southwestern fish. The lawsuit will be filed in July of 1993 if Critical Habitat has not been designated by then.

The Loach Minnow and the Spikedace were listed as Threatened in 1985 and 1986. A poor Critical Habitat package was proposed for both in 1985, but was never finalized due to intense political pressure from the cattle and mining industries and several county governments. Since then, the species' habitat has continued to be degraded by overgrazing, dewatering, logging and human-exacerbated flooding. The Fish and Wildlife Service, meanwhile, has done little to protect either fish. Immediate, formal designation of Critical Habitat is essential if these species are to survive.

Efforts to protect the Loach Minnow and Spikedace mark the beginning of a campaign by the Greater Gila Biodiversity Project and the Southwest Center for Biological Diversity to preserve the native fishes of the Greater Gila Ecosystem and the Southwest. Ninety percent of the Southwest's native fishes are biologically endangered due to habitat loss and introduction of exotic fishes and amphibians.

—Kieran Suckling, Director, Greater Gila Biodiversity Project, POB 742, Silver City, NM 88062

TAKE BACK THE YAAK

DNA tests on the tooth of the black wolf killed near Yellowstone National Park prove to scientists the very thing that open hearts have believed for years: Canadian wolves, and other wild creatures, can reach Yellowstone in a hop, skip and a leap, if the corridors are there—the linkage zones between ecosystems, and between the corridors themselves (a matrix of wildness). A few more such "hops" as the Ninemile wolf made will place wolves in Utah—back in the Uintas—then over into Colorado, down into the San Juans, and on back to Mexico, where the land and any remaining gene pools will ultimately reshape these new populations into the genetically wild species they once were.

Where once we were talking in terms of metaphors and dreams, hope and yearning—a Canada-to-Mexico connection for wildness, and then a matrix—we are now dealing with facts. The land is trying to heal itself, trying to come back together like flesh knitting a scar back together—the scar of humans and development on either side of the Divide. Scientists are finally starting to see what we have been dreaming for years. Now the politicians must follow.

Critical to the West's self-recovery is a quarter-million acre area in northwest Montana called Yaak Valley. The Yaak has been overlooked in previous wilderness bills because people think it's ugly: low-elevation rainforests, where you can rarely see the tops of the rockless, ice-free mountains. The only vistas are those afforded by the many huge clearcuts.

Despite heavy clearcutting there for decades (the Yaak produces more timber annually than any other valley in Montana), key indicator species still hang on in the Yaak, though often in single-digit populations: Gray Wolves, Woodland Caribou, Grizzly Bears, Wolverines, Pallid Sturgeon, Bald Eagles...

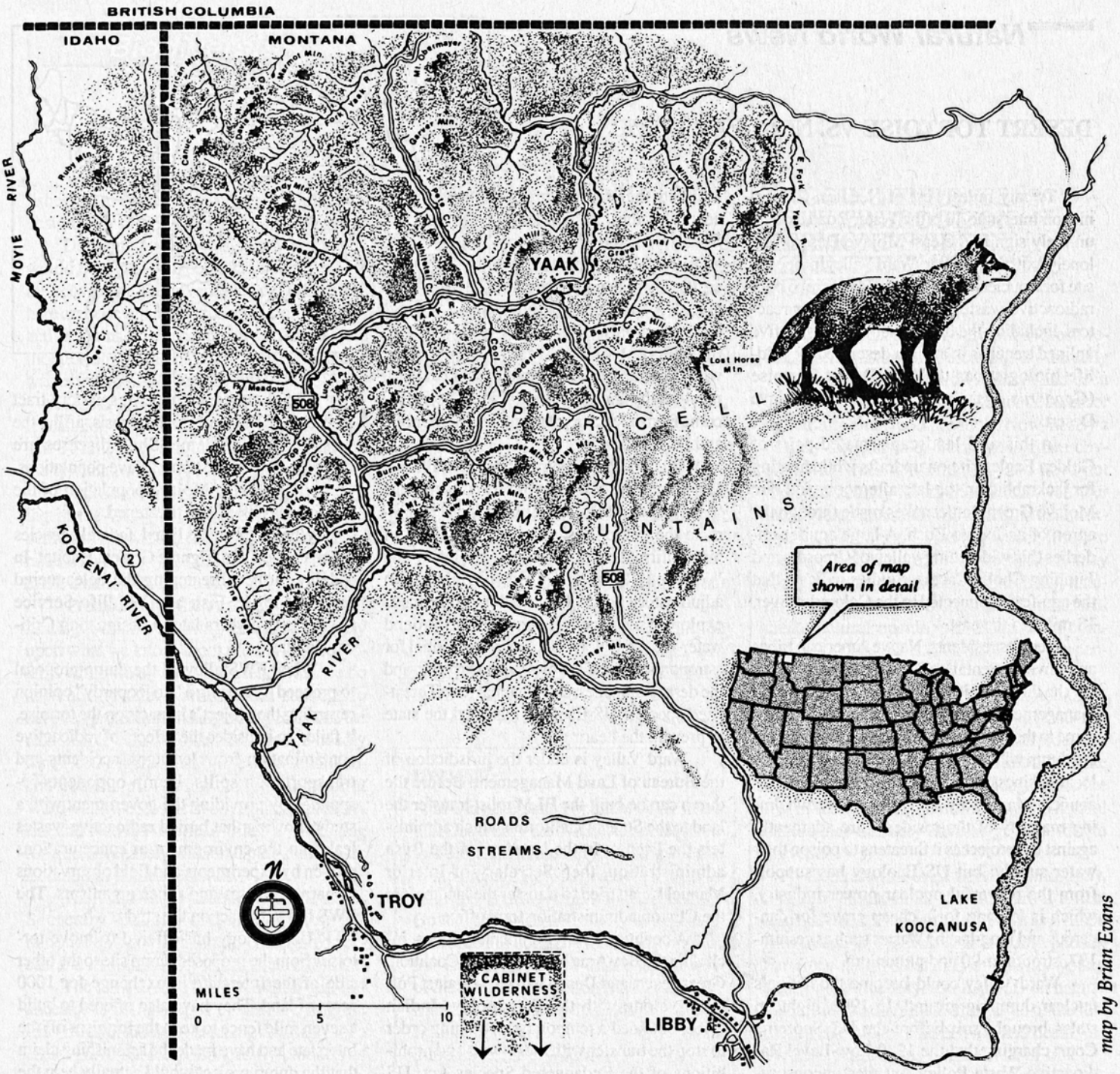
Furthermore, Yaak—like Glacier National Park—is on the border and has access to Canada's reservoir of wildness. The west boundary of Yaak is the Idaho state line, so Yaak can serve to distribute wildness into the Selkirks of Idaho (and the rest of the Northwest) in addition to sending wildness south—into the Ninemile Valley, the Bitterroots, Yellowstone...

illustration by Bob Ellis

...the thick tangle of Yaak is not a wilderness for backpackers or campers, but rather, for the truly wild things...

Yaak is unique—a place where the Northern Rockies crash into the Pacific Northwest, and as a result, a place flush with biodiversity. Yaak is a harbor for wildness in the West, a genetic reservoir for almost all species found in the Northern Rockies. I also believe the animals in the Yaak are slightly different, slightly more secretive—more deep jungle oriented—than animals of the same species in the Glacier thoroughfare, only two valleys to the east. Yaak is small, but critical to the West in the way that one's fist-sized heart is critical to the human body. Five acres in Yaak can contain more diversity, more seething wildness, than a hundred acres in larger valleys. Consisting almost exclusively of federal (Forest Service) lands, the thick tangle of Yaak is not a wilderness for backpackers or campers, but rather, for the truly wild things: Marten, Mink, Moose, Gray Wolf, Wolverine, Grizzly Bear, Raven, Badger, Weasel, White-tailed Deer, Mule Deer, Elk, Woodland Caribou, Great Gray Owl, Golden Eagle, Bald Eagle, Osprey, Flammulated Owl, Peregrine Falcon, Boreal Owl, Townsend's Big-eared Bat, Harlequin Duck, Lynx, Common Loon, Black-backed Woodpecker, Pileated Woodpecker, Pallid Sturgeon, Wavy Moonwort, Mingan Island Moonwort, Small Lady's Slipper, Round-leaved Orchid, Sparrow's Egg Lady's Slipper, Kidney-leaved Violet, Maidenhair Spleenwort, Bog Birch, Crested Shield-fern, Green-keeled Cottongrass, Spalding's Catchfly, Linear-leaved Sundew, Northern Golden-carpet, Northern Bog Lemming, Fisher, Black Bear, Muskrat, Bobcat, Beaver, Ruffed Grouse, Spruce Grouse, Blue Grouse, Coeur D'Alene Salamander, Torrent Sculpin, Inland Rainbow Trout, Shorthead Sculpin, Westslope Cutthroat Trout, Bull Trout, White Sturgeon...

Unfortunately for those wild things, the heavy rains and snows combine with the low elevations to grow big trees, and to grow trees faster than in the rest of the Rockies. The Forest Service and Champion International are converting the Yaak's diverse mixed conifer forest into diseased Lodgepole Pine plantations.



map by Brian Evans

The Yaak has two small (about 22,000 acres each) but vital roadless areas which need protection from the sawmills: Roderick Mountain/Grizzly Peak, and Mt. Henry/Pink Mountain/Gold Hill. These basins are still healthy, and are critical to knitting that flesh—the flesh of wildness—back over the wounds of the West. Any wildland plan for the West that fails the Yaak will, I feel, ultimately fail the West. We must save—by the sheer muscle and volume of our letters—at least these two small roadless tracts with the timbered valley.

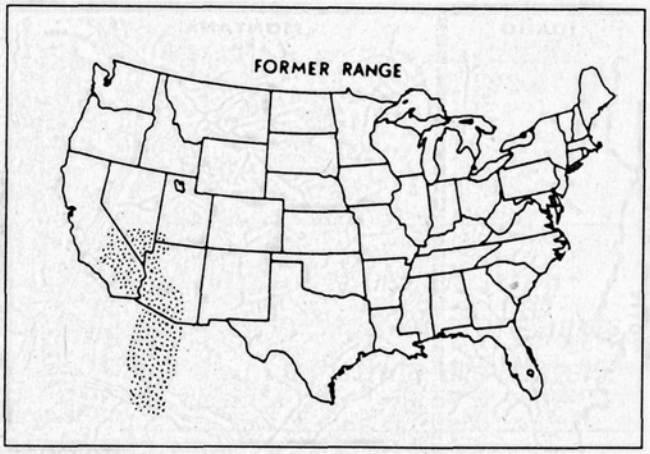
The wolves are coming back to the West. The Grizzlies in Colorado are revealing themselves to us again. We must do the right thing this time, and I feel that it begins up on the Canadian line, in a tiny valley that has no one to speak for it over the roar of the chainsaws. Please send as many cards and letters as you can, asking for protection of Yaak's two healthiest core areas: Roderick Mountain/Grizzly Peak, and Mt. Henry/Pink Mountain/Gold Hill.

Please send letters to: Pat Williams (MT), George Miller (CA: Chair), and Bruce Vento (MN), Natural Resources Committee, US House of Representatives, Washington, DC 20515; and to Max Baucus (MT), Dale Bumpers (AR), and Bennett Johnston (LA: Chair), Energy and Natural Resources Committee, US Senate, Washington, DC 20510; and send a copy of your letter to your own US senators and representatives. Because the timber industry has kept Yaak a secret, it will take a real flood of letters to wake Congress.

—Rick Bass

Rick Bass is the author of The Ninemile Wolves and other works of a Montana provenance.

DESERT TORTOISE VS. NUCLEAR DUMP



Twenty miles west of Needles, California, on Interstate 40 is the Water Road exit, an unlikely sign in the east Mojave Desert. The lonely exit road leads to Ward Valley, proposed site for a nuclear waste dump. Plans are to bury radioactive wastes from nuclear power reactors, including the dismantled reactors, in five unlined trenches in an area described by wildlife biologists as the best Desert Tortoise (*Gopherus agassizii*) habitat in the Mojave Desert.

In this arid landscape, mated pairs of Golden Eagles kite on updrafts while hunting for jackrabbits in the late afternoon; and rare Mojave Green Rattlesnakes rustle through the apron of an Indigo Bush. A large aquifer underlies this wide tilting valley of Creosote and Jumping Cholla Cactus. Studies indicate that the aquifer is connected to the Colorado River, 18 miles to the east.

Needles residents, Native American tribes and environmental activists have been fighting the dump project since 1990 when a waste management firm by the name of US Ecology came to the remote desert community peddling the dump with promises of jobs and money for local businesses and public schools. The city council, Mayor Roy Mills and an overwhelming majority of the residents are adamantly against the project as it threatens to poison their water supply; but US Ecology has support from the powerful nuclear power industry, which is looking for a cheap grave for dangerous and long-lasting wastes such as cesium-137, strontium-90 and plutonium.

Ward Valley could become the nation's nuclear dumping ground. In 1992, eighteen states brought suit before the US Supreme Court charging that the 1980 Low-Level Radioactive Waste Policy Act was unconstitutional. Written largely by nuclear industry lobbyists, the Act required states to take title and responsibility for radioactive wastes generated within their borders. The Supreme Court ruled that the "take title" provision of the Act violated the constitution. If California becomes the first state to open a dump, the Nuclear Regulatory Commission can use "emergency access powers" to ship nuclear wastes there from anywhere in the nation.

Dump proponents have engaged in an aggressive public relations campaign to market the landfill as a repository for medical wastes, warning that all research and treatment involving radioactive materials will cease if the dump is not approved. Governor Wilson has insisted that radiopharmaceutical companies will leave California if the dump is not built. But a Department of Energy study of the waste stream slated for the desert dump shows that only a fraction of one percent of the waste would come from medical sources and that most of the long-lived radionuclides would come from nuclear reactors such as San Onofre and Diablo Canyon.

One of US Ecology's strongest allies is Governor Pete Wilson, who has directed the State Department of Health Services to promote the dump. Last year, as a condition of his confirmation as Secretary of Health and Welfare, Russell Gould promised an adjudicatory hearing on the dump project, to explore issues such as the threat to ground water and the Colorado River, the potential for astronomical liability costs to the taxpayer, and the destruction of essential habitat for a Threatened species. US Ecology has sued the state to prevent the hearing.

Ward Valley is under the jurisdiction of the Bureau of Land Management. Before the dump can be built the BLM must transfer the land to the State of California which administers the license. In the last days of the Bush administration, then Secretary of Interior Manuel Lujan tried to transfer the land before the Clinton administration took office.

A coalition of environmental groups, including the Bay Area Nuclear Waste Coalition, Greenpeace, and Desert Citizens Against Pollution, along with the Fort Mojave Indian Tribe, obtained a temporary restraining order to stop the transfer with the powers and prohibitions of the Endangered Species Act. US Ecology and the State of California tried to intervene on the side of the federal government, seeking to force the land transfer. Soon after his confirmation, Interior Secretary Bruce Babbitt rescinded Lujan's actions but has yet to decide on the fate of Ward Valley.

According to the recently released US Fish and Wildlife Service Desert Tortoise Recovery Plan, Ward Valley is "currently the largest and most robust population of desert tortoises remaining within the geographic range." The tortoise has recently suffered an alarming and precipitous population decline. Approximately half of the population has been lost in the last seven years due to habitat destruction from urbanization, mining, livestock grazing and off-road vehicle use.

Two diseases, an upper respiratory tract disease (URTD) and shell necrosis, afflict the western Mojave deme. Shell diseases are creeping into the eastern Mojave populations. In April 1990, the Mojave population of the tortoise was listed as Threatened.

When a species is listed, federal agencies are mandated to designate Critical Habitat. In a delay further threatening the beleaguered reptile, the US Fish and Wildlife Service (FWS) is two years late in designating Critical Habitat.

When FWS allowed the dump proposal to proceed by issuing a "no jeopardy" opinion regarding the project's impacts on the tortoise, it failed to consider the effects of radioactive contamination from leakages, accidents and transportation spills. Dump opponents responded by providing the government with a study showing that buried radioactive wastes leak into the environment at concentrations proven by experiments and field observations to harm tortoises and other organisms. The FWS has yet to act on the study.

US Ecology has offered to move tortoises from the proposed dump site to the other side of the Interstate in exchange for 1000 acres of land. They have also offered to build a seven mile fence to keep the tortoises off the Interstate and have made the astonishing claim that the dump project would actually help the tortoise.

Translocations are known to result in the loss of individuals and are prohibited by the BLM and the California Department of Fish and Game except under certain conditions where tortoises are moved from already degraded habitats. The Desert Tortoise Recovery Plan calls on the government to construct the tortoise fence as part of an overall conservation strategy.

The Recovery Plan recommends that Ward Valley be included in a 1000 square mile Desert Wildlife Management Area (DWMA) protected from all habitat degrading activities including landfills. Although it is only an advisory document, the Recovery Plan estab-

lishes Ward Valley as a prime candidate for designation as Critical Habitat.

Dumping nuclear wastes at Ward Valley would eventually disperse radionuclides into the ecosystem. To prevent such contamination here and elsewhere, source reduction of radioactive toxins must accompany an immediate moratorium on the production of radioactive wastes from commercial nuclear power reactors.

This spring the Aha Macav Indian Tribe is planning a Spirit Run through Ward Valley. The 30 mile relay run, uniting the political and the spiritual, will begin at the proposed dump site and proceed to an ancient aboriginal dwelling in the Old Woman Mountains. The red ochre canyon walls at the destination are decorated with petroglyphs depicting falcons, a tortoise, a handprint, the sun.

Protection for the tortoise would represent a gift of time enabling us to act decisively upon what we know about preserving ecosystems while we try to comprehend what we do not know. There is an essential connection between protecting endangered species and the responsible care of toxins that remain deadly for 12,000 generations. While a lawsuit in federal court is preventing the land transfer at Ward Valley, ecologists, environmental activists and Native American tribes are working for a comprehensive national plan for the safe isolation of nuclear poisons.

The Ward Valley issue represents a test of Secretary Babbitt and the Clinton administration's commitment to endangered species and its vulnerability to corporate influence.

The fight to save this 70 million year old ancestor is being waged against a dying but still powerful industry searching anxiously for a cheap grave for the poisonous by-products of forty years of misguided national energy policies.

WHAT YOU CAN DO:

Write to Secretary of the Interior Bruce Babbitt and tell him that if he allows Ward Valley to become a nuclear dump he will push the Desert Tortoise toward extinction and guarantee nuclear contamination of the Colorado River and the Mojave Desert for the next 12,000 generations.

Secretary of the Interior Bruce Babbitt
1849 C Street NW
Washington, DC 20530

Write to Vice-President Al Gore and urge him to outlaw nuclear landfills and hold national hearings on the problem of nuclear waste containment.

Vice-President Al Gore
Old Executive Office Building, Room 358, Washington, DC 20500

For more information, contact the Bay Area Nuclear (BAN) Waste Coalition, 2760 Golden Gate Ave, San Francisco, CA 94118, Ph:(415) 752-8678 or (518) 658-2135.

—Philip M. Klasky, Ban Waste Coalition

UPDATE:

In May the state appellate court ruled that Governor Pete Wilson is not required to hold an adjudicatory hearing on the dump project. He was given the option to hold the hearing, and he opted not to. Governor Wilson and allies have quickly proceeded in licensing the dump contractor. Currently, all that stands in the way of the dump construction is a federal land transfer. This makes letters to Secretary Babbitt and Vice-President Gore even more imperative. *—KHF*

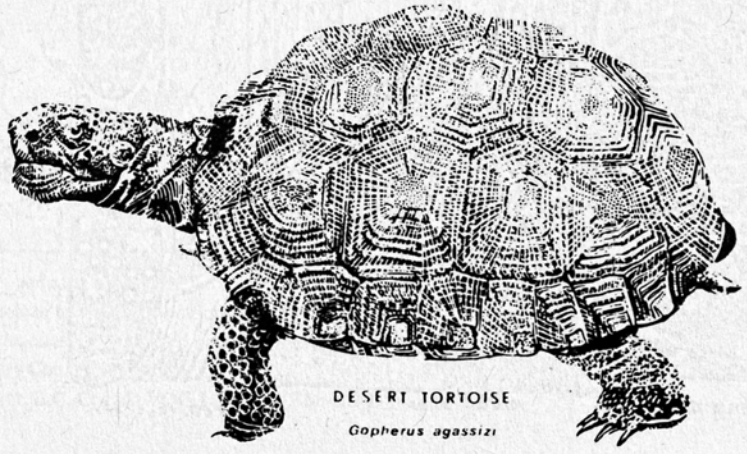


illustration by Chuck Ouray

LOGGING THREATENS FOWLER BROOK ON VERMONT'S GREEN MOUNTAIN NATIONAL FOREST

The current state of Vermont's forests results from a history of overcutting. By the early 1900s nearly every acre of Vermont had been cleared of its forests at one time or another for agriculture and wood products. Now, nearly a century later, 85% of Vermont is again covered with trees. Unfortunately we have not regained healthy forest ecosystems, yet. Our tree covered acres lack the structural complexity of a true forest. In time however, if left to the forces of Nature, Vermont's forests may regain their former diversity. Gradually, natural disturbances, like storms and disease, will create natural openings and structural complexity in our forests. This is already happening in many places.

The Forest Service justifies much of its logging as practices to prevent disease and storm damage—precisely the natural processes needed to return our forests to health. To make matters worse, the Forest Service justifies the rest of their logging as mimicking the natural disturbance that they have logged in order to prevent!

Contrary to Forest Service philosophy, a healthy forest is far different from a neat stand of trees. They are as different as a Bison is from a cow or a Gray Wolf is from a poodle. Far from sanitized stands of "thrifty young trees," a forest ecosystem *depends* on natural disease and disturbance. The magic of the forest is the interplay between life and death, the dynamic fluctuations of the dance of life.

A forest is not only fast growing board-foot-producing economically valuable timber. It is also the dead standing trees that are home and food sources for a myriad of insects, plants, fungi, amphibians, reptiles, birds and mammals. It is the fallen rotting logs, covered with mosses and mushrooms, holding down the soil as they return to soil, providing nitrogen for other trees and homes for Marten and Fisher, teeming with insects, forming pits and mounds for salamanders, blooming with wildflowers.

Clearcuts and other forms of logging that drag dead trees through streams and across the fragile soil out of the forest are no substitute for Nature's disturbances. The Forest Service often says trees are "a renewable resource."

Although it's true you can grow back trees, forests are not renewable resources—at least not in the time scale of a single human life. It has taken nearly a century for our forests to recover to the point where natural disturbances are returning.

The Fowler Brook area, just north of Wallingford Pond in White Rocks National Recreation Area of Green Mountain National Forest, is an example of the return of healthy Eastern forest ecosystems. Walking through Fowler Brook you will observe the return of the dance. You will see fallen logs covered with life. You will see claw marks on the aging American Beech where Black Bears have climbed for beech nuts. You will see a diverse understory of young growth, wildflowers, moss and ferns. You will see songbirds nesting in the leaves of the living trees and woodpeckers pecking holes in the standing dead ones. You will also see blue spray paint on the trees, where the Forest Service has marked their proposed timber sale. Preserve Appalachian Wilderness has held off the logging of Fowler Brook for two years through appeals because it is contrary to the Forest Plan and against the law.

Vermont's forest ecosystems can only recover if large contiguous blocks of forest are allowed to pursue their natural course. Making up only 2.5% of Vermont's timber base, the Green Mountain National Forest has a role far more important than supplying the public demand for wood products. As the Forest Plan states, "Private lands should easily be able to meet that demand."

The Green Mountain National Forest needs protection from logging and from a Forest Service that fails to recognize its value. Preserve Appalachian Wilderness needs your help to preserve Fowler Brook and other priceless forests of Vermont. Please send donations to PAW, 117 Main St. Brattleboro, VT 05301. Send letters to Senator Patrick Leahy, Russell Senate Office Bldg., Washington, D.C. 20510, urging the protection of Fowler Brook and other areas of the Green Mountain National Forest.

—Mathew Jacobson, PAW Projects Coordinator

MUDD WINS ONE FOR MUD

In a precedent setting move, the Environmental Protection Agency has settled a lawsuit with Biodiversity Legal Foundation (BLF) Staff Attorney Ned Mudd involving the state of Alabama's water quality program as it affects Threatened and Endangered (T&E) species.

The settlement requires EPA to initiate formal consultation, pursuant to Section 7 of the Endangered Species Act (ESA), with the US Fish & Wildlife Service (FWS) as to all water quality regulations adopted by Alabama during its 1991 Triennial Review process. A biological opinion, to be rendered by the Fish & Wildlife Service, ostensibly will illustrate any problems associated with various water quality regulations which may jeopardize the continued existence of T&E species in Alabama's waters.

The settlement is seen by environmentalists as a critical step in the right direction for Alabama—which ranks near the top among states for numbers of species on the ESA list. The new arrangement in Alabama between EPA and FWS may be extended to other states as well.

Mudd, who acted as plaintiff in the case, believes aquatic ecosystems nationwide suffer from sloppy implementation of the Clean Water Act nationwide. By bringing the Fish and Wildlife Service to the table, he expects cumulative and indirect impacts of Alabama's allowable discharges of pollutants to be scrutinized wherever T&E species are present. This could result in strengthening Alabama's water quality regulations.

Wild Earth will track this issue as it unfolds. BLF welcomes donations to support its defense of aquatic ecosystems.

—Reported by Biodiversity Legal Foundation, POB 18327, Boulder, CO 80308-8327.

Eastern Forest Recovery

by Dave Foreman

Editor's note: The following is from Dave's chapter, "The Big Woods and the Big Outside," in the forthcoming book CLEARCUT: The Travesty of Industrial Forestry, *edited by Bill Devall, to be published in fall 1993 by Earth Island Press with the assistance of the Foundation for Deep Ecology. The Foundation plans to use this powerful indictment of industrial forestry to awaken US and Canadian politicians and citizens to the plight of North America's forests. The book also includes chapters by Reed Noss, Herb Hammond, Chris Maser, Mitch Lansky, Ed Grumbine, Alan Drengson, as well as scores of shocking photographs of clearcuts from throughout North America.**

illustration by Trina Schimmoeller

In designing a major ecological recovery effort for forest areas east of the Great Plains, two types of areas must be considered. First, there are a few large blocks of forest already in federal or state ownership that form the logical core units for a biodiversity recovery system. These "Greater Ecosystems" in the East are Adirondack State Park in New York, the North Woods of northern Minnesota and the Upper Peninsula of Michigan (National Forests, state forests, and National Parks), the Southern Appalachians (Great Smoky Mountains National Park and surrounding National Forests), and the Florida Everglades. Smaller blocks of federal and state land with potential as wilderness recovery core areas are Baxter State Park in Maine, White Mountain NF in New Hampshire, state forests in north-central Pennsylvania, Shenandoah National Park and National Forests in the Central Appalachians of West Virginia and Virginia, and Okefenokee National Wildlife Refuge-Osceola National Forest in Georgia and Florida. National Forests and state lands in other Eastern states are key as smaller core areas and as biological corridors between the larger cores.

The second type of area to consider in developing a wilderness recovery network is private land suitable for public purchase and ecological restoration. While such public acquisition is necessary in forest areas throughout the East, three regions demand special attention. They are the transition forests of northern New England and New York, Southern Longleaf Pine forests, and Ohio Valley hardwood forests. In the first two, huge areas are owned by a few corporate interests.

Let us consider the existing public forests in the East. Past efforts by conservationists to establish National Forests in the East and, more recently, to protect them from destructive logging, offer precedents and instruction for a more visionary strategy. This should include complete protection for Eastern National Forests as the cores for continental wildland recovery, and public acquisition and restoration of large tracts of forest currently in private ownership.

* The Foundation seeks forest friends to help distribute the book. Forest activist groups are encouraged to present copies of CLEARCUT to members of Congress, officials of logging corporations, government officials, and to members of the media who will review CLEARCUT in their publications. CLEARCUT will be printed on post-consumer recycled paper and quite possibly on wood-free paper. For information on how you can help distribute the book, contact Save America's Forests, 4 Library Court, Washington, DC 20003; Rainforest Action Network, 450 Sansome St., San Francisco, CA 94133, (415)398-4404; The Valhalla Society, Box 225, New Denver, B.C. Canada VOG 1SO; (604)358-2333.

When National Forests were established in the West around the turn of the century, there were few public lands left in the East from which National Forests could be established (the upper Midwest was the principal exception). Nonetheless, conservationists, supported by Eastern members of Congress, recognized that National Forests should be created in the East. The 1910 Weeks Act authorized the purchase of private lands for National Forests. Most National Forests in the East, as well as most National Parks and National Wildlife Refuges there, are former private lands that have been purchased by federal and state governments, and by private groups. Thus, buying large tracts of private land for public conservation purposes is not unprecedented.

Although Eastern conservationists began to suggest possible Wilderness protection for National Forest areas east of the Rockies before the Wilderness Act was passed in 1964, the Forest Service argued that no areas qualified, that there was a fundamental difference between National Forest lands East and West (except for Minnesota's Boundary Waters). In the West, they argued, National Forests had been withdrawn from the public domain and, although some minor uses such as grazing, tie-hacking, old cabins, and such may have previously been made of Wilderness Areas there, those areas were essentially pristine. The Eastern National Forests, on the other hand, had been purchased from private owners and added to the system. They had been homesteaded, cleared, and developed at various times during their history. Even if, under Forest Service management, the forests were growing up, old roads were fading, signs of habitation were disappearing, and the appearance of wilderness was being reestablished, these areas were not wilderness in the same sense as the Western wilderness. There was a qualitative difference, the Forest Service insisted. To include Eastern areas in the Wilderness System would tarnish the whole system and demean the pristine Western areas.

There was an element of sincerity in the Forest Service argument. Some foresters honestly believed it. Others used it in a Machiavellian way to keep their managerial hands from being tied. Yes, under Forest Service protection these Eastern areas were recovering from past abuse, but that didn't mean the Forest Service had no plans to abuse them again as their trees became large enough to harvest.

Nevertheless, belying their own argument, the Forest Service had established three Wil-

illustration by Sandy Hogan

derness Areas (called "Wild Areas" because they were under 100,000 acres) in the East before the Wilderness Act. They were Linville Gorge and Shining Rock in North Carolina, and Great Gulf in New Hampshire.

Convinced that there was no other potential Wilderness in the East, the Forest Service's first Roadless Area Review and Evaluation (RARE), in 1972, covered only National Forests in the 12 Western states (with three exceptions—one each in Florida, North Carolina, and Puerto Rico). Eastern conservationists mobilized with the support of The Wilderness Society and submitted Wilderness proposals to Congress. An Eastern Wilderness bill was drafted; the Forest Service countered with a proposal for a separate, but lesser, system of Eastern National Forest "Wild Areas." After a substantial campaign, a bill was passed by Congress and signed by President Ford on January 3, 1975, establishing 16 full-fledged units of the National Wilderness Preservation System in Eastern National Forests and directing the Forest Service to study for possible Wilderness recommendation an additional 17 areas.

The dam had been broken. The Forest Service in the second Roadless Area Review and Evaluation (RARE II), in 1977-79, considered National Forests in the East equally with National Forests in the West. State-wide bills in the decade after RARE II have designated additional National Forest Wilderness Areas in most of the Eastern states with National Forests.

Two factors, unfortunately, work against Wilderness designation in Eastern National Forests. First, the land use history of these recovered Wildernesses limits their size. Only a handful of National Forest roadless areas in the East exceed 100,000 acres in size; most total under 25,000 acres. The lands that have recovered are small and isolated. It will require conscious planning to restore areas of several hundred thousand acres in the East to a general condition of roadlessness and continuous forest cover. This is the first prerequisite for reestablishing ecological Wilderness with the full range of native species.

Second, Forest Service managers have the same bulldozer and chainsaw mind-set in the East as they have in the West. Their job is to build roads and cut trees, not to restore and protect ecosystems, or so they believe. Areas in the Eastern National Forests that have recovered a degree of wildness are under the same threat of clearcutting and roading as are larger areas in the West. Even though Eastern National Forests are the logical cores for wilderness restoration, this will not be achieved with the support of the Forest Service, but by overpowering them in the same way conservationists overpowered them in 1974 on the Eastern Wilderness Act. It will be a far more difficult campaign.

The designated Wilderness Areas on the White Mountain National Forest, for example, were not easy to win. The 1984 New Hampshire Wilderness Act was the worst one in the East. Of 262,257 acres in RARE II (conservationists proposed 495,596 acres for Wilderness and that figure is a far more accurate indicator of what was roadless), only 77,000 acres were protected in the bill. Taking a page from Wilderness bills in the West, most of the protected acreage was in the higher elevations of the White Mountains, leaving the ecologically more important lower-elevation forests open to increased logging.

The Green Mountain NF in Vermont has done as well as any Eastern National Forest in terms of Wilderness designation, but the Forest Service plans clearcutting in key unprotected wildlands vital for linking existing Wilderness Areas into larger old-growth recovery areas. Fortunately, Preserve Appalachian Wilderness (PAW) has recently stopped most planned timber sales on the GMNF, as well as many on other Eastern Forests.

The largest block of forest in Pennsylvania is on state forests in the north-central part of the state. Closure of minor roads and prohibition of logging around the Hammersley Wild Area could create a quarter-million acre core Wilderness Recovery Area that would serve as a vital link between the Adirondacks of New York and the Central and Southern Appalachians to the south. This area could also help link the Adirondacks to the Ohio Valley recovery areas.

The Eastern Wilderness Act in 1974 and subsequent Wilderness legislation was too late to give us big wilderness in the National Forests of the South. Nonetheless, conservationists propose visionary wilderness recovery plans for the Jefferson, Washington, and Monongahela National Forests in the Central Appalachians of Virginia and West Virginia. Virginians for Wilderness has set a powerful precedent for conservation groups by convincing the George Washington NF to include a wilderness recovery alternative in the forest plan.

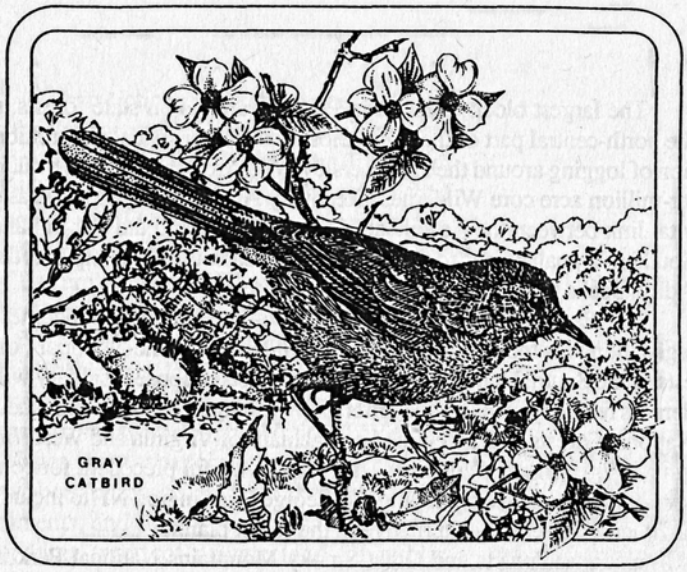
National Forests and Great Smoky Mountains National Park in the Southern Appalachians form the largest block of federal land east of the Mississippi—four million acres. This is the core for a major forested Wilderness Recovery Area that could support the whole array of native species, including wolf, Eastern Panther, and Elk. Not surprisingly, the Forest Service has launched a blitzkrieg of logging and roadbuilding in these National Forests to make up for decreasing timber extraction in Washington, Oregon, and northern California.

Farther south is the most devastated major American forest type—the Longleaf Pine-Wiregrass landscape. Once covering 60 to 70 million acres of the Southeastern Coastal Plain from the Carolinas to the Mississippi River, less than 5 million acres remain, mostly in small, degraded patches. No more than 2 percent of the original Longleaf Pine communities are in reasonably healthy condition. Fire control, logging, and conversion to pine plantations have virtually destroyed this ecosystem and threaten species dependent on it, like Florida Panther, Black Bear, Gopher Tortoise, Indigo Snake, Sherman's Fox Squirrel, and Red-cockaded Woodpecker. The National Forests in Florida are key parts of a visionary core wilderness/biological corridor recovery plan for that state, already developed by conservation biologists Reed Noss and Larry Harris. Despite the growing support within Florida for this landmark plan, the Forest Service remains stridently opposed and goes on cutting and roading the rare Longleaf Pine forests under their stewardship. A similar situation exists on lowland National Forests in the Carolinas, Georgia, Mississippi, and Alabama. Conservationists need to stop all logging on the National Forests with Longleaf Pine.

In the National Forests of east Texas, local Forest Service officials vie for "worst in the nation" status by conducting "non-commercial" logging operations in *designated Wilderness Areas*. This led Texas conservationist Ned Fritz to launch the National Forest reform effort, Forest Reform Network, to outlaw clearcutting.

In the Ohio Valley hardwood forests (including Wayne NF in Ohio, Hoosier NF in Indiana, and Shawnee NF in Illinois), conservationists, led by a new coalition called Heartwood, are campaigning hard to halt all logging on the federal and state forests. The National Forests and nearby state forests should be core areas for wilderness recovery in the Ohio Valley.

Opportunities abound for wilderness recovery in the North Woods of Wisconsin, Minnesota, and Michigan on National Forests, National Parks, and state forests. Although the largest Wilderness Area in Wisconsin today is less than 20,000 acres, on the Nicolet National Forest, by closing roads, by stilling the chainsaws, by encouraging Timber Wolf



and Moose, ecological wilderness could come back. Botanists at the University of Wisconsin have proposed two biodiversity preserves (100,000 acres and 40,000 acres) on the Chequamegon National Forest where native old-growth ecosystems could be reestablished. To his lasting credit, the Forest Supervisor supported the idea, but the Regional Forester overruled him. The botanists have sued in federal court over the rejection of their visionary proposal. More power to them.

In the Upper Peninsula of Michigan, where Nick Adams and his kid sister fished the Big Two Hearted River . . . well, Paul Bunyan got that, too. But he missed a couple of places on the UP, places that offer a glimpse of what Michigan once was. These areas of National Forest and state forest offer cores for ambitious wilderness recovery areas of a quarter million acres and more.

The Superior National Forest of northeastern Minnesota, nearby Voyageurs National Park, and state forest in the peatlands of north-central Minnesota create a block of five million acres of public land that could be combined with a similar block of five million acres in adjacent Ontario for one of the largest temperate forest reserves in the world. Although logging is proceeding apace in much of this region, the Minnesota North Woods probably hold the largest block of virgin forest in North America east of the Rockies and south of the Boreal Forest.

It is not enough, however, to restore natural forests on land already owned by the federal and state governments. Some of the wildest and most important forest areas in the East are owned by large timber and paper companies. A national crusade is needed to demand the purchase and subsequent protection of these lands by federal and state governments. The three major areas demanding large public acquisitions are the Northeast, Southeast Coastal Plain, and Ohio Valley.

Surprisingly, much of New England is wilder today than it was 100 years ago or even 150 years ago. Fields marked by stone walls have grown up into forest again; there are rumors of Catamounts. Abandoned dirt roads in the mountains are fading.

Nowhere else in the United States are the opportunities for sweeping wilderness restoration greater than in northern New York, Vermont, New Hampshire, and Maine. The land is more resilient here than in the arid West, and the pressures for development have not been so strong until recently. With the wisdom and foresight that established Adirondack Park 100 years ago, wilderness recovery areas of millions of acres could be put together in the Northeast today from privately-owned timber lands. Paper companies own a vast, once-logged but otherwise undeveloped area near the Canadian border in Maine, New Hampshire, and Vermont, which consists of northeastern spruce/fir and northern hardwoods forest, streams, lakes, and mountains.

Indeed, some *10 million* acres in Maine have no year-round human residents, according to wilderness expert and author George Wuerthner. This is the largest uninhabited area in the Lower 48. The "Northeast Kingdom" of Vermont, mostly paper company land, is the wildest and least populated part of that state. Much of northern New Hampshire (in private ownership) is probably as wild as the large roadless areas in the White Mountain National Forest. Similarly, huge areas in Adirondack State Park in New York are owned by paper companies. These areas have been logged, and some dirt roads scar them, but the opportunity to restore significant wilderness is greater in northern New England and New York than anywhere else in the United States. If these areas were transferred to public ownership, and closed to logging and motorized vehicles, the forests would develop old-growth characteristics in a century. Wilderness-dependent species such as Wolverine, Panther, Lynx, Pine Marten, and Caribou would likely return even sooner. The Fisher has already repatriated these parts.

The opportunity for such restoration will never be better than it is today. The going price for timber company land is $200 per acre or less; all of northern Maine (10 million acres) could be purchased for under $2 billion—the price of two Stealth bombers. More than enough money is currently in the federal government's Land & Water Conservation Fund to buy several million acres in northern New England for wilderness restoration and a new National Park(s). All that is lacking is enough popular demand to force the necessary political will.

Now is the time for conservationists in northern and the nation to envision real wilderness, with its full complement of native species. The opportunity currently exists for wilderness on an Alaskan scale in northern New England and New York.

If conservationists do not act swiftly, however, the opportunity will be lost. Forestry is becoming harsher on corporate lands. Herbicides, larger clearcuts, shorter rotation times, more roads, and heavier machinery are having a more devastating impact than the "lighter" logging practices of the past. Relatively natural forests are being transformed into industrial tree farms. Moreover, developers like the Patten Corporation are gobbling up paper company lands that are put on the market. If this continues, condominiums, ski areas, lodges, vacation resorts, and second homes will ring the lakes and scar the mountains; loon and wolf will lose out once again.

As big timber companies cut the last old-growth forests on the Pacific coast, they are moving their principal operations to the pine forests of the Southeast, where they hope to harvest trees like corn in planted fields. Just as in New England, it is important to identify privately-owned forest tracts in the Southeast as priorities for public acquisition for old-growth recovery areas. The rapid transformation of the Southeastern forest into artificial pine plantations makes that task urgent.

Ecologists are also examining the remnant mixed-deciduous forests of the Ohio Valley to identify prime old-growth forest recovery areas and to set priorities for public acquisition of key private forest tracts that could expand and connect existing state lands and National Forests in Ohio, Indiana, and Illinois. ❦

Dave Foreman, Executive Editor of Wild Earth *and Chairman of The Wildlands Project, has been at the forefront of Wilderness advocacy in the US for over 20 years.*

Gray Catbird (Dumetella carolinensis) by Brian Evans

Forest Service Sabotages Clinton Directive to End Logging Subsidies

by Mat Jacobson

On 29 April 1993, the Forest Service announced a proposal to end commercial logging on over a third of all National Forests, affecting more than 60 million acres. This proposal, if enacted, would be a major step toward the preservation and restoration of forest ecosystems in the US. Unfortunately, the Forest Service has done their best to generate opposition to their own proposal.

This proposal is a part of the Clinton administration's second attempt to end taxpayer subsidies of environmental destruction on public lands. In February, President Clinton and Secretary of the Interior Bruce Babbitt announced plans to end subsidies on logging, mining and cattle grazing on public lands. This earlier proposal, part of Clinton's economic package, was to save taxpayers four billion dollars over the next four years. Environmentalists lauded the plan; but cattle ranchers, timber and mining executives, and western Senators and Representatives, afraid of having their pork supply cut off, squealed loudly. Two months later, Clinton dropped the proposal from his package. Critics attacked Clinton for being bullied into reversing an environmentally sound proposal. *Time* magazine went so far as to say Clinton was making Bush's environmental record look good.

Clinton and Babbitt responded by saying that they were not giving up on the plan. They just felt there was a better place for it than in the economic package. The Clinton administration didn't even need Congress's approval—they could end subsidies through an executive order.

Putting a rabid dog into the hen house, Clinton issued a directive to F. Dale Robertson, Chief of the Forest Service, to come up with a proposal to phase out below cost timber sales over the next four years. All that Clinton would need to do would be to sign the proposal upon completion, and it would be enacted without Congressional approval.

As reported by the New York Times, in response to Clinton's directive, Robertson and Associate Chief George Leonard unveiled a proposal late last month, not to end below cost timber sales, but to end all commercial logging on National Forests with below cost timber programs by the end of 1997. The proposal would affect 62 National Forests.(See sidebar.)

Sound too good to be true? Of course it is. Have the men who presided over one of the most corrupt and environmentally destructive agencies in US history suddenly changed course in order to save their jobs under a new administration? No; they are trying to boondoggle the President like they've been boondoggling environmentalists for years.

Both the Forest Service and the timber industry know that the mainstream public—the silent majority—does not support logging, of any sort, on National Forests. In fact, most are unaware that it is going on at all...

Anti-environmental administrators like Robertson and Leonard have learned a lot from the failure of their comrade James Watt. Watt, whose anti-environmental policies were right in line with his Republican bosses, failed because he presented his proposals in a blatant, forceful manner that was unpalatable to the American public. Well, what if the Forest Service used this approach to their advantage, presenting a pro-environment package in a way that would generate the loudest outcry? Someone, Mark Twain probably, once said, "The best lie is the truth told unconvincingly." It seems the best way for an agency to get what they want when the tides turn against them is to pretend they're proposing what they don't want, and do so in a way that will generate backlash.

In an effort to sabotage Clinton, Robertson and Leonard drew up the most drastic and immediate proposal they could come up with (an environmentalist wish list), and released it to timber industry executives and Forest Supervisors before submitting it to the White House.

Like an environmental group spreading fear to raise money, Robertson and Leonard have sounded the alarm: Everything you love is about to vanish from the Earth! Wake Up! Take Action! In the past few weeks, as planned, well-organized opposition to the proposal has arisen throughout the country.

Immediately after release of the proposal, in an unprecedented public display of dissention, Forest Supervisors across the nation came out in the media opposing their boss's proposal. This may be the first time in history that local Forest Supervisors have voiced opposition to a top level agency proposal. Either this marks a long awaited period of openness within the agency, where Supervisors are finally allowed to speak their own opinions without facing retribution, or they have been told by the agency what their opinions are. Judging from the widespread and immediate response, it is the latter.

The proposal is sound. There is absolutely no excuse for subsidizing environmental degradation. Before the government can expect people to make sacrifices for the environment, it must stop paying timber companies to plunder our public lands. If the proposal were only to stop individual below cost timber sales, the Forest Service would just play around with their computer programs, change a few variables in their accounting systems, call a few more clearcuts "Game Species Habitat Improvement Cuts," and the strictly timber part of their timber sales would no longer be "below-cost." Eliminating commercial logging on entire National Forests is necessary given the double-talk, misdirection, and demonstrated corruption of the agency.

Both the Forest Service and the timber industry know that the mainstream public—the silent majority—does not support logging, of any sort, on National Forests. In fact, most are unaware that it is going on at all, believing industry and Forest Service propaganda that National Forests are healthy forests protected by Smokey the Bear. To seize control of the issue, Robertson gathered his forces to flood the media with opposition. Like a vaudeville ventriloquist, he has staged a theatrical argument with himself, with the Forest Supervisors playing wooden dummies. And he hopes they win. Unfortunately, the ploy seems to be working. Representatives, Senators, and middle of the road environmental groups afraid of losing long fought for alliances with industry, have come out against this "heavy handed top down bureaucratic proposal."

What the conservation community needs to do is make the voices of the silent majority heard by Congress and the President. A "heavy handed top down bureaucratic proposal" is necessary when an agency has proven time and again that it will take every opportunity to act in bad faith with the public interest. It's hard for me to say this, but we need to write letters. We need to write to everyone we know and everyone on our mailing list and ask them to write letters. We need to use every creative means we can come up with to demonstrate support for the proposal. It is of the utmost importance that this happen soon, before the administration and Congress act on this well-staged voicing of the minority view.

IT AIN'T OVER TILL IT'S OVER

The conservation community and the American public at large may voice their support of the proposal for "No commercial logging on money losing National Forests." Robertson's strategy may backfire and the proposal be signed by Clinton and put into effect. Would the 62 affected National Forests be saved? Would environmentalists like me finally be put out of work. Unfortunately not. While enactment of the proposal would be a *major* victory for the environment and a great step toward the preservation and restoration of American wildlands, it would not be a complete victory

The Forest Service likes to cut trees. They feel a need to cut trees. There is a Pavlovian urge to cut whenever a tree is sighted. As those of us in this business have learned, any question you ask the Forest Service, the answer is "Cut down trees!" The Forest Service doesn't just cut down trees for "commercial timber sales." They cut down trees on the only undisturbed forest in a region to make habitat for species that thrive on disturbance. They cut down trees to provide a prey base for species that require deep woods habitat. (A "biologist" for the White Mountain National Forest in New Hampshire said recently that if Mountain Lion were proven to exist on the Forest he would increase clearcutting so they'd have more rabbits to eat.) They cut down trees for scenic vistas. They cut down trees for parking lots. They cut down trees for stargazing. They cut down trees for hang gliding takeoff sites. They cut down trees. It's what they do.

On most eastern National Forests, the Forest Service has already stopped calling most of their timber sales "timber sales." Now they're called "wildlife habitat improvements," "capital investments," and "vegetative manipulations to reach a desired future condition." If this proposal goes through, they will move all timber sales into these categories.

This is not to make light of the beneficial consequences of the proposal. The goal posts would be moved within our reach, but the game would be far from over.

The first problem we would face is going-out-of-business sales on the 62 Forests. The Forest Service would do their damnedest to cut as many trees as possible before the gate closes. Grass roots activists would have to redouble their efforts to keep trees standing on

Where Commercial Logging Would End

1994
Custer National Forest, MT
Beaverhead National Forest, MT
Bitterroot National Forest, MT
Gallatin National Forest, MT
Deerlodge National Forest, MT
Arapaho-Roosevelt National Forest, CO
Lincoln National Forest, NM
Gila National Forest, NM
Manti LaSal National Forest, UT
Sawtooth National Forest, ID
Challis National Forest, ID
San Bernardino National Forest, CA
Shawnee National Forest, IL
Green Mountain National Forest, VT
Chugach National Forest, AK

1995
Helena National Forest, MT
Lewis and Clark National Forest, MT
Pike-San Isabel National Forest, CO
Routt National Forest, CO
Bighorn National Forest, WY
Prescott National Forest, AZ
Santa Fe National Forest, NM
Carson National Forest, NM
Bridger-Teton National Forest, WY
Toiyabe National Forest, NV
Ashley National Forest, UT
Wasatch-Cache National Forest, UT
Jefferson National Forest, VA
George Washington National Forest, VA
Wayne-Hoosier National Forest, IN

1996
Flathead National Forest, MT
Shoshone National Forest, WY
Medicine Bow National Forest, WY
Grand Mesa National Forest, CO
Uncompahgre National Forest, CO
Gunnison National Forest, CO
White River National Forest, CO
Cibola National Forest, NM
Kaibab National Forest, AZ
Dixie National Forest, UT
Croatan National Forest, NC
Uwharrie National Forest, NC
Nantahala National Forest, NC
Cherokee National Forest, NC
Pisgah National Forest, NC
Daniel Boone National Forest, KY
Cherokee National Forest, TN
White Mountain National Forest, NH
Chequamegon National Forest, WI
Hiawatha National Forest, WI
Superior National Forest, MN

1997
Nez Perce National Forest, ID
Targhee National Forest, ID
San Juan National Forest, CO
Rio Grande National Forest, CO
Tonto National Forest, AZ
Fishlake National Forest, UT
Uinta National Forest, UT
Caribou National Forest, WY
Wallowa-Whitman National Forest, OR
Ottawa National Forest, WI
Nicolet National Forest, WI
Huron-Manistee National Forest, MI
Chippewa National Forest, MN

their forests until the proposal takes effect.

Then the other justifications would kick in. We will have to be diligent, and we will have to do our homework, researching requirements of species and communities and presenting credible proactive proposals for their preservation and restoration. The establishment of these National Forests as core areas in accordance with wildland proposals would become more likely, but not easy.

In addition to the above mentioned justifications for timber cutting, we can expect the Forest Service to turn much of its energy toward the rampant exploitation of National Forests for recreational use. Forest Service officials see this as their best opportunity to keep funds flowing into their coffers. Wildland advocates must be ready with restoration proposals—proposals for stream rehabilitation, sediment fixing, erosion control, road obliteration and revegetation, habitat mapping and inventory, and other labor intensive ecosystem restoration work. If we are prepared we might even convince the Forest Service that our proposals are in their best interest. It takes at least as many employees to rip up a road, then recontour and revegetate the site, as it does to build a road.

Once we've convinced them, and established our National Forests as core areas, we'll face increased pressure to get the cut out on private lands. Perhaps we can persuade the Forest Service to employ their knowledge of multiple-use management to help develop and advocate sensible buffer zone management on lands surrounding the cores.

Fortuitously, this proposal would take effect at about the same time as the new Forest Plan process. If we prepare our proposals and lobby hard, we just might get what we have been fighting for—the sensible ecological management of our public lands. The primary directive for the management of National Forests must be the preservation and restoration of native biological diversity, to the exclusion of all conflicting uses. The goal is in sight. Let's get ready to kick the ball in. Then we can relax and share a few beers.

Mat Jacobson is Programs Coordinator of Preserve Appalachian Wilderness Network, 117 Main St. Brattleboro, VT 05301.

Reactions to "Forest Service Sabotages..."

Editor's note: We sent Mat's articles on the FS proposal to two experts on Forest Service issues. They basically agreed with his analysis, and also offered these thoughts:

What has not been widely reported is that the cut will actually go up in the Southwest and Northern Rockies. Two out of eleven National Forests in AZ and NM will see vastly increased logging because they have traditionally been money makers—Coconino and Apache-Sitgreaves, on AZ's Mogollon Rim where the forests have already been creamed and very little old growth remains.

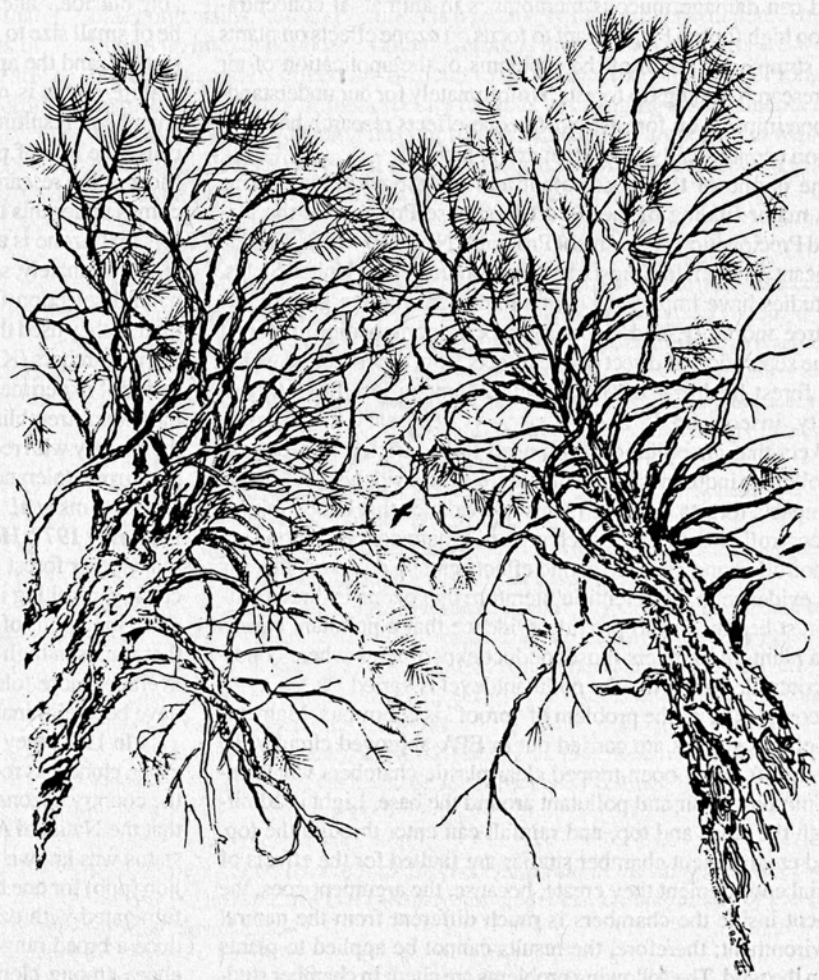
Keith Schneider of New York Times was leaked the below cost forest memo by a timber beast on Gila National Forest. Since Keith loves cowboys and is down on enviros, this FS official saw an opportunity for good media spin. This timber beast was clearly trying to protect his job.

Writing Congress to support the phase out is necessary—Clinton will be inclined to remain firm if Congress is sharply divided on the issue. Letters of support to Clinton/Gore are also important.

—Sam Hitt, Forest Guardians, 612 Old Santa Fe Trail, Suite B, Santa Fe, NM 87501.

The entire below-cost sale issue diverts attention away from one simple truth: National Forests represent our only chance to maintain native biodiversity and relatively intact forest ecosystems in temperate North America. And that chance is slipping away with the rampant destruction now occurring.

—Howie Wolke, Bitterroot Valley, MT



Ant's-Eye-View of Ponderosa Pines by R. Waldmire

Is Ozone Affecting our Forests?

by Robert Eckert

We hear the word "ozone" often these days. In terms of the biosphere, it has its place, in a fragile layer in the stratosphere, where it reflects ultraviolet radiation (*uv*) back into space, protecting plants and animals against mutations and generation of dangerous free-radicals that would be caused by high energy *uv* bombardment. However, in the lower troposphere, ozone disrupts photosynthesis in plants and can damage mucous membranes in animals if concentrations are too high for too long. I want to focus on ozone effects on plants here, and summarize some of the problems of the application of air pollution research findings to forests. Unfortunately for our understanding of ozone impacts on forests, most ozone-effects research has concentrated on economically-important crop plants.

Ozone is one of the most potent and widespread plant toxins known. A major finding of the Forest Response Program of the National Acid Precipitation Assessment Program (NAPAP) was that ozone is a significant problem for forest trees across much of the United States. Several studies have implicated ozone in decreasing tree growth, increasing tree mortality, and changing species composition in forest stands. The separation of direct ozone effects from other factors which influence forest health—such as drought, competition, low nutrient availability, insect attack, and disease—is necessary to convince policymakers that air pollution laws need to be stricter. Representatives of polluting industries argue that there is no evidence that ozone directly impacts forests. Despite reams of evidence that ozone injures plants in controlled-environment chambers, where concentrations are closely controlled and specific ozone effects can be detected, there is very little evidence in the scientific literature that ozone is directly affecting forest health. But to provide evidence that a pollutant causes injury to a plant, researchers must conduct experiments where conditions are controlled and only the pollutant level is varied.

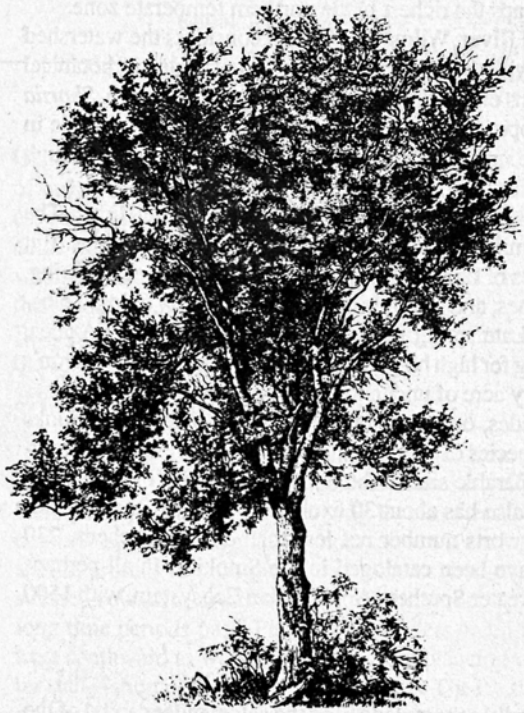
The complexity of the problem of "proof" is enormous. Many air pollution-effects studies are carried out in EPA-approved circular, 10 ft. diameter, 8 ft. high, open-topped clear plastic chambers which introduce a mixture of air and pollutant around the base. Light is admitted through the sides and top, and rainfall can enter through the top. Controlled environment chamber studies are faulted for the effects of the artificial environment they create, because, the argument goes, the environment inside the chambers is much different from the natural forest environment; therefore, the results cannot be applied to plants growing in the wild. The following problems are cited: In chamber studies, plants are often grown in pots in an artificial soil mix, properly fertilized and watered for optimum growth, a situation much different from the wild where plants are often water-stressed and competing with their neighbors for limited nutrients. Air movement in chambers is usually increased in order to disperse the pollutant evenly, with the side effect that boundary layers at the leaf surface are different from the "big outside," altering pollutant uptake through stomates. Plants must be of small size to fit into the chambers, so young plants are most often studied, and the applicability of results obtained from young plants to mature plants is questionable. Temperatures are often higher inside chambers, resulting in possible enhancement of pollutant uptake because the rate of plant metabolism is increased. And the list goes on. Most of the research evidence so far is based on chamber studies, and comes under this type of criticism when one tries to convince regulators that ozone is affecting forest health.

Fortunately, some studies were designed to test the hypothesis that natural selection for ozone tolerance has occurred in the wild, even though they used the controlled-environment chambers. Forward-thinking researchers (Karnosky *et al.* 1992; Berrang *et al.* 1991) designed a series of experiments using many clones created from root cuttings of individual trembling aspen trees which were collected from areas of the country with recorded high and low levels of ozone. It is well known that ozone tolerance is genetically controlled in a number of tree species (Adams *et al.* 1988; Kress *et al.* 1982; Karnosky and Steiner 1981; Karnosky 1977; Houston and Stairs 1973). Karnosky and Berrang (and many other forest geneticists) hypothesize that natural selection is occurring, resulting in loss of ozone-sensitive trees from forest stands located in regions of high ozone. Karnosky and Berrang expected to find that stands in high ozone areas would contain trees which were, on the average, more tolerant to ozone, since sensitive trees would already have been eliminated through natural selection.

In 1986. they collected and propagated seven to fifteen trembling aspen clones (as rooted cuttings) from each of 15 National Parks around the country. Ozone monitors were located in or near these locations so that the National Ambient Air Quality Standard (NAAQS) attainment status was known for each. Ozone levels exceeding 120 parts per billion (ppb) for one hour are considered non-attainment. The clones were fumigated with ozone following a specific protocol designed to produce a broad range of injury on foliage. Results showed large differences among clones in response to ozone fumigation. Clones from

Glacier National Park, one of the most pristine locations, were injured almost twice as severely as clones from Indiana Dunes National Lakeshore and Cuyahoga Valley National Recreation Area, both non-attainment areas for ozone. The results were highly significant in a statistical sense. For the other parks, injury to leaves was consistent with the expectation that less injury occurs in populations living in more polluted locations. These results indicate a high likelihood that ozone is acting either directly or indirectly to select against ozone-sensitive individuals of trembling aspen. These results contain the "proof" that ought to satisfy rational beings.

Ozone effects in forest stands are complex and likely indirect. The levels of ozone used in the experiment or observed in the parks are probably not high enough to kill even the most sensitive clones tested, but were high enough to reduce growth rates and possibly reduce reproductive capacity by interfering with pollen germination. In the more ozone-polluted locations, natural competition coupled with reduced growth rates, and reduced reproduction of sensitive trees, can result in altered genetic diversity of forest stands. It has been shown for pasture crops (*e.g.,* Bennett and Runeckles 1977) that ozone changes species composition under conditions of competition. Often genetic differences among trees are not expressed until the trees come under stress due to competition or other factors.



Populus tremuloides

The results of Karnosky and Berrang's investigations present a disturbing picture of loss of ozone-sensitive genotypes from our forests. What are the long-term effects of genetic loss on forests? We do not know, but classic experiments based on organisms with short lifespans (such as fruit flies) have taught us that loss of genes can be very detrimental for species that are cross-pollinating, which most trees are. Cross-pollinators (also called "outcrossers") usually carry harmful genes that are "hidden" by gene-dominance effects and other interactions among genes within an individual. When populations are reduced in size so much that breeding among related individuals increases, the harmful genes are expressed more often, resulting in loss of population fitness and decline of the species. The direct effect of the loss of the genes of ozone-sensitive individuals which never reach reproductive age is unknown. Some of these genes may provide an advantage under certain special situations (such as the stress induced by climate change or disease outbreaks). Loss of these advantageous genes would reduce the ability of the population, and ultimately the species, to adapt to environmental change.

The obvious remedy to this problem is to reduce emission of air pollutants at their sources (a big source is car exhaust). There is enough evidence in the scientific literature to convince any rational person that air pollutants reduce photosynthesis rates and plant growth, and that within-species genetic variation in response to air pollutants is great enough that natural selection can act. I believe that North America has already lost some trees to air pollution, but that we are still in the early stages of gene loss, because the life spans of trees are longer than those of most other organisms, and air pollution is a relatively recent phenomenon. Air pollution knows no human boundaries and therefore is present in wilderness areas as well as our back yards. Its effects are difficult to detect, but the potential for long-term reduction in the ability of plant species to adapt to changing environments is serious. We should resist any notion that our forests can adapt to air pollution without negative effects, just as we would resist the notion that humans can adapt to breathing air pollution without negative effects.

LITERATURE CITED:

Adams, M.B., J.M. Kelly, and N.T. Edwards. 1988. Growth of *Pinus taeda* L. seedlings varies with family and ozone exposure level. Water, Air, and Soil Pollution 38:137-150.

Bennett, J.P., and V.C. Runeckles. 1977. Effects of low levels of ozone on plant competition. Journal of Applied Ecology 14: 877-880.

Berrang, P., D.F. Karnosky, and J.P. Bennett. 1991. Natural selection for ozone tolerance in *Populus tremuloides*: An evaluation of nationwide trends. Canadian Journal of Forest Research 21:1091-1097.

Houston, D.B. and G.R. Stairs. 1973. Genetic selection of sulfur dioxide and ozone tolerance in eastern white pine. Forest Science 19: 267-271.

Karnosky, D.F. 1977. Evidence for genetic control of response to sulfur dioxide and ozone in *Populus tremuloides*. Canadian Journal of Forest Research 7: 437-440.

_____ and K.C. Steiner. 1981. Provenance and family variation in response of *Fraxinus americana* and *F. pennsylvanica* to ozone and sulfur dioxide. Phytopathology 71: 804-807.

_____, Z.E. Gagnon, and D.D. Reed. 1992. Growth and biomass allocation of symptomatic and asymptomatic *Populus tremuloides* clones in response to seasonal ozone exposures. Canadian Journal of Forest Research 22: 1785-1788.

Kress, L.W., J.M. Skelly, and K.H. Hinkelmann. 1982. Relative sensitivities of 18 full-sib families of *Pinus taeda* to O3. Canadian Journal of Forest Research 12: 203-209.

Robert Eckert tries to hide from air pollution in the Isinglass River watershed in New Hampshire. He is a conservation geneticist on the faculty of the University of New Hampshire.

The Southern Appalachians

Plant Paradise...Imperiled

by Robert Leverett

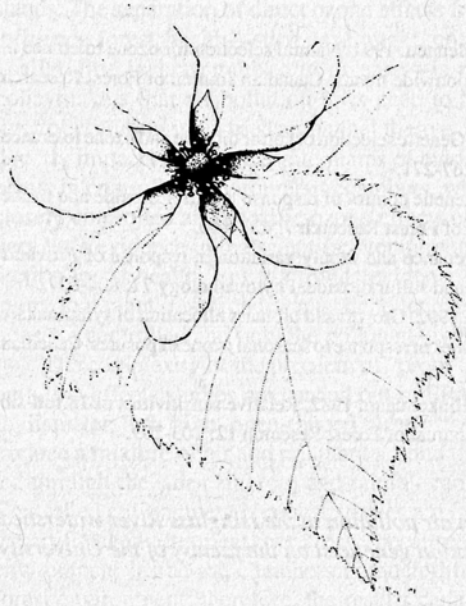
CRADLE OF VEGETATIONAL DIVERSITY

Mountain people tend to be intensely proud of their highland heritage. Having been raised in the Southern Appalachians, I count myself among this group. However, my pride doesn't stem from cultural ties. To be sure, I have those, but the heavy hand of human occupation has been far more destructive than benign in the region. Although I relish bluegrass music and sourwood honey, and in my younger days was suspected of taking a nip or two from my father's moonshine stock, I believe the greatest treasures offered by the Southern highlands have little to do with early mountain culture, colorful though it was—much less its modern commercialized counterpart. The Southern Appalachians offer remarkable botanical diversity—perhaps the richest in the northern temperate zone.

In her book on the French Broad River, Wilma Dykemann considers the watershed of that brooding river to be "probably the richest area in the United States in botanical treasures." As an example, she mentions one of the rarest wild flowers in America, *Shortia galacifolia*. Her example is but an appetizer. The magnitude of the vegetation's role in the Southern Appalachians cannot be understood without statistics, wearisome though they may be.

I'll begin with the Great Smoky Mountains, western arm of the Blue Ridge. The Smokies cover a modest 800 square miles in an equally modest length of 72 miles. But that acreage supports over 1300 species of flowering plants. Bursting forth in early spring, Phacelia, trillium, Dutchman's Breeches, and a couple dozen other brightly colored blossoms carpet the ancient forest floor. Late spring finds Mountain Laurel, Flame Azalea, and Catawba Rhododendron competing for high honors. By July, Rosebay Rhododendron's splashes of creamy whites adorn every acre of understory.

As the floral extravaganza subsides, our attention can shift to the towering trunks and spreading crowns of 102 native species of trees that present themselves in near tropical luxuriance. No other area of comparable size in the temperate regions of the United States surpasses this total. (The Park also has about 30 exotic tree species—not a blessing.) Beyond trees, mosses and liverworts number not less than 350 and lichens, 230 species. Over 2000 types of fungi have been cataloged in the Smokies. In all perhaps 2500 species of plants populate the Greater Southern Appalachian Ecosystem, with 1500 being of the flowering variety.

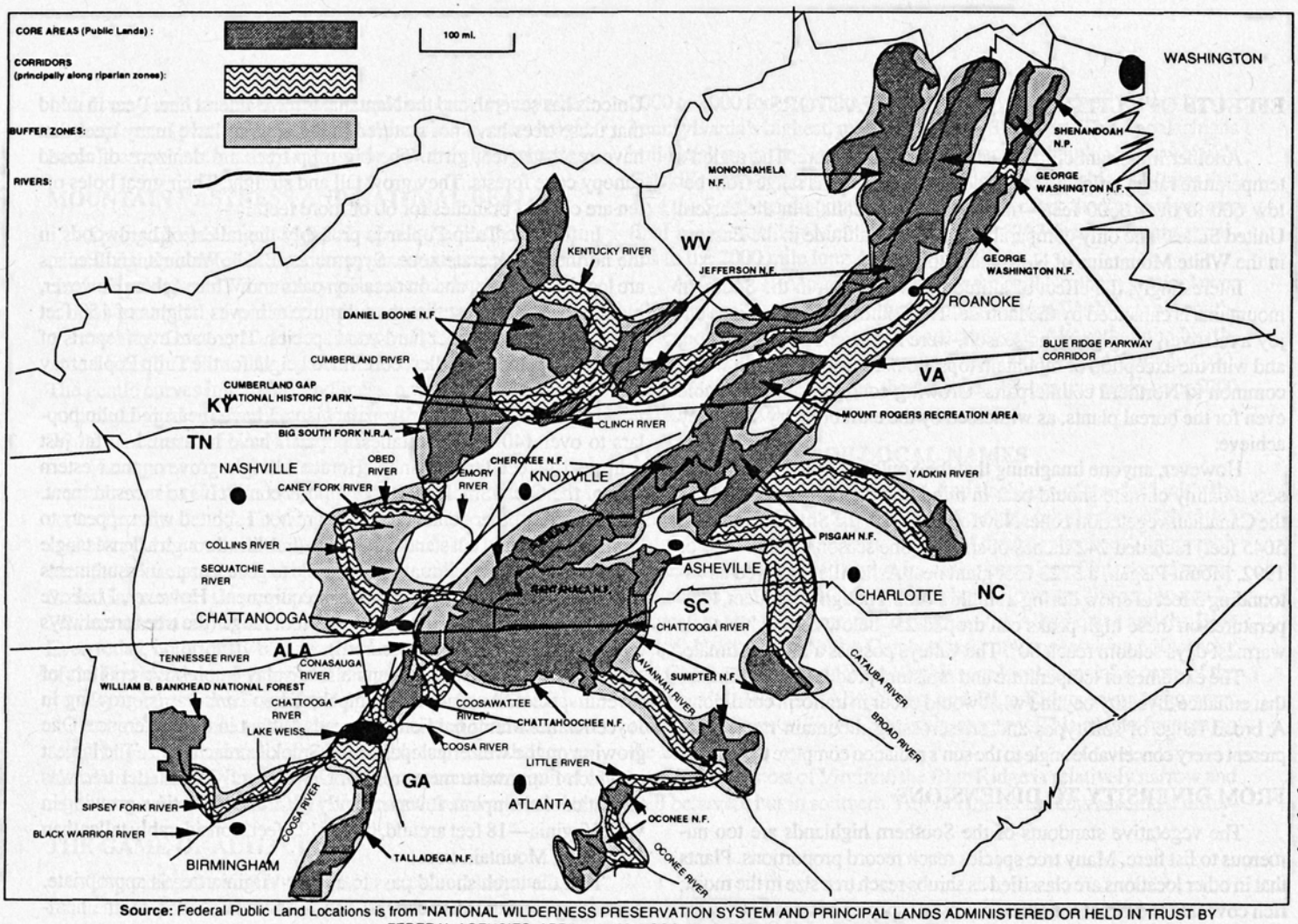


Blackberry Flower by Douglas Moore

FAUNA

The Smoky Mountains are generally acknowledged as the salamander capital of the nation. Arthur Stupka's Great Smoky Mountains National Park, published in 1960, mentions that 27 species occur within the Park boundaries. A later list provided by the National Park Service specifically names 26. The notorious Hellbender (North American

Proposed System of Linked Core Areas, Corridors, and Buffer Zones In the Southern Appalachian Bioregion*



map by Hugh Irwin

Source: Federal Public Land Locations is from "NATIONAL WILDERNESS PRESERVATION SYSTEM AND PRINCIPAL LANDS ADMINISTERED OR HELD IN TRUST BY FEDERAL AGENCIES: APRIL 1, 1978, USGS MAP PREPARED FOR THE USFS, 1978

Giant Salamander) has been measured to 29 inches. At least 23 species of snakes are indigenous to the Park. The Smokies have one of the heaviest concentrations of Black Bear anywhere. From 400 to 600 are residents of the Park. For our avian friends, the Park ranks high for bird watching. Last but not least, the Red Wolf was recently reintroduced to the Smokies. Unfortunately, exotic species such as the European Wild Boar present problems to the Park's ecosystems and amply illustrate the folly of human tampering.

SOURCE OF THE DIVERSITY

Origins of Southern Appalachian flora have been obscured by passing eons. We can only speculate about the effects on vegetation from past epochal events: changing levels of carbon dioxide, drifting continents, rising and eroding mountains, advancing and retreating ice sheets, prolonged drought. The continents drift northward and plants stressed beyond their climatological tolerances disappear. Unimaginably long time periods pass. Pleistocene glaciers creep forward. Plants retreat southward to warmer climes. The advancing walls of frozen water stall—short of the Southern mountains. The ice sheets retreat. Plants return. Too simple? We'll never fully understand. But this we do know: The current diversity of the Southern mountains is maintained by a varied and favorable climate.

The region is a natural greenhouse—albeit a cool one at higher altitudes. As a whole, the Southern mountains receive abundant precipitation, meted out evenly over the year. The mountains seldom suffer prolonged dry spells. This contrasts with the South as a whole, which does suffer periods of drought; but the coastal plains, Piedmont, and broad valleys are affected most. Precipitation varies with aspect and elevation. High summits of Georgia, the Carolinas, and Tennessee can receive over 100 inches in wet years and average between 80 and 90. Lower slopes more commonly receive between 50 and 70. Extremes are great. The TVA recorded 145 inches over one 12 month period at Coweeta Station #8 near Highlands, North Carolina. Farther north, Mount Mitchell recorded 108 inches one year. The abundant precipitation is enhanced by fog and mist that enshrouds the summits on a high percentage of days. Once a nourishment, this added moisture now sentences the trees to frequent acid baths. However, species diversity is not the product of significant moisture alone. Plants that prefer dryer conditions grow in the rain shadows cast by higher peaks. The dryer sites average between 30 and 40 inches annually.

Growing up in the region, I never once heard the term "rainforest" used to describe the coves and summits of the Carolina, Tennessee, and Georgia mountains. Now the term is commonly applied to places that meet temperate rainforest criteria of at least 75 inches per year of moisture evenly distributed.

*This is an abridged version of the original map, which was prepared to accompany SouthPAW's Broader Southern Appalachian Bioregion Proposal.

EFFECTS OF ALTITUDE AND OTHER FACTORS

Another important climatic variable is temperature. The region's temperature range reflects its altitude range. Elevations range from below 600 to over 6600 feet—the greatest differentials in the eastern United States. The only comparable changes in altitude in the East are in the White Mountains of New Hampshire.

Interestingly, the effect of altitude on vegetation in the Southern mountains is enhanced by the latitude. The Southern Appalachians enjoy a relatively long growing season, were not scoured by glaciation, and with the exception of mountain tops, do not receive the high winds common to Northern counterparts. Growing conditions are favorable even for the boreal plants, as witnessed by the extraordinary sizes they achieve.

However, anyone imagining that the Southern Appalachians possess a balmy climate should bear in mind that the higher peaks are in the Canadian vegetation zone. Newfound Gap in the Smokies (altitude 5045 feet) recorded 242 inches of snow in one season. And in May of 1992, Mount Pisgah, a 5723 foot giant near Asheville, received an astounding 5 feet of snow during a single storm. Though infrequent, temperatures on these high peaks can drop to 25° below zero, while their warmest days seldom reach 80°. The valleys possess a milder climate.

The extremes of temperature and moisture produce microclimates that enhance diversity beyond what would occur in uniform conditions. A broad range of soil types and crisscrossing mountain ranges that present every conceivable angle to the sun's radiation complete the picture.

FROM DIVERSITY TO DIMENSIONS

The vegetative standouts of the Southern highlands are too numerous to list here. Many tree species reach record proportions. Plants that in other locations are classified as shrubs reach tree size in the moist, rich coves. In the Great Smokies, nearly 20 species of trees have worn the title of either state or national champion.

The ultimate "big tree" of the Eastern mountains may have been an American Chestnut recorded and photographed by the Park Service in the Balsam Mountains of North Carolina. It achieved an improbable diameter of 17 feet. The only other Eastern tree that has reached such proportions is the swamp dwelling Baldcypress. (The current national champion Baldcypress measures a whopping 53 feet 8 inches in girth at 4.5 feet off the ground.)

Today, we regard trees 17 feet in circumference as extraordinary. But coves in the Smokies once grew many chestnuts over 20 feet around. We are not likely to see such splendid sights again. The human-introduced chestnut blight has all but eradicated the species.

Fortunately for big tree aficionados, great girth is not limited to the chestnut. With the demise of *Castanea dentata*, presiding over the coves devolved to the lordly Tulip Poplar. Like the chestnut, *Liriodendron tulipifera* grows wide. Prior to exploitation by the timber barons, mature tulip trees in the Southern Appalachians commonly grew to 8 feet in diameter. My father recalls seeing in his youth an ox coaxed onto the stump of a tulip tree cut in northern Georgia's Cohutta Range. The ox stood with room to spare. The biggest tree cut in Haywood County, North Carolina was a giant Tulip Poplar that reportedly measured 12 feet in diameter.

Not all the big trees are gone. A few specimens in the range of 20-27 feet in circumference still grow in the Southern Appalachians. The Smokies have most of them. The Kilmer-Slickrock Wilderness of the Unicois has several, and the Nantahalas have at least one. Bear in mind that these trees have not matured in the open as have many trees that have reached great girth. The big tulip trees are denizens of closed canopy cove forests. They grow tall and straight. Their great boles often are clear of branches for 60 or more feet.

In fact, the Tulip Poplar is probably the tallest of hardwoods in the northern temperate zone. Sycamores, Black Walnuts, and Pecans are legitimate rivals, and on occasion oaks and White Ashes. However, measurements suggest that the tulip tree achieves heights of 150 feet more often than do other hardwood species. There are even reports of 200 foot poplars. The tallest confirmed height for the Tulip Poplar may be 193 feet.

In several areas of the Appalachians, I have measured tulip poplars to over 140 feet. The tallest poplar I have measured so far just eclipses 152 feet. It grows in the Horace Albright grove on the western side of the Great Smokies. Its location is conducive to measurement. Unfortunately other contenders there are not. I spotted what appears to be an exceptionally tall stand rising cathedral-like through a dense tangle of rhododendron. It is virtually impossible to get accurate measurements in such conditions without expensive equipment. However, I believe the tallest poplars are in the 155 to 165 foot range (the trees are always taller when they can't be measured!).

The Southern Appalachians also display impressive conifers of several species. An Eastern Hemlock, *Tsuga canadensis*, growing in Joyce Kilmer Memorial Forest exceeds 18 feet in circumference. One growing on the western slopes of the Smokies reaches 17. The largest of which I am aware measures 20. Until recently, this latter tree was the national champion. It was recently dethroned by a titan growing in West Virginia—18 feet around, but, at 123 feet, considerably taller than the Smoky Mountain tree.

That the torch should pass to a West Virginia tree is appropriate. According to historical accounts of the Mountaineer State, the hemlocks that grew at Dolly Sodds were gargantuan—larger than any growing today. Nourished by 15 foot deep beds, peat-like in composition, these behemoths reportedly reached up to 9 feet in diameter. Today most large hemlocks are less than half that size, so I am skeptical. But the Southern forests have been exploited for over a century. Ecosystems may have been destroyed that required hundreds or even thousands of years to develop. Such systems might have supported far larger trees. Tragically, this noble conifer is now threatened by another human-introduced pest—the Hemlock Wooly Adelgid.

Heaths, too, grow big in the Southern Appalachians. Mountain laurel reaches tree proportions. A laurel in South Carolina's Blue Ridge reaches 28 feet in height and 4 feet in circumference. A Smoky Mountain specimen makes 25 feet. The colossus of the heaths, though, is a South Carolina Rosebay Rhododendron that tops 40 feet in height! Putting these figures into perspective, the largest laurel I have found in my beloved Berkshires just makes 16 inches in circumference.

I'll leave exemplary tree growth after describing a stand of Yellow Buckeyes and Sugar Maples I visited last summer in the Big Ivy section of North Carolina's Craggy Mountains. Big Ivy possesses circumneutral soils that support exceptional plant diversity. Populations of 39 rare plant species have been listed for the area. I saw Wild Ginger plants with leaves 6 inches across. But the large woody plants stole the show. I measured Eastern Hemlocks and Northern Red Oaks over 14 feet in circumference. Near Walker Cove, we entered a stand of Sugar Maples containing trees over 130 feet in height. I measured one over

140. It may well be the tallest of its species growing anywhere on the planet. I plan to return soon to determine its exact height. I would appreciate hearing from anyone aware of a contender.

MOUNTAIN VASTNESS AND NATURAL BEAUTY

Spring spreads in gentle pastels across the Southern mountains. Brightly colored blossoms appear as ornaments on a soft cloak of pale green. From every point the land unfolds into an endless panorama of peaks, ridges, and valleys. The contours are soothing. Great age and the absence of glaciation have produced lines that flow. The eye beholds arcs instead of angles. The gentle curves impart a friendliness, a warmth that contrasts with the rugged appearance of their Northern counterparts, the White Mountains of New Hampshire.

Having mentioned that other great Appalachian range, I would be remiss if I didn't pay appropriate tribute to it. Besides, contenders for the titles of highest, deepest, largest, and oldest will always be scrutinized. The Whites are noble mountains—once thought to possess the highest summits in the eastern United States. In grandeur they easily equal their Southern cousins. The Whites bear the unmistakable imprint of the Wisconsin Ice sheet. Even today, notoriously bad weather haunts the higher summits of the Presidential and Franconia ranges.

By contrast, the Southern Appalachians pose a different challenge. The dense understory of laurel and rhododendron forms imposing barriers to all who would stray from the convenience of the trail. But to fully know these mountains requires a return to numbers. I now timidly present another dose of statistics.

THE GAME OF ALTITUDES

Depending on what one counts as a separate mountain, the Southern Appalachians can legitimately claim between 46 and 50 summits that reach 6000 feet or more above sea level. The Great Smokies boast 16 named peaks in that altitude range. The Blacks add another 13 as do the Great Balsam-Plott Balsam combination. The northern Unakas muster 3, and the Craggies add a lone 6000' summit, Great Craggy Dome. Four unnamed summits, 2 in the Smokies and 2 in the Blacks, could boost the total to 50. (At least 1 is dubious.)

If it seems like quibbling, be advised that the rules are vitally important to clubs of athletic "peak baggers" whose members climb mountains meeting altitude criteria. The Adirondacks have a club whose members climb the 42 (formerly thought to be 46) peaks over 4000 feet above sea level. Members of "South beyond 6000" climb the highest Southern summits.

For any interested in statistics with a twist, of the 6000 footers, 8 reach 2000 meters. One must travel to the western United States before again encountering a 2000 meter mountain. There, distinction is more appropriately earned by much higher peaks, for instance, those reaching 4000 meters (13,120 feet).

Approximately 300 peaks in the Southern Appalachians exceed 5000 feet. The terminus of the system, the Georgia Appalachians, boasts 34 summits over 4000 feet. West Virginia, in the Central Appalachians or northern part of the Southern Appalachians (depending on whom you ask), has numerous peaks over 4000.

These altitudes are better appreciated when contrasted to the Appalachians as a whole. The Central Appalachians contain 2000 to 3000 foot summits—lovely, long parallel ridges. Mount Davis, Pennsylvania's highest, reaches a modest 3212 feet. The Appalachians build back up in the North to assume respectable heights in New York's Catskills and Vermont's Greens. But it is New Hampshire's Whites that give the Southern mountains a contest. Thereafter, the chain gives one final heave, sending Maine's Katahdin to 5267 feet—a fitting terminus to the 2000 mile long Appalachian Trail.

At 6288 feet, Mount Washington is the soul Northern sentinel over 6000, unless Boot Spur, a perturbation on Mount Washington's southeastern shoulder, is counted as a separate peak. Altogether, the Northern Appalachians boast 14 summits over 5000 feet and 62 over 4000. The other great eastern range, the Adirondacks, has two peaks over 5000 and 42 over 4000.

THE CONFUSION OF LOCAL NAMES

Discussions of the Southern Appalachians often deal with the Alleghenies, the Blue Ridge, and the Smokies (a subrange of the Blue Ridge, originally considered to be part of the Alleghenies). Topographical features of this broad region include a complex of interlaced mountain chains that can bewilder geographers. However, the region can be reduced to two major mountain ranges—the Alleghenies and the Blue Ridge. Names such as the Cumberlands of Tennessee and Kentucky and Cheat Mountains of West Virginia are local names for parts of the Alleghenies. Both the Alleghenies and Blue Ridge cover large areas and each reflects a distinct mountain orogeny. This article focuses on the Blue Ridge.

Through most of Virginia, the Blue Ridge is relatively narrow and well behaved; but in southern Virginia the mountains assume a differ-

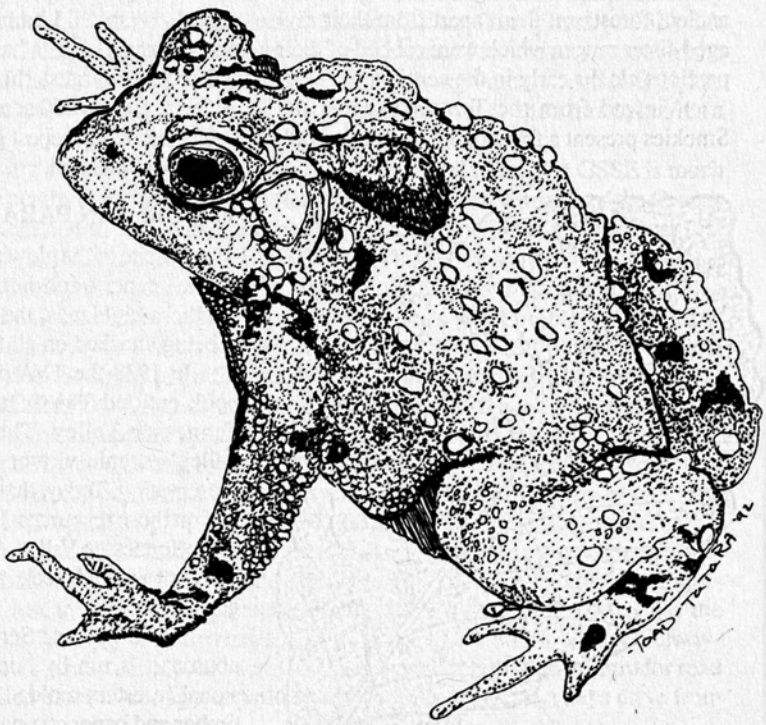


illustration by Jay Tatara

ent character. They broaden and gain in altitude, as evidenced by Mount Rogers at 5729 feet and Whiteside at 5500. Progressing into North Carolina the Blue Ridge separates into two broad fronts. The eastern front retains the name, Blue Ridge, all the way to its southern terminus in Georgia and South Carolina. However, the western front bears several names. From the north, the Unakas, then Great Smokies, followed by Unicois, and finally Cohuttas in northern Georgia. Connecting these two fronts are transverse ranges equal to the eastern and western flanks in height and ruggedness. The Blacks, Great Balsams, Plott Balsams, Pisgahs, Nantahalas, Cowees, Snowbirds, and several smaller ranges, such as the Swannanoa, create a topographic jigsaw puzzle fit to befuddle the best geologist. Yet all mountains are not created equal. The majestic Blacks are the uncontested roof of the eastern United States. Tiny patches of virgin forest clothe their summits. At 6684 feet Mount Mitchell is the loftiest. Mount Craig, at 6645 feet, is the second highest summit in the East. Beyond, are two other great peaks—Balsam Cone and Cattail Peak. The Great Smokies claim 2 summits over 6600 feet (Clingman's Dome, 6643; Mt. Guyot, 6621).

Though the Blacks edge out the Smokies for two highest summits, the Smokies boast over 100,000 acres of virgin woodlands. Their ancient forests set them apart from their ravaged sister ranges which were robbed of their precious cloaks early in the century.

Viewed from the Tennessee side, the Smokies present a formidable mountain wall. Old Black, Mt. Guyot, Mt. LeConte, and Clingman's Dome rise 5000 feet above their bases. Mt. LeConte's 6593 foot summit rises fully 5300 feet above its immediate base at Gatlinburg. For 36 miles, the crest of the Smokies stays over 5000 feet. They are too far south, however, to produce a timberline.

Permit me one last round of figures. Arthur Stupka, former Park naturalist, reports that Red Spruce in the Smokies have been measured to 162 feet in height! Several living specimens of *Picea rubens* exceed 13 feet in circumference. The champion, according to the American Forest Association, makes 14 feet 1 inch. In other regions, the largest, Red Spruce are from 6 to 9 feet around and 90 to 110 feet in height.

THE SEARCH FOR SUPERLATIVES

The Blue Ridge country encompasses over 11,000 square miles, and treasures abound throughout. North Carolina's Grandfather Mountain has been described as having "more rare, threatened, and endangered species than any upland area in the eastern United States." Near Highlands, North Carolina, Whiteside Mountain dominates the landscape with a near vertical face approaching 750 feet tall in places. Near Cashiers, Whitewater Falls cuts through the Blue Ridge escarpment with a drop of several hundred feet in 3 major falls. Many superlatives could be cited. Roan Mountain and Craggy Gardens have both been cited as the world's largest rhododendron gardens. Both are around 600 acres. Linville Gorge has been called the deepest gorge in the East with depths to 2000 feet.

TROUBLE IN PARADISE

In spite of the glowing picture just painted of the scenery and botanical wealth of the Southern highlands, the region is not well. It is being attacked on all fronts.

In 1938 the TVA published a masterful book entitled The Scenic Resources of the Tennessee Valley. The book extolled the valley's scenic virtues and advocated their preservation. Today, that agency is gorging itself on those resources. It is no longer a friend to the Tennessee Valley. Acid rain concerns the TVA not a whit. It seeks more and more power generation.

The US Forest Service, (FS) is another abuser. It is run by bureaucrats and professional foresters molded in the images of the timber and paper companies. FS timber managers make their living selling, not conserving, timber. Nothing less than a major agency restructuring can return the Forest Service to its intended conserver-caretaker role.

Problems exist even in areas under the jurisdiction of the National Park Service. The NPS does not suffer from the internal decay afflicting the Forest Service, but it is underfunded. NPS is unable to police the premises.

WHAT YOU CAN DO

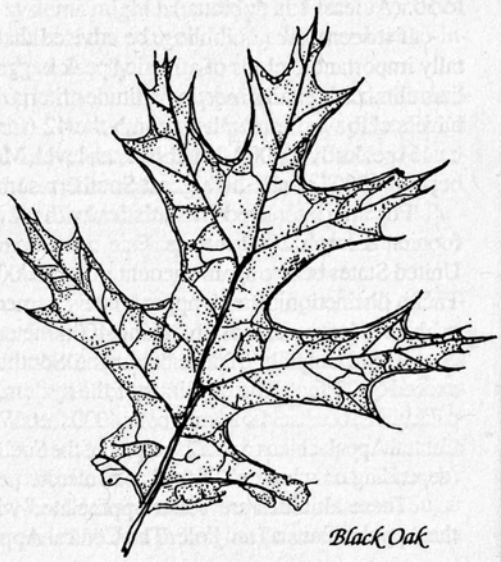
The news is not all bad. With the change of administration in Washington, the environment may finally have some friends in the executive branch. Plenty of Southern highlands residents welcome the change and will support the new administration's environmental leadership, if it materializes. We all must apply continual pressure on Congress to help offset the influence of the developers and the timber, pulp, and paper companies. SouthPAW is working to stop the creeping engulfment by blind development and the insatiable appetite of the timber interests. For information on their proposals contact SouthPAW at POB 3141, Asheville, NC 28802.

OLD-GROWTH CONFERENCE

To help boost understanding of Eastern old-growth, we are planning a conference to be held in Asheville, North Carolina, August 26-28, 1993. See Announcements this issue.

Robert Leverett (52 Fairfield Ave., Holyoke, MA 01040) is the East's premier old-growth evangelist. He measures about 5.8 feet tall.

Chestnut Oak



Black Oak

leaf illustrations by Jerry Lee Hutchens

The Greater Salmon/Selway Project

by Howie Wolke

*ABSTRACT: South of Alaska, much of the remaining big wilderness in the US occurs in a number of geographic clusters I call "wilderness complexes." These wilderness regions are fairly obvious on the national map of the largest remaining roadless areas in the continental United States (*The Big Outside*, by Dave Foreman and Howie Wolke, Revised Edition, Harmony Books). These are regions of primarily public land where big chunks of wilderness in close proximity dominate the landscape. The Greater Salmon/Selway Wilderness Complex, which includes a core Greater Salmon/Selway Ecosystem is our biggest such region south of Alaska. Our other major wilderness complexes are Greater Yellowstone, Greater Glacier Divide, North Cascades, High Sierra/Death Valley, California Desert, Canyon Country, San Juan, Gila/Blue Range/Aldo Leopold, Big Bend, Everglades/Big Cyprus, Adirondacks, Boundary Waters/Peatlands, and Cabeza/Organ Pipe/Pinacate. Smaller but ecologically significant wilderness complexes include the Klamath Mountain region, Southern Appalachian Highlands, White Mountains of California, and southern Nevada Desert.*

Through my office window the western Montana blue winter forest—cobalt sky, deep snow, and conifers—illuminates my desk-top yellow legal pad. The forest reminds me that I live within The Big Wild.

Mostly in central Idaho, The Big Wild extends into extreme western Montana along the Bitterroot, Beaverhead, Anaconda-Pintler, Sapphire, and Pioneer Ranges. The Big Wild is still mostly primeval, broken only by a light touch of civilization. The Big Wild is the Greater Salmon/Selway Wilderness Complex, which includes the core Greater Salmon/Selway Ecosystem (GSSE). It's probably the wildest remaining forest region in the world, and is named for the two central Idaho rivers that drain most of the Ecosystem. And let's be adamant: though most Americans equate Idaho with the terms "baked," "mashed," or "fried," this is wilderness, not spud farms; but it's a wilderness under siege.

Here is the biggest unroaded wilderness in the lower 48—about 3.3 million acres...that's slightly larger (and considerably more valuable) than Connecticut.

Unfortunately, few are aware of this treasure of wild land and wild life. The GSSE is much less well known than the nearby Greater Yellowstone Ecosystem. To raise the profile of the Greater Salmon/Selway Ecosystem and to help create the level of public recognition and pressure that might save it, I've begun the Greater Salmon/Selway Project. This article is part of that project.

In this undertaking, I recognize that mailbox clutter wastes forests, hogs landfills, and adds to the greenhouse effect when it burns. Waste paper is one of America's worst problems—as bad as drug and computer dependency—so I won't add to it. The Greater Salmon/Selway Project is not another group with newsletters, alerts, pleas for money, raffles, credit card offers. You read this and <u>you</u> spread the word. For if wildland conservation can't save this, the wildest landscape in temperate North America, then we probably won't save very much of anything.

Let's begin with superlatives. The heart of the GSSE is the Frank Church River of No Return Wilderness (RNR), at 2.3 million acres, the biggest designated Wilderness in the lower 48 states. Along with the contiguous Gospel Hump Wilderness (207,000 acres, and don't ask about the name) and surrounding unprotected roadless lands (800,000 acres), here is the biggest unroaded wilderness in the lower 48: about 3.3 million acres. That's slightly larger (and considerably more valuable) than Connecticut. Just to the north, separated from the RNR by one dirt road across the Magrudor Corridor, is our 7th biggest wilderness south of Alaska: the 1.8 million acre Selway-Bitterroot (1.3 million acres protected; 500,000 acres unprotected roadless). If the Magrudor road were closed, over 5 million acres of contiguous wilderness would be less than a days drive from Salt Lake or Seattle.

map by Brian Evans

But I digress; I said superlatives. Most of the northern two-thirds of the GSSE constitutes the largest essentially intact virgin forest remaining in temperate North America, and perhaps in the temperate world. The Greater Salmon/Selway includes more big roadless areas than any other wilderness complex in the US: there are 18 parcels of wilderness exceeding 100,000 acres in the core ecosystem, and another 14 within the ecosystem fringe (in the complex, outside the core ecosystem). That's 32 compared with 23 big wildernesses in the entire Greater Yellowstone Ecosystem. The complex has dozens of smaller unprotected roadless wildlands. Lightly roaded semi-wild and rural land also provide habitat for many species. Towns are few and far between: Salmon (ID), McCall (ID), and Hamilton (MT), are the largest towns within the complex; all outside the core ecosystem, all with populations under 5000. Missoula lies just northeast of the complex; Boise just to the southwest. The nearby Greater Hell's Canyon/Wallowa Ecosystem on the Idaho/Oregon border is the western extremity of the complex, and is closely related to the GSSE.

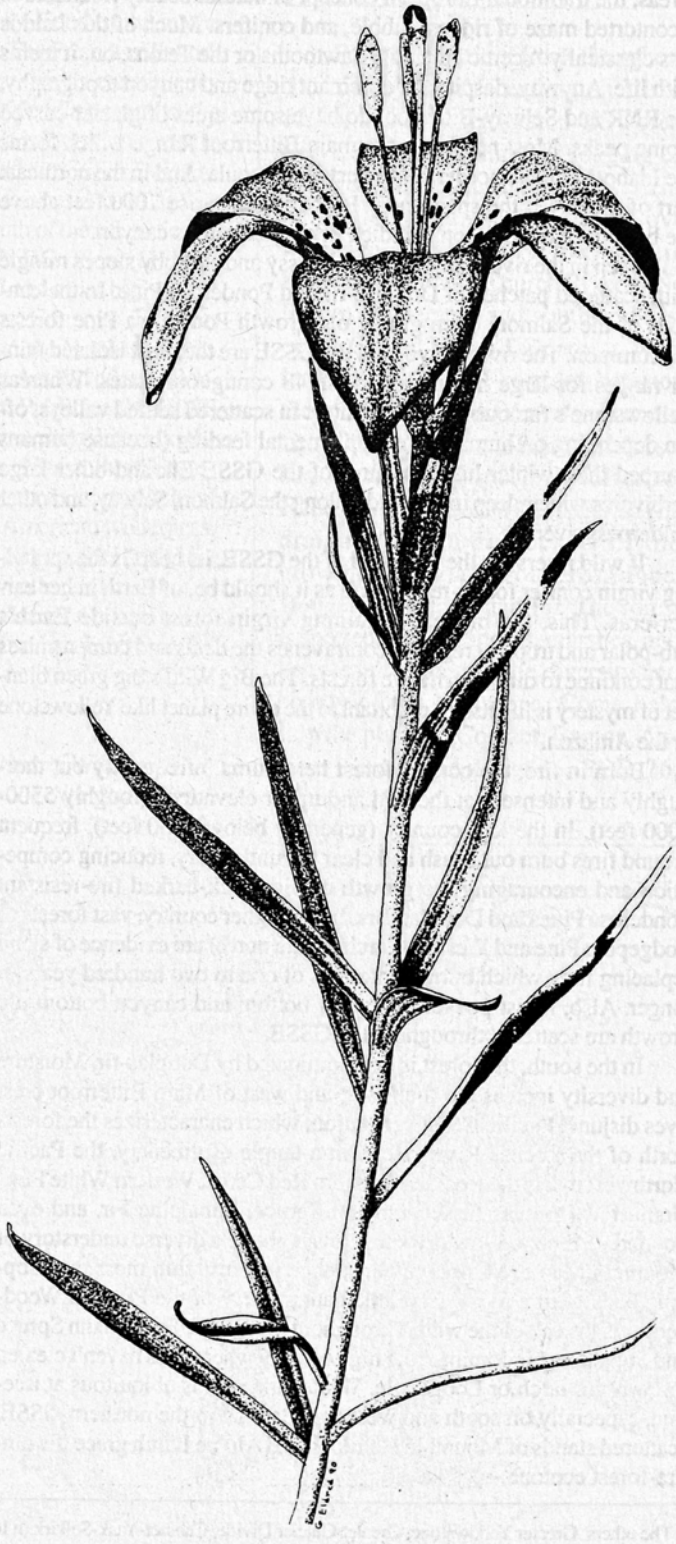
More superlatives: The Salmon River is the wildest river in the lower 48; its Middle Fork flows entirely within wilderness (the RNR), and its Main Fork is the second longest free-flowing river in the lower 48 (the Yellowstone is the longest). The Main Salmon's canyon, a spectacular east-west chasm across central Idaho through the RNR, is deeper than the Grand, second in North America only to Hell's Canyon. The Ecosystem's other namesake river, the Selway, eats a higher proportion of rafters than any other river in the US. Its contribution to human population control is tempered, though, by the Forest Service's strict permit system, which permits few boaters to float the river each season.

The Greater Salmon/Selway Ecosystem and complex is a land of extremes, with unsurpassed ecosystem diversity. East of the core ecosystem but within the wilderness complex are rugged mountain ranges and arid to semi-arid valleys. The Lost River, Lemhi, Beaverhead, Anaconda-Pintler, Pioneer, and Sapphire Ranges rise above a sea of high grassland and sagebrush, Pronghorn, and jackrabbit. All of these ranges are still primarily wild. In the region within and around Lemhi and Lost River mountain ranges, the Northern Rockies meet the Great Basin.

Another "fringe area," just south of the GSSE but within the complex, is the volcanic "desert" of Craters of the Moon National Monument and adjacent BLM roadless areas, including the Great Rift. Some of the basaltic lava flows are under 1000 years old, and the Great Rift's "kapukas" (isolated plant communities within the lava which escaped recent flows) belie the term "desert." Protected by miles of barren rock, many kapukas have never felt the hoof of a cow or sheep. They support a rich flora of native grasses, forbs, and sagebrush. During spring, kapukas are downright lush. Many ecologists consider "sagebrush steppe" to be a more accurate description of the so-called high desert of southern Idaho. "Cow desert," alas, also describes this land, since livestock have created a "desert" of sagebrush and dirt where native bunchgrasses once dominated the landscape.

The southern part of the GSSE proper is rugged glacier-cut alpine mountains. The Sawtooth, Soldier, Boulder, White Cloud, White Knob, Pioneer (a different range from those east of Montana's Big Hole Valley) and Smoky Mountains rise in stark contrast to the high "desert" just to the south, and to the more forested ridge and canyon terrain just to the north. Here's another superlative: The Boulder-White Cloud Roadless Area (545,000 acres) in the Challis and Sawtooth National Forests is the biggest entirely unprotected roadless area in the lower 48 states.

North of the alpine mountains lies a sprawling and rugged dis-



Wood Lily (Lilium philadelphicum) by Gary Eldred

sected upland dominated by forested ridges-the essence of the Greater Salmon/Selway. Here, in the RNR and Selway-Bitterroot Wilderness Areas, the traditional European concept of natural beauty flounders in a contorted maze of ridges, rubble, and conifers. Much of this land is less classically "scenic" than the Sawtooths or the Tetons, but it teems with life. Anyway, despite the dominant ridge and canyon topography, the RNR and Selway-Bitterroot do have some areas of glacier-carved alpine peaks. Most notable is the main Bitterroot Range which forms the Idaho/Montana border southwest of Missoula. And in the northeast part of the RNR, the spectacular Bighorn Crags rise 7000 feet above the bottom of the Salmon Middle Fork's precipitous canyon.

Deep in the river canyons, open grassy and shrubby slopes mingle with scattered patches of Douglas-fir and Ponderosa Pine. In the canyons of the Salmon, open grassy old-growth Ponderosa Pine forests are common. The river canyons of the GSSE are the most isolated winter ranges for large herbivores in the 48 contiguous states. Whereas Yellowstone's famous Elk herd winters in scattered settled valleys, often depending on humans for supplemental feeding (because humans usurped their winter habitat), most of the GSSE Elk and other large herbivores winter deep in the wilds, along the Salmon, Selway, and other wilderness rivers.

If wild rivers are the lifeblood of the GSSE, its heart is the sprawling virgin conifer forest-relic of life as it should be, of Earth in her earlier eras. This, the biggest remaining virgin forest outside Earth's sub-polar and tropical regions, contravenes the deals and compromises that continue to diminish native forests. The Big Wild's big green blanket of mystery is life itself, important to the entire planet like Yellowstone or the Amazon.

Born in fire, the conifer forest here burns infrequently but thoroughly and intensely at the mid and upper elevations (roughly 5500-8000 feet). In the low country (generally below 5500 feet), frequent ground fires burn out brush and clear the understory, reducing competition and encouraging the growth of big, thick-barked fire-resistant Ponderosa Pines and Douglas-firs. In the higher country, vast forests of Lodgepole Pine and Western Larch (in the north) are evidence of stand replacing fires which burn at intervals of one to two hundred years or longer. Also, moist pockets of valley bottom and canyon bottom old growth are scattered throughout the GSSE.

In the south, the forest is dry, dominated by Douglas-fir. Moisture and diversity increase to the north, and west of Main Bitterroot crest lives disjunct Pacific Coast vegetation, which characterizes the forests north of the Lochsa River. Here, in a tangle of greenery, the Pacific Northwest meets the Rockies. Western Red Cedar, Western White Pine, Grand Fir, Douglas-fir, Engelmann Spruce, Subalpine Fir, and even Ponderosa Pine (on low dry sites) tower above a diverse understory of Mountain Maple, Menzezia, Huckleberry, ferns, club moss, and sopping beds of true moss. Here, the haunting cry of the Pileated Woodpecker is the call of the wild. Throughout the GSSE, Engelmann Spruce and Subalpine Fir dominate the high country where fires haven't cleared the way for larch or Lodgepole. Whitebark Pine is ubiquitous at treeline, especially on south and west aspects; and in the northern GSSE, scattered stands of Mountain Hemlock and Alpine Larch grace the tundra-forest ecotone.

So here it is: ridges and canyons, isolated bastions of glacier-carved peaks, endless conifer forests, steep grassy breaks, sun-blasted Ponderosas, dripping moss beds, and big vistas of sagebrush; Pacific drizzle and twelve foot deep snowpacks, hundred degree summer days and fifty below zero winter nights, summer snowstorms and winter thaws. That's the essence of the Greater Salmon/Selway Complex: an astonishing array of habitats and climates supporting a plethora of native species including Sockeye and Chinook Salmon; Bull, Rainbow, and Cutthroat Trout; Mule and White-tailed deer; Moose and Elk; Mountain Goats, Bighorn and Pronghorn; Bald and Golden Eagles, Lynx, Fisher, Wolverine, Marten, and even a few Gray Wolves. Here are Boreal Owls and Northern Goshawks. Black Bear abound. So do mosquitoes, Wood Ticks, and Tick Fever Rickettsia, a microbe troublesome to humans and particularly common in the Bitterroots. This land, more than any other in North America, is the stronghold of the big tawny cat, the Cougar or Puma, often called the Mountain Lion after being exterminated from most of her historic non-mountainous habitat. And throughout the GSSE is the spirit of GRIZ, *Ursus arctos horribilis*, exterminated but soon to return, symbol of other eras, of life itself, of tolerance for life, and of our hope not for mere survival but for the kind of survival that's worth fighting for.

The Greater Salmon/Selway Ecosystem is one of six major wildland ecosystems within the Wild Rockies Bioregion.* Again, the GSSE lacks the fame of other ecosystems such as the Greater Yellowstone and Greater Glacier Divide. Even the much smaller Hells Canyon/Wallowa Ecosystem has received more press, largely due to a strong grassroots effort, led by the Hells Canyon Preservation Council, to designate a Hells Canyon National Park and Preserve. Ironically, the huge size of the Salmon/Selway Complex dictates against simple proposals, and central Idaho's remoteness has prevented the emergence of a strong constituency. The Northern Rockies Ecosystem Protection Act—a bill authored by the Alliance for the Wild Rockies and supported by dozens of organizations, businesses, and individuals—would go a long way toward protecting the native biodiversity of the GSSE and the Wild Rockies as a whole.**

Earlier, I mentioned that the GSSE is under siege. That's being mild, like saying Custer had trouble. Federal agencies led by the US Forest Service and regional politicians loyal to their PAC contributors have encouraged big timber, mining, and development corporations to assault this lightly populated region.

For example, the Forest Service plans over 60 timber sales in potential additions to the River of No Return Wilderness. Because few conservation groups have proposed to protect these lands, the opportunistic Forest Service feels that it can assault them with little fanfare. The ongoing Cove and Mallard timber sales on the Nez Perce National Forest, just north of the Main Salmon and adjacent to the RNR, may be the most destructive timber sales in the Northern Rockies, and are the site of ongoing civil (and some not so civil) protests [see sidebar].

Logging and road-building plans threaten almost every remaining unprotected roadless area in the GSSE. Nearly all of the half-million acres of roadless wildlands contiguous with the Selway-Bitterroot are threatened. The big roadless areas north of the Lochsa River—the Great

* The others: Greater Yellowstone, Greater Glacier Divide, Cabinet-Yaak-Selkirk (n ID and nw MT), Hells Canyon/Wallowa, and Canadian Mountain Parks (Banff, Jasper, etc.).

** The Northern Rockies Ecosystem Protection Act (NREPA) would protect the ecological integrity of the Wild Rockies by designating as Wilderness roadless public land within the major ecosystems, maintaining viable habitat corridors between the ecosystems, and embarking on a program of Wildland Recovery Areas.

Burn, Mallard Larkins, Bighorn Weitas, and Meadow Creek—are all under the gun. Here, in a remote setting of high ridges and basins, burned slopes and old growth canyons and blue ribbon trout streams, is the inland Pacific realm of the GSSE. The Idaho Fish and Game Department (one of the better agencies) rates these areas as the most vital unprotected wildlife habitat in the state. On the Boise National Forest, the Red Mountain and Peace Rock Roadless Areas and critical low elevation potential additions to the Sawtooth Wilderness are threatened. Visible from my home, the Allan Mountain Roadless Area links the wilds of the RNR and Selway-Bitterroot with a string of wildlands running southeast along the Continental Divide all the way to Yellowstone. Allan Mountain is a shrinking island of habitat surrounded by clearcuts, its future as a biological corridor more in doubt with each new clearcut. Even the scrawny Lodgepoles of Montana's Big Hole watershed are being clearcut....

Modern hard rock mining makes clearcutting look benign and has already obliterated parts of the fringes of the Idaho Batholith, a huge igneous granitic intrusion that forms much of central Idaho's rugged dissected upland. New mining proposals continue to surface. Pegassus Mines may soon propose a gigantic open-pit cyanide leach gold mine in the Blue Joint Roadless Area near Nez Perce Pass. This 60,000 acre area is Montana's claim to the RNR, part of the 800,000 acres of de facto wilderness that should be formally added to our largest designated temperate Wilderness.

Logging and mining are the biggest threats, but there are many more. Subdivisions, overgrazing, invasion of noxious weeds (which usually follow the invasion of noxious bulldozers), and poor wilderness management also wreak ecological havoc.

Despite the ongoing assault, the GSSE still supports nearly all its known indigenous vertebrate species. Only the Grizzly Bear (formerly widespread) and the Mountain Caribou (native to the northern half of the GSSE) are known to have been extirpated. Without comprehensive protection, though, as wildlands become more fragmented and isolated from one another, more species will become locally and regionally extinct and native biodiversity will plummet.

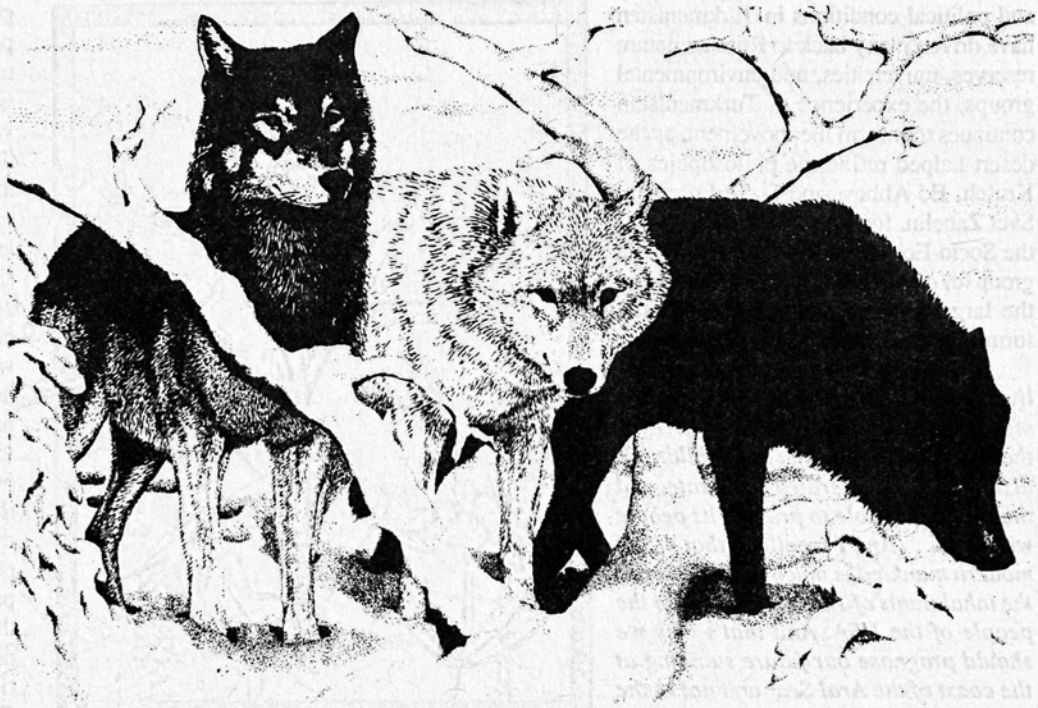
Back to the Project. Through slide shows, articles, talks, letters, and media work, the Greater Salmon/Selway Project will plant the Greater Salmon/Selway Ecosystem in the public's consciousness. The Project will work to develop a stronger grassroots constituency within the region, and if funding permits, the Project will function as an information center to help activists better defend the GSSE. Doing so will improve the odds of saving and restoring this, our wildest landscape south of the subarctic.

WHAT YOU CAN DO: Plenty! Protest the demise of the GSSE and other big wilderness complexes by writing Congress. Tell your representatives to support the Northern Rockies Ecosystem Protection Act and other visionary pieces of legislation. Publicize the GSSE by word of mouth and by writing letters to the editors of newspapers. Name the Greater Salmon/Selway Ecosystem as an example of what's happening to the American wilderness. Point out that this isn't just another social issue; it's the question of whether or not to maintain life as we know it on Earth! And next time you order potatoes with a meal, remind the waiter that Idaho grows—and needs—more wilderness than potatoes....

Howie Wolke is author of Wilderness on The Rocks *and co-author (with Dave Foreman) of* The Big Outside.

Get Thee to Dixie

Forest defenders from thoughout the country are descending on Dixie, Idaho, this summer to stop US Forest Service road-building and logging on the Nez Perce National Forest. The embattled area, the Mallard/Cove Drainage, is situated on the northern border of the Frank Church River of No Return Wilderness and south and east of the Gospel Hump Wilderness. Mallard/Cove is a vital corridor between those two Wilderness Areas— home to Gray Wolves, Chinook Salmon, Moose, bear, several owl species, Wolverine, Fisher, and countless other species. The drainage has large pockets of old growth, with giant Ponderosa Pine, Douglas-fir, and Grand Fir. The forest is spotted with meadows, marshes, and bogs, each adding to the diversity and beauty of the landscape. Come help stop the plunder! Contact: Ramon, Ancient Forest Bus Brigade, POB 26, Dixie, ID 83525.



Grey Wolves (Canis lupus) by D.D. Tyler (©1991 Diana Dee Tyler)

Deep Ecology in the Former Soviet Union;

or, How the Other Four-Fifths Live

by Eric Sievers

It is late and cold where I am sitting now in the Kara-Kum desert of Central Asia and my friend, in gathering firewood, has just uncovered both a nest of venomous baby *Eresus niger* spiders and an abandoned sack of ammonium nitrate. Between where the Soviets turned sand into gardens and where a sea became a desert, a day's walk from Iran, is where the green movement of the Soviet Union matured. In the late 1970s and early 1980s a horde of talented young researchers emigrated to the newly formed nature reserves of Turkmenistan, some to escape political oppression and some the frustration of the cities. The resulting circle of ecologists gathered often with guitars around campfires to argue philosophy and plan how to transform an outdated system.

It is almost a maxim among deep ecologists that deserts (and fire, guitars, and beer) give depth to ecological thought. Joseph Wood Krutch suggested that, "[the desert] brings man up against his limitations, turns him in upon himself and suggests values which more indulgent regions minimize."[1] Even though economic, social, and political conditions in Turkmenistan have driven many back to Russian nature reserves, universities, and environmental groups, the experience of Turkmenistan continues to inform the movement, as the desert helped refine the philosophies of Krutch, Ed Abbey, and Dave Foreman. Svet Zabelin, founder and coordinator of the Socio-Ecological Union, an umbrella group for over 300 local organizations and the largest environmental NGO in the former Soviet Union (FSU), comments:

I recollect Turkmenia, where I was living from 1979 till 1986. The environment itself is melting before our eyes there, the remedy for the high children's death-rate is accelerated birth-rate, and the land is not able to provide its people with food. . . And I recollect, that 4/5 of modern mankind is much more closer to the inhabitants of Turkmenia, than to the people of the USA. And that's why we should prognose our future standing at the coast of the Aral Sea[2] and not at the bank of Lake Michigan.[3]

Unfortunately, the movement in the FSU is still small and fighting a system even more resistant to change and reorganization than is our own. In reality, communism's downfall did not much affect the quality or composition of policy making bodies. Decision-makers in the FSU do not recognize prevention or reduction of pollution in addressing social and ecological problems, but permit only tertiary interventions, as the following example illustrates:

"Even though only five or six out of every hundred women in the world in 1989 lived in the USSR, every fourth recorded abortion in the world was performed on a Soviet woman."[4]

The system at least recorded abortions; it did not record and continues to ignore assaults on nature—assaults on one-quarter of the Earth's forests and on its deepest lakes. Despite hunger strikes in Siberia by women begging to have their children removed from industrial centers (in which almost all youth are so unfit that they are technically ineligible for military conscription), the general orientation toward environmental problems is that they cannot be addressed until the region attains economic parity with the West. According to this myopic view, economic strength means that a nation can buy environmental quality. This idea is advanced by Western nations' descriptions of "successful" phase-outs of lead in gasoline and curbing of toxic emissions from factories.

Notwithstanding the superficially appealing example of the West, the future will surely not be as the FSU imagines; its expectations are embedded in the same paradigm that was the backbone of the Soviet system—a faith in the unbounded possibilities of science and technical control. The FSU's economic goals are made even more untenable by the staggering toll pollution is taking. Human health costs of pollution, for example, have taken 11% of the gross GNP.[5] Great chunks of wilderness are being munched to feed a conviction that since seventy years of Communist rule are over, folks can finally

Arctic Lupine (Lupinus arcticus) by Mara Bacsujlaky

get what they deserve—video cameras and Snickers. Few people talk of preserving millions of roadless hectares, the largest predators in the world, and treasures like Lake Baikal.

Even among those with the will to fight for these treasures, the last seventy years have left their mark. Although communism and its attendant rhetoric are shunned throughout the FSU, the emerging green movement is nevertheless very Soviet. Paradoxically, its leaders and most of those in its ranks have natural science degrees, and many strong voices for ecology are respected academics; while a continuing doctrine of "expertise" often prevents other people from contributing. Those without formal scientific training have difficulty seeing a place for themselves in matters of ecology. Undoubtedly, the potential of conservation efforts is bounded by the number of people seen as "unqualified" to be part of the solution.

However, to steer away from pessimism, it is mollifying that future *Wild Earth* subscribers here in the FSU are working for wilderness, and are recognizing a broader perspective. Roderick Nash has described the formative influence that turn of the century Russian philosophy and biology had on the development of deep ecology in the West.[6] Although three generations in Eurasia have been removed from these currents of thought, as the green movement here grows, activists are finding not only much to learn from the West, but also much fertile ground within their own culture.

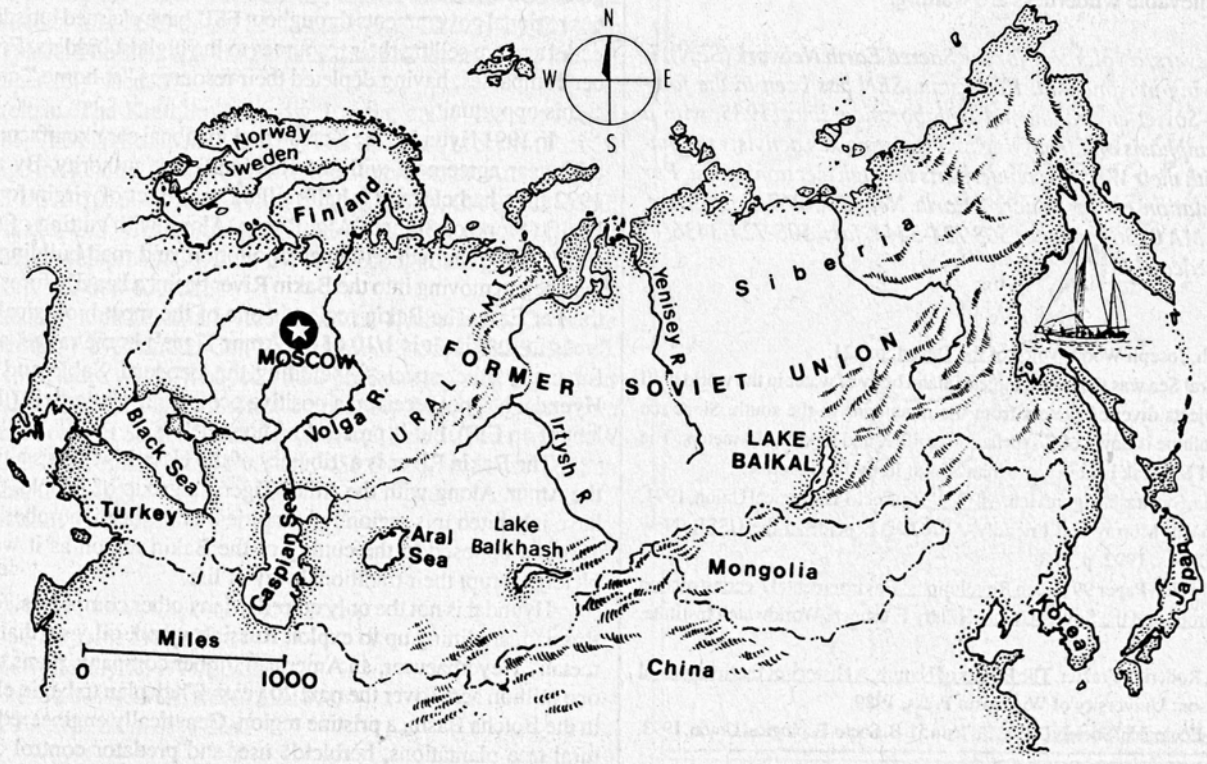
Evidence of a new orientation to environmental problem solving is surfacing in the FSU. Two years ago, Cossacks, apparently in an environmental protest, monkeywrenched oil drilling equipment on the Russia/Kazakhstan border. Also, the anonymous "Black Ravens" have been linked to an animal liberation raid at the Nizhegrodskaya hospital in Moscow last year and the monkeywrenching of logging operations in Penza. The following note was left in Penza:

We put out of operation, with the use of a homemade bomb, equipment which was being used for the destruction of the Akhunski Forest by factories in Penza-19. Two bulldozers, a tractor-trailer, and a steam shovel were damaged. We also spiked trees in the area of felling with construction nails so that chain saws will be damaged.[7]

The Black Ravens said they had taken action because over 400 hectares of forest, instead of the promised 21, had been cut. The note ended with a call to the population of the area to help stop the destruction of the forest by any means necessary, "right up to an armed picket line like that of the Udege people against the Svetlaya joint venture."

The most publicized environmental struggle in the former Soviet Union is that of the Udege in the Russian Far East, for rights to their ancestral lands and protection of their forests from Hyundai. About three years ago, Hyundai began cutting east of Udege land in an experimental five year project. Two and a half years into the project, claiming it had exhausted the potential of the land it had been granted, Hyundai began illegal cutting in Udege territory. Armed Udege hunters went to the scene and eventually Hyundai withdrew from that sight. The regional governor of Primorski Krai has tried repeatedly to turn Udege land over to the Svetlaya project and the regional parliament has repeatedly tried to have the land officially turned over to the Udege. Both sides have had numerous victories and defeats in the regional and national courts, but no final decision has been reached; each court decision resets the process.

Concurrent with these efforts, many scientists are forming relationships with native groups, social organizations, and green groups to develop environmental legislation, conservation plans, and other innovative approaches to ecological protection. These alliances have yielded sustainable forestry plans for areas near Lake Baikal, in Primorya, and near Khabarovsk. Unfortunately, a lack of hands, information, com-



munication, and organizational skills fetters these efforts, despite the help in all three cases of international organizations.

The next two to three years will define legally and socially the future of wilderness in the FSU. Many new national parks are springing up, while just as many nature reserves are seeing funding cuts and layoffs force managers to close their eyes to suspicious activity within their boundaries. Nature reserves are, in principle, havens where not even recreation is allowed, but deviances from policy have progressed far. For example, part of a reserve in the Far East is reportedly being leased to a logging firm.

Without the forests and rivers of the FSU, there is little chance for wilderness in America, a point that needs to be emphasized to *Wild Earth* readers. Activists in the FSU are thirsting for the bold thinking going on around the campfires in North America. Especially in Russia, this thinking could have a huge influence on conservation activism and practice. Few of us doubt the value of Siberian and Far Eastern forests, but perhaps only five people from the international community representing something like a biocentric viewpoint are working in the FSU, and maybe two are actually living in Siberia or the Far East.

The philosophy that unites *Wild Earth* readers recognizes a responsibility to wilderness everywhere yet stresses the primary importance of local activity. However, if the taiga is caught in this paradox and we only operate on a local level, one-quarter of the world's remaining forests may fall into the control of timber interests.

From the Korean border to Kazakhstan, from Lake Baikal to the Aral Sea, I have met with groups requesting the moral, technical, philosophical, and experiential support of their counterparts in the US. To come over and make a commitment to work with a group for several months could have a tremendous impact. Incredible people, great songs, unbelievable wilderness are waiting.

Eric Sievers, a volunteer for the Sacred Earth Network (SEN), is currently living in Alma-Ata, Kazakstan. SEN has been in the forefront of US-Soviet environmental collaboration since 1985, with a particular emphasis on identifying and assisting key activists to communicate with their Western counterparts through electronic mail. For more information contact Sacred Earth Network, 267 East Street, Petersham, MA 01366; phone; 508 724-3443, fax: 508-724-3436, e-mail: "sacredearth@igc.org.

NOTES

1 Krutch, Joseph Wood. Voice of the Desert. p. 221.

2 The Aral Sea was the fourth largest inland body of water in the world until irrigation projects diverted waters from the mountains to the south. Since the 1960s total volume is down 66%, surface area 40%, and level by 13 meters. The former port of Muynak is now more than 50 km from the shoreline.

3 Zabelin, Svyataslav Igorevich. All Our Life. Socio-Ecological Union, 1991.

4 Feshbach, Murray and Friendly, Alfred Jr. Ecocide in the USSR. New York: Basic Books, 1992. p. 208.

5 Worldwatch Paper 99 Green Revolutions: Environmental Reconstruction in Eastern Europe and the Soviet Union, Hillary F. French, Worldwatch Institute, 1990

6 Nash, Roderick Frazier. The Rights of Nature: A History of Environmental Ethics. Madison: University of Wisconsin Press, 1989.

7 Socio-Ecological Society (SEA) Bulletin 51-B. Socio-Ecological Union. 1993.

Deep Growls in the Former Soviet Union

Since the break up of its Communist society, the former Soviet Union (FSU) has suffered an economic crisis which is leading to the logging of forests and the killing of Siberian Tigers in Russia's Far East.

The price of bread in FSU has increased 100%, putting people in a desperate situation. Unemployment rates are higher than ever before, and little money is available to pay people who have kept their jobs. The people and leaders of FSU will do almost anything to free themselves of their financial burdens, including poaching Siberian Tigers and selling off the Siberian forest to timber companies.

Currently an estimated 300 Siberian Tigers survive in the wild. About 800 Siberian Tigers live in captivity. The Siberian Tiger is referred to as the Amur Tiger by scientists because they live in the Sikhute-Alin Mountain Range, in the Ussuriland region, which the Amur River drains. The Siberian Tiger actually lives south of Siberia. A female Amur Tiger typically uses 125-250 square miles of habitat, and a male ranges over 500-620 square miles. Needing large areas of habitat makes the Amur Tiger highly susceptible to extinction as forests are fragmented. In the 1930s the Amur Tiger population suffered a drastic population decline, leaving the species with fewer genes, making it even more difficult for the animal to adapt to altered environments. Large tracts of wilderness are essential for the survival of the Amur Tiger.

The Russian forests are already disappearing rapidly—with most of the timber harvesting done by clearcutting—and the deforestation is accelerating. Since the break-up of the Russian federation, there has been great confusion over which agency should administer what areas. Various regional governments throughout FSU have claimed jurisdiction over parks and are selling their resources to the highest bidders. Foreign timber companies, having depleted their resources "at home," are jumping at this opportunity.

In 1991 Hyundai, the Korean multinational car manufacturer, signed a 30 year agreement with the Russian forest authority. By the end of 1992 they had clearcut a half million acre tract of virgin forest on the Pacific Slope of Sikhote-Alin Range. Along with cutting of the forests came foreign human settlement, pollution, and road building. Hyundai then began moving into the Bakin River basin, a heavily forested area in the Far East. The Bakin region is one of the most biologically diverse areas in Russia. It is 1/10 of the Amur Tiger's home range, and habitat for many other species, including the Leopard, Sable and Reindeer. Hyundai has not received a positive ecological "expertizi" (the equivalent of an EIS), but is proceeding nonetheless.

The Bakin River is a tributary of the Ussari, which is a tributary of the Amur. Along with the Amur Tigers, a group of people, the Udege, have inhabited this region for centuries. The Udege, numbering around 700, are opposed to the cutting of the Bakin region as it would completely disrupt their traditional way of life.

Hyundai is not the only culprit. Many other companies, foreign and Russian, are lining up to exploit Russia's wood, oil, gas, diamonds and metals. Weyerhaeuser, an American timber company, plans to log over one million acres over the next 20 years. They plan to begin clearcutting in the Botcha Basin, a pristine region. Genetically engineered monocultural tree plantations, herbicide use, and predator control are among

Weyerhaeuser's sins. The Siberian forest grows at a slower rate than the forests of Washington and Oregon, thus plantation regeneration is doubtful.

The combination of forest depletion and poaching has put the Amur Tiger's future in doubt. The Amur Tiger has been legally protected in Russia since 1950; but since the decentralization of the USSR, protecting the Tiger has become extremely difficult. Poaching patrols have been cut drastically. Borders between regions once closed and closely regulated are now unrestricted, allowing people to pass through with any weapon of choice.

Currently, the Amur Tiger is valued at $4000-6000 (3,544,000-5,316,000 rubles). Poaching one Amur Tiger would provide a citizen enough money to live comfortably for five to ten years, quite a tough option to turn down. The fine for a poacher is $3.40 (3000 rubles). In 1992, 50 Amur Tigers were poached, 20 of these were killed in Lazo Preserve, a "protected park." In January 1992, three local poachers were arrested by police and security, after Sacred Earth Network's Eric Sievers posed as an interested buyer of Amur Tiger parts. On 16 February 1993 the KGB apprehended a poacher with a Tiger skin, and arrested another person on poaching charges. Such victories are rare.

Under CITES, the Convention on International Trade in Endangered Species, Tiger products are illegal to sell and trade; yet the market is extremely active in China, Japan, Korea, and Taiwan. The animal parts are used for medicinal and spiritual purposes. The once quiet city of Vladivostock, on FSU's east coast, is now alive with contraband traders and street merchants.

For many FSU citizens accustomed to the economic security of communism, the thought of protecting the trees and Tigers seems unaffordable. Until the Russian people overcome their economic problems and begin to work for the protection of their wilderness, the Tiger will remain threatened. International pressure must be put on Hyundai, Weyerhaeuser, and Russian leaders. Many conservationists believe that eco-tourism is the solution to saving the Tiger, but creating tourist facilities would be a lengthy process, and FSU might be an ecological disaster by the time they are in place. The situation in FSU is critical and letters to the following are desperately needed:

- Boris Yeltsin, The Kremlin, Moscow, Russia; and Professor Alexei Yablokov, The Environment Ministry, The Kremlin, Moscow, Russia. Encourage the funding of native park rangers to protect the Amur Tiger.
- Hyundai USA, 10550 Talbert Ave., Fountain Valley, CA 92723-0850; and Hyundai, S.S. Chae, Senior Executive Vice President, Hyundai Resources Development Co. Ltd., 140-2 Kyedong, Chongro-ku, Seoul, South Korea; **1-800-633-5151**.
- Weyerhaeuser, Scott Marshall, Vice President, Timberlands, Corporate Headquarters, Weyerhaeuser Co., Tacoma, WA 98455; **1-800-525-5440**.
- Tell the companies you will boycott their products and will urge others to do the same until they withdraw completely from FSU. For more information contact Sacred Earth Network, 267 East St, Petersham, MA 01366 and Rainforest Action Network, 450 Sansome, Suite 700, San Francisco, CA 94111.

—Kathleen Fitzgerald, Wild Earth staff

SOURCES

Wildlife Conservation, May/June 1993, p.22-29.
Audubon, May/June 1993, p.20-24.
Newsweek, January 18, 1993, p.51.
Rainforest Action Network, Action Alert #76.
Native Forest Network news alerts.

Departure

Broken by frost, flooded with snow,
the straight-line highway starts to crumble.
Kilometers click backwards
and the people help the road go south
back to the proudly indifferent cities.
They stand witness at the edge and
place gifts upon its back:
Sorrow, abuse, neglect, and anger
Boxes of broken families.
They crush empty bottles into the gravel surface
with turning heels and a level gaze.
Lichen returns from a few years' absence
Settles in, nods to its neighbors,
clings resolute to the rock.
Roots reclaim the barren strip.
Fine threads worm the cracks
and raise chunks of concrete
with slow and gentle palms.
The thick tar moans and buckles
like chafing ice on a spring-time river
that has burst the cold lock of winter
simply by moving forward.

—Patricia D'Angelo

Grouse Feather by Mara Bacsujlaky

Some Thoughts and Details on Biodiversity

part 2

Ethnobotany and Tropical Rainforests

by Wade Davis

These then are the potential gifts of the rainforest—plants that heal, fruits and seeds that bring forth the foods we eat, magic plants that transport us to realms beyond our imaginings. Yet, in unveiling this indigenous knowledge, we must seek not only new sources of wealth, but also a vision of life itself, a profoundly different way of living with the forest.

Most of the species doomed to extinction have yet to be described by science. Estimates of the total number of species range from 3 to 100 million. Incredibly, despite two hundred years of scientific research, we do not know the true number of species on Earth even to the nearest order of magnitude. Though approximately 1.5 million species have been taxonomically classified, most forms of life do not even have a scientific name. Virtually every time a botanist or an entomologist goes to the tropics he or she brings back species new to science.

What do we gain from the massive destruction of the tropical rainforests? In 1974 Volkswagen acquired 10,000 sq. kilometers of Brazilian rainforest, applied agent orange from the air and then torched the land, creating the largest manmade fire in recorded history. The most optimistic estimates of agronomists working at the sight suggested that cattle might be able to graze on the land for 12-14 years. Each cow requires a hectare of converted forest to yield a few dozen kilograms of meat. A single Brazil nut tree left standing in the forest produces one ton of protein rich seeds each year. Incredibly, there is today no place in the Amazon where forestland converted to pasture before 1980 is still supporting cattle. When one considers the true potential of the rainforest, raising cattle appears to be rather like using a Van Gogh to kindle a campfire.

The result of this wanton destruction is extinction, not only of plants and animals but of human societies that have over the course of thousands of years developed an intimate knowledge of the forest and the natural products it contains. Largely responsible for the deforestation are development programs initiated by governmental and international agencies struggling to deal with problems of massive debt, chronic population growth, poverty and unemployment. Worldwide, 35,000 people starve to death each day. Forty percent of human beings live in absolute poverty. The global population has doubled since 1950 and at the present rate of growth would double again within 40 years. Each year there are 90 million new human mouths to feed, many of them in the developing countries that contain the remaining tracts of tropical rainforest.

No protected area will endure if it conflicts with a people's fundamental struggle to survive. Inevitably, economic arguments will continue to dominate the public policy debate. Conservationists must seek an environmental policy consistent with these economic realities by showing that the long term income-generating potential of the standing forest equals or exceeds the short term gain resulting from their destruction.

Economic botany and ethnobotany can contribute to this strategy in several ways. First, ethnoecological studies of Indian adaptation may provide models for profitable and environmentally sound multiple land use management programs. Among the Mebêngôkre-Kayapó of central Brazil, for example, ethnobotanists have documented an indigenous system of integrated land management of remarkable sophistication. The biological use of insects, the manipulation of semi-domesticated plants, and the deliberate encouragement or transplanting of wild trees and medicinal plants along trailsides and in fields are all elements of a complex sustainable agro-forestry system that stands in marked contrast to the crude and destructive patterns of modern land use in the tropics.

Second, ethnobotanists can invoke the considerable economic potential of as yet undiscovered or undeveloped natural products. This

is by no means merely an academic pursuit. In the field of medicine, between 25 and 50% of modern drugs are derived from plants, and most of these were first used as medicines or poisons in a folk context.

Plants are useful as poisons or medicines because they have evolved complex secondary compounds and alkaloids as chemical defenses against insect predation. These defensive chemicals, which in certain plants may comprise 10% of dry weight, interact harmfully with the biochemical apparatus of the insects. The same properties, however, can be exploited by the modern chemist for therapeutic purposes.

Once extracted and identified, a chemical compound derived from a medicinal plant may be exploited in various ways. Plant extracts may be used directly as pharmaceuticals. Alternatively, they may serve as templates for the chemical synthesis of related medicinal compounds. Finally, in many cases the natural product may be used as a tool in the process of drug development and testing. Thus in seeking new drugs, researchers attempt first to identify any compound that is pharmacologically active. In many instances the difference between a medicine, a poison and a narcotic is a matter of dosage.

According to the World Health Organization approximately 88% of the people in developing countries rely chiefly on traditional medicine for their primary health care needs. This high degree of dependence, together with many thousands of years of experimentation, have yielded numerous plants of true pharmacological worth. Worldwide there are about 121 clinically useful prescription drugs derived from 95 species of higher plants, 47 of which are native to the tropical rainforest.

map by Brian Evans

To date only 5000 out of an estimated 250,000 to 300,000 higher plants have been studied in detail for their possible medical applications. Knowledge of tropical rainforest plants is especially inadequate. Though 70% of all plants known to have anti-tumour properties have been found in the tropics, over 90% of the Neotropical flora has yet to be subjected to even superficial chemical screening. At least 85% of the world flora of higher plants have yet to be examined for anticancer activity. In the Amazon out of 80,000 species of higher plants a mere 470 have been investigated in detail. Any practical strategy for expanding knowledge of this living pharmaceutical factory must include ethnobotanical work among the indigenous societies who best understand the forest. To attempt to assay the entire flora without the consultation of indigenous people would be logistically impossible, intellectually short-sighted and historically uninformed. Seventy-four percent of the 121 biologically active plant-derived compounds currently in use worldwide were discovered in a folk context, the gifts to the modern world of the shaman and the witch, the healer and the herbalist, the magician and the priest.

Identifying both psychologically and cosmologically with the rainforest, and depending on that environment for virtually all their material needs, it is not surprising that the indigenous peoples are skilled naturalists. The extent of their knowledge, however, and the sophistication of their interpretations of biological relationships can be astounding. The Waorani of the Ecuadorian Amazon, for example, not only recognize such conceptually complex phenomena as pollination and fruit dispersal, they understand and accurately predict animal behavior. They anticipate flowering and fruiting cycles of all edible forest plants, know the preferred foods of most forest animals and may even explain where any particular animal prefers to pass the night. Waorani hunters can detect the scent of animal urine at forty paces in the forest, and accurately identify the species of animal from which it came.

This perspicacious knowledge of the forest, combined with an active process of experimentation, has lead to the discovery of remarkable chemical properties of plants. Indigenous peoples of the Amazon, for example, employ dozens of different plant species as ichthyotoxins, biodegradable fish poisons. Some of these plants contain up to 20% rotenone in their roots. Placed into slow moving bodies of water, these poisons interfere with respiration in the gills of the fish. The fish float to the surface and are readily harvested. The peoples of Southeast Asia employ as a dart poison the latex of a tall forest tree, *Antiaris toxicaria*. The active ingredient is an extremely toxic cardiac glycoside that once released into the bloodstream precipitates lethal arrhythmias of the heart.

Other plants have yielded medicines or narcotics. The infamous Trees of the Evil Eagle, species of the genus *Brugmansia* in the Solanaceae family, contain tropane alkaloids that are useful in low dosage in the treatment of asthma. In higher dose, however, these drugs induce a frightening state of psychotic delirium marked by burning thirst and visions of hell fire, and ultimately stupor and death. All species of

Under the cloak of the visions, the user of ***ayahuasca*** *encounters the gods, the primordial beings and the first humans, even as he embraces for good and for bad the wild creatures of the forest, and the powers of the night.*

Brugmansia are psychotropic and may be smoked, ingested as decoctions or infusions, absorbed as enemas or administered topically as salves and poultices. Sorcerers among the Yaqui of northern Mexico anoint their genitals, legs and feet with a salve based on crushed datura leaves and thus experience the sensation of flight. Many believe that the Yaqui acquired this practice from the Spaniards; throughout Medieval Europe witches commonly rubbed their bodies with hallucinogenic ointments made from belladonna, mandrake, henbane, and datura. In fact, much of the behavior associated with the witches is as readily attributable to these drugs as to any spiritual communion with the demons. A particularly efficient means of self-administering the drug for women is through the moist tissue of the vagina; the witch's broomstick or staff was considered a most effective applicator. The common image of a haggard woman on a broomstick comes from the medieval belief that the witches rode their staffs each midnight to the sabbat, the orgiastic assembly of demons and sorcerers. In fact, it now appears that their journey was not through space, but across the hallucinatory landscape of their own minds.

Over ninety different species of plants in the Amazon yield curare, the flying death employed throughout the basin as an arrow and dart poison. The active principle is a muscle relaxant, d-tubocurare which, once isolated in the early 1940s, became an invaluable drug in modern surgery. What is fascinating about these curare preparations from an epistemological point of view is that their elaboration involves procedures that are either exceedingly complex or that yield a product whose use would not have been inherently obvious to the inventor. Curare is principally derived from a number of species in several genera of lianas (e.g. *Chondrodendron, Abuta, Curarea*). Generally the bark is rasped and placed in a funnel-shaped leaf compress suspended between two hunting spears. Cold water is then percolated through and the drippings collected in a ceramic pot. This dark coloured liquid is slowly heated over a fire and brought to a frothy boil numerous times until the fluid thickens. It is then cooled and later reheated, until a thick layer of viscous scum gradually forms on the surface. This scum is removed, the dart tips are spun in the viscid fluid and the darts are then carefully dried by the fire. The procedure itself is mundane. The realisation, however, that this orally inactive substance, derived from but a handful of the hundreds of forest lianas, could kill when administered intramuscularly is profound.

In the case of the ritual hallucinogen ayahuasca, the most important intoxicant of the Northwest Amazon, it is the sophistication of the actual preparation that is impressive. Though as many as seven species may be used, ayahuasca is most frequently prepared from two species of large forest lianas of the malpighiaceous genus *Banisteriopsis (B. caapi, B. inebrians)*. The drug may be made in various ways but generally the fresh bark is scraped from the stem and boiled for several hours until a thick, bitter liquid is produced. The active compounds are the beta-carbolines harmine and harmaline, whose subjective effects are suggested by the fact that when first isolated they were known as telepathine.

Significantly, the psychoactive effects of ayahuasca are enhanced dramatically by the addition of a number of subsidiary plants. This is an important feature of many folk preparations and is due in part to the fact that different chemical compounds in relatively small concentrations may effectively potentiate each other. In the case of ayahuasca, some 21 admixtures in morphologically dissimilar genera in distinct families have been identified to date. Three of these, the rubiaceous shrubs *Psychotria viridis* and *P. carthaginensis* and the malpighiaceous liana *Diplopterys cabrerana*, are of particular interest. All three of these plants contain tryptamines, powerful psychoactive compounds that are orally inactive due to the activity of an enzyme, monoamine oxidase, found in the human gut. Tryptamines can be taken orally only if combined with a MAO inhibitor. The beta-carbolines found in *Banisteriopsis caapi* are inhibitors of precisely the sort required to potentiate tryptamines. Thus when these three admixture plants are combined with the ayahuasca liana, it has a powerful synergistic effect, a biochemical version of the whole being greater than the sum of the parts.

Just how in a flora of tens of thousands of species the indigenous peoples managed to identify and combine in this sophisticated manner morphologically dissimilar plants with these unique and complementary chemical properties is one of the most important questions in ethnobotany. The traditional explanation has been "trial and error," a notion that upon close examination appears to be little more than a euphemistic veil obscuring our inability to provide an adequate answer. The indigenous peoples, by contrast, have rich cosmological explanations that are, from an endemic perspective, inherently logical.

How the shaman classify different varieties of ayahuasca is yet another botanical enigma. The Tukano of the Colombian Vaupés, for

illustration by Jim Nollman

example, consistently identify and name six kinds of yagé, which they distinguish by specific characteristics associated with the nature and intensity of the visions the plants induce. The Ingano of the upper Putumayo recognize seven varieties which they identify by the tone and key of the sacred incantations that the plants sing on the night of a full moon. To the western taxonomist, all of these indigenous varieties represent the same species and are morphologically indistinguishable.

Like most ritual hallucinogens, ayahuasca is a sacred medicine and a vital component of the shaman's repertoire, enabling him to diagnose illness, ward off evil, prophesy the future. But for the peoples of the Northwest Amazon, it is far more. Ayahuasca is the visionary medium through which man orients himself in the cosmos. Under the cloak of the visions, the user of ayahuasca encounters the gods, the primordial beings and the first humans, even as he embraces for good and for bad the wild creatures of the forest, and the powers of the night. Lifted out of the body, the shaman enters a distant realm, soaring as a bird beyond the Milky Way, or descending the sacred rivers in supernatural canoes manned by demons to reach distant lands where they may reconquer lost or stolen souls and work their deeds of mystical rescue.

Several tree species in the nutmeg family are the source of yet another important hallucinogenic snuff used in the western Amazon and adjacent parts of the Orinoco basin of South America. This sacred drug is known as *epená*, the semen of the sun. Taken as a snuff this tryptamine based hallucinogen induces not merely the suspension of reality, but the complete dissolution of the material world as we know it.

The source of this most remarkable hallucinogen is the blood red resin of the myristicaceous trees *Virola calophylla*, *V. calophylloidea*, *V. elongata* and *V. theiodora*. Preparations once again vary. The nomadic Makú ingest the resin directly, while other tribes, notably the Witoto and Bora, swallow pellets made from a paste of the resin. The drug is taken as a snuff by the Barasana, Makuna, Tukano, Kabuyaré, Kuripako and Puinave of eastern Colombia and various groups of the Yanomama in the upper Orinoco. To prepare the snuff, the bark is removed from the trees in early morning and the soft, inner layers are scraped. The shavings are kneaded in cold water which is subsequently filtered and boiled down to a thick syrup, dried, pulverized and mixed with the ashes of the bark of wild cacao. As in the case of ayahuasca, several admixture plants, including *Justicia pectoralis var. stenophylla*, may be added to potentiate the preparation.

Perhaps the most significant gift of the rainforest to the modern pharmacopoeia is coca, a sacred plant of the Incaic civilization that has played a critical role in the biological, cultural and spiritual adaptation of the South American Indians for over four thousand years. Originally native to the moist montane forests of the eastern flank of the Andes in Bolivia, cultivated coca had already become in pre-Columbian times differentiated by artificial selection into the four varieties employed by indigenous peoples today.

Erythroxylum coca var. coca, found today growing between 500 and 2000 meters on the eastern slopes of the Andes in Bolivia and Peru, is the major commercial source of coca leaves and of most of the world's cocaine supply. Amazonian coca (*E. coca var ipadu*) is commonly grown today on a small scale from cuttings by numerous indigenous groups of the Northwest Amazon. Curiously, though the two varieties are interfertile and contain many similar chemical constituents, Amazonian coca has a consistently lower cocaine content, generally half that found in other cultivated varieties. However, lowland peoples, particularly the Desana groups and the Witoto and Bora, have developed a unique means of maximising absorption of the nutritional and stimulant properties of the leaf. Wherever coca is chewed, native peoples have discovered means of changing the acidity of the mouth such that the cocaine content of the leaves may be absorbed. In most regions this entails adding some alkaline material (burnt seashells, limestone, various forms of ash mixed with urine and dew) to the quid of entire sun-dried leaves which are actually sucked rather than masticated. In the Amazon, by contrast, the leaves are dried in ceramic vessels over a fire, then pounded in a large mortar and pestle. Dried cecropria leaves are burnt to ash which is added to the coca powder. The final product is carefully filtered to the consistency of talc. Placed into the mouth, the powder is formed into a moist quid and slowly consumed.

Erythroxlyum novogranatense differs from *E. coca* in a number of morphological features, but more significantly it has evolved distinctive chemical and ecological traits and has become genetically isolated from its parental relative. *E. novogranatense* consists of two well defined varieties adapted through human selection to grow in arid conditions where *E. coca* could not survive. *E. novogranatense var. truxillense* is cultivated in the dry river valleys of the north coast of Peru between 200 and 1800 meters. It is grown largely for small scale local consumption and as a flavoring for the soft drink Coca Cola. *E. novogranatense var. novogranatense* is the coca of Colombia. Well adapted to xeric conditions, it is often grown in the arid inter-Andean valleys, along the Caribbean coast and in the Sierra Nevada de Santa Marta.

In sharp contrast to the disruptive and convoluted phenomenon of cocaine use in modern societies, the use of coca leaves in the Andes and Northwest Amazon is a force of stability and equilibrium. In many parts of the Andes distance is measured not in kilometers, but rather in coca chews. When people meet on a trail they exchange leaves, rather than handshakes. Those who divine the future by consulting the coca leaves are empowered to do so by having survived a lightning strike. Among the Kogi, who dwell in the Sierra Nevada de Santa Marta in northern Colombia, a young man begins to chew the sacred leaves at the time of his marriage. The high priests, or sacerdotes, emerge from their isolated huts to officiate at the ceremony. The priest impregnates the bride, and then perforates the gourd which will thenceforth contain the burnt seashells that will potentiate the coca leaves. Thus, as a man weds himself to a life of procreation, so he commits himself to a life of chewing the sacred leaves. The societal ideal is to abstain from sleep, eating and sex while devoting oneself to chewing the leaves and chanting to the ancestors. For the Kogi, as for so many tribes in Andean South America, the chewing of coca is the most profound expression of culture.

In addition to its crucial symbolic and religious function, coca plays a direct and critical role in the biological adaptation of Andean peoples. The leaves' small amount of cocaine, 0.5-1.0% dry weight, acts as a useful and mild stimulant in a particularly harsh environment. Coca leaves also have valuable vitamins, more calcium than any other known plant (an invaluable asset for lactating women in cultures that traditionally lacked a source of milk), and enzymes that may enhance the body's ability to digest carbohydrate at high elevation (a useful feature in a mountainous society that lives on potatoes). Coca is the remedy of choice for altitude sickness, and an effective medicine for stomach aches.

The bounty of the rainforest is by no means limited to medicinal drugs. Most of the common foods eaten in North America and Europe were first domesticated by indigenous peoples, and in many instances originated in the tropical rainforests. Indeed, if North Ameri-

cans had to subsist only on cultivated plants native to the USA and Canada, our diet would consist of pecans, cranberries, Jerusalem artichokes and maple sugar. Without the agricultural contributions of Central and South American Indians, Switzerland would have no chocolate, Hawaii no pineapple, Ireland no potato, Italy no tomato, India no eggplant, North Africa no chili, England no tapioca, and none of us would have vanilla, papaya or corn.

Of an estimated 75,000 human-edible plants found in nature, only 2500 have ever been eaten with regularity, a mere 150 enter world commerce, and a scant 20, mostly domesticated cereals, stand between human society and starvation. Yet the Amazon has wild trees that each yield 300 kilograms of oil rich seeds a year, a palm whose fruits have more vitamin C than oranges and more vitamin A than spinach, and another palm with seeds rich in oil and containing 27% pure protein.

What economic value can we place on the potential of these plants? In some cases the returns can be substantial and immediate. Brazil, for example, currently spends $95 million each year to import olive oil from Portugal. In the Amazon, however, is a palm, *Jessenia bataua*, which produces an abundance of seed oil that is, in terms of taste and chemistry, indistinguishable from olive oil. The development of this plant through artificial selection could permanently free the nation of a chronic drain on its trade balance. Another example of the economic potential of wild plants is a simple discovery made by Hugh Iltis, a plant explorer from the University of Wisconsin. In 1962 Iltis collected the seeds of an apparently useless wild relative of the tomato. That plant, however, once crossed back into cultivated tomatoes proved to have certain genetic traits that vastly improved the domesticated varieties. Iltis later calculated that his efforts cost the government agency that funded his research about $40. The value of his discovery to the tomato industry, however, has been estimated to be approximately $8 million a year.

These then, are the potential gifts of the rainforest—plants that heal, fruits and seeds that bring forth the foods we eat, magic plants that transport us to realms beyond our imaginings. Yet, in unveiling this indigenous knowledge, we must seek not only new sources of wealth, but also a vision of life itself, a profoundly different way of living with the forest.

A year ago I was in Sarawak, the Malaysian state in northern Borneo, living among the Penan, one of the last nomadic peoples of the tropical rainforest. In terms of species diversity, their homeland, a magical landscape of forest and soaring mountains, dissected by crystalline rivers and impregnated by the world's most extensive network of caves and underground passages, is one of the most significant regions of the world. Today it suffers from the highest rate of deforestation in the world. In a clumsy attempt to rationalise the decimation of these forests James Wong, the Sarawak Minister of the Environment, has gone on record as saying that it is a national embarrassment to have the Penan "running around the forest like animals." " They should be taught, " he has said, " to be hygienic like us and to eat clean food."

I recall a morning in which a group of visitors shared their "clean food" with Asik Nyelik, a nomadic Penan from beyond the headwaters of the Baram River. The night before, Asik had slept poorly in a bed and that morning at breakfast, looking rather tired, he sat uncomfortably in a chair. He drank from a glass of water as would a deer, dipping his mouth to the surface. Then came breakfast, a depressing offering of cold canned beans, a sorry looking fried egg, and a slice of tinned sausage. Asik politely looked around the table, then to his plate, then once again at the people eating this food. He rotated his plate, hunting perhaps for an angle from which the food might appear palatable. Backing away from the table with a look of sincere pity, he slipped out of the building and into the forest. An hour later smoke rose from the edge of the forest and Asik was found hunched over a fire, slowly roasting a mouse deer that he had killed with a blade.

Several nights later there was a full moon. It reminded Asik of a story he had heard about some people who had traveled to the moon and returned with dust and rocks. He asked if the story was true. Told that it was, after a moment of silence he asked, "Why bother?".

It is a strange set of values that has dictated the course of economic development in the tropical rainforests. At a time when the annual worldwide sales of plant derived pharmaceuticals totaled $20 billion, Daniel Ludwig spent $1 billion leveling a stretch of Brazilian forest the size of Connecticut in a failed attempt to grow pulp fiber. His costs soared to that level in part because so little fundamental research had been done in the tropics that his foresters and engineers had to experiment as they went along. Had they known at the onset what they discovered so painfully later on, it is unlikely the project would have ever begun. Yet in 1980, just as Ludwig's Jari project was coming to a final crisis, the total funding for global research in the basic biological sciences of ecology, taxonomy and plant exploration was $30 million, less than the cost of a single F-16 fighter.

E.O.Wilson, renowned Harvard biologist, has said that the 20th century will not be remembered for its wars or its technological advances but rather as the era in which men and women stood by and either passively endorsed or actively supported the massive destruction of biological and cultural diversity on the planet. Our prosperity has been purchased at a cost that may well fill our descendants with shame.

Sensitivity to nature is not an innate attribute of indigenous peoples. It is a consequence of adaptive choices that have resulted in the development of highly specialized perceptual skills. But those choices spring from a comprehensive view of nature and the universe in which man and woman are perceived as but elements inextricably linked to the whole. It is another worldview altogether, one in which man stands apart, that threatens the forests and our world with devastation.

Perhaps the greatest gift of the indigenous peoples will be their contribution to a dialogue between these two worldviews such that folk wisdom may temper and guide the inevitable development processes that today ride roughshod over much of the Earth. In an increasingly complex, bloodstained world we need the visions of the indigenous peoples even as we need the wild lands themselves, alive and intact, because they stand apart as symbols of the naked geography of hope.

Wade Davis holds degrees in anthropology and biology and received his Ph.D in ethnobotany from Harvard University. He has worked in the field as a plant explorer and ethnobotanist, investigating fifteen tribal groups in Latin America. Recent work has taken him to Morocco, Borneo, Irian Jaya, Venezuela, and northwest Canada.

Three-toed Sloth *by Brian Evans*

Following the Round River

Measuring Biodiversity and Building Conservation Strategies in the Field

by Jim Tolisano and Jim Sharman

THE VISION OF ROUND RIVER

What is it that brings a sense of wildness to a place? Smells, qualities of light, remoteness, or just innate "feelings" can set our wild places apart from human-impacted landscapes. For most people, a wild place is experienced intuitively. It is an aesthetic perception, unquantifiable, and increasingly difficult to anatomize, largely because our wilderness home has been replaced by a diminishing patchwork of wilderness escapes. Unfortunately, we have also relegated the denizens of these wild places to relatively small, isolated clans. Ensuring the continuation of remaining wild systems may require us, in part, to define in a way that appeases our rational mind those characteristics that blend to reveal truly wild earthscapes.

For millions of years, wilderness was home and there was no separation, physical or spiritual, between inhabitants and place. Urbanization, which isolates us from our sources of food, water, love, and just about every other basis of sustenance, severed this connection, and it has been left for songs, stories, paintings and poetry to reconnect us to our forgotten wild heritage. Gary Snyder writes that "to speak of wilderness is to speak of wholeness." Whole, intact, healthy ecosystems—wild places—are an intimate and indispensable part of the human-earth dynamic.

Biological information, based on the skills of paying attention to place, can enable us to better understand and conserve the quality of wild places, and allow us to differentiate wild lands from managed lands. There is a story to be told about each place we find ourselves, and if we get down on hands and knees and burrow about in the soil a bit we will hear it, and we will be able to share it. The biological sciences are really means for us to define and communicate the intricate details of our feelings for these places, and to enrich the story.

In his classic essay on the Round River, Aldo Leopold recognized the need to bridge ethics, science, and wonder in a manner that will lead to practical, applied regional conservation strategies. In his summary of the meaning of the Round River, Leopold states that, "conservation education must build an ethical underpinning for land economics and a universal curiosity to understand the land mechanism." The Round River is the route back home, the path we follow to remember who we are and where we come from. By journeying into diverse, healthy biological communities, we enact a family reunion that celebrates our birthrite.

Round River Conservation Studies (RRCS) is an ecologically oriented research and educational organization formed to help mobilize this rediscovery. The mission of Round River is to preserve and restore wildness, and to foster and apply the rights of nature. RRCS involves students and local communities in re-

gional projects that aim to preserve and restore wildness, and increase local awareness of, and participation in wildland conservation. Round River students, ranging through all university levels, work in the field with professional guidance to inventory and document biological diversity and the ecological health of a particular ecosystem.

The Round River vision attempts to respect and bridge the differences between the poetic and biological descriptive voices. Round River students compile raw-edged data on parameters that characterize critically important conservation areas.

Based on these scientific analyses, Round River staff and students then work to formulate regional conservation strategies, and influence policies that affect a region's ecological vitality. This requires students to conduct interviews and town meetings to share findings, determine local concerns, and mobilize local individuals and groups to carry forward a conservation vision for the region.

DEVELOPING A WILDERNESS INDEX

In each project area Round River is attempting to combine the "big picture" analysis of bioregional characteristics with the increased magnification of site-specific ecosystem dynamics. This requires us to first define the uncertain boundaries of the "ecosystem." We need a way of delineating our bioregional boundaries in a way that can be understood by everyone. This leads us to the watershed and then the biological community.

Watersheds are easy: all the land area draining water from the highest point to a commonly agreed upon outlet point represents a particular watershed. Water becomes the theme in the watershed, and all other factors (vegetation, soils, wildlife, precipitation, human uses) become characters playing on this theme. Water and soil quality tests become easy means to sample the "blood" of our watershed body. Most people can learn how to delineate and draw their own watershed on the ground in minutes. Having worked with dozens of cultures worldwide, we have not yet encountered a language that does not include a word for *watershed*.

Thus, we can begin by delineating the major watershed boundaries in our bioregional context. Ultimately, however, our goal in a conservation strategy is to ensure that the full complex of biological communities in a region is sufficiently intact so as to provide all original inhabitants with an opportunity to play out their evolutionary potentials. As a next step, we overlay a map of the major biological communities in this region[1] on our base watershed map. Now we know roughly how the biological communities are distributed across the landscape. Overlay onto this a map showing existing undisturbed areas, whether legally protected or not. Although this is usually done quickly by simply mapping remaining roadless areas, the presence of a road should not by itself preclude a potentially important or intact natural community. Place on top of this an overlay of existing or proposed human land uses, and you get a "big picture" of where the more prominent risks to biodiversity are, and where we need immediate measures to begin sewing the fabric of life whole again.[2] Begin to visualize practical corridors to connect all the identified reasonably intact biotic communities and you have the firm outline of a regional conservation vision.

These are good beginnings, but we need to get on the ground and taste the soil if we are to tell the story straight. Once we know our priority biological conservation areas, we need to inventory areas representing particular biological richness or facing worrisome threats.

Soil, site aspect, elevation, and topography influence the dominant life-forms present. Tree height and diameter, canopy density, and abundance of dead and down material characterize the structural diversity of the site. We can describe these characteristics with the tools of the biologist and the watershed ecologist, and the result becomes a clinical homage to our own roots. Round River students move through their days on all fours getting to know the intricacies of the biotic communities around them, and recording their observations on standardized, yet flexible inventory forms. These compiled forms tell us a story of place that allows us to quantify, in the language of the scientist, and qualify, in the voice of the muse, this basis of wildness that our species demands.

Essentially, the inventory methodology asks each student to stop, look, listen, measure, and intuit the factors that have influenced the immediate physical and biological shapes around us. For example, we are in an aspen sub-climax community at an elevation of about 9700 feet in southern Colorado. What sort of slope and aspect are we standing on? (northwest) Describe the soil characteristics (sandy clay loam to the feel, moderate moisture holding capacity, somewhat rich taste, two clear horizons, maybe 11 inches in depth before reaching what appears to be something like a "C", or undifferentiated horizon. Approximately 2-inch depth of ground litter cover, though if a very intense rain sits over this place for a good hour or more, some of this soil is going to move downslope). Based on the age distribution of the overstory aspen trees (fairly uniform), this place was likely the scene of a major disturbance (fire?) about 80 years ago. How diverse is this forest structurally? (substantial dead and down material, estimated at approximately 9000 ft^3/acre; an average of two snags per 1/10 acre plot having an average diameter at breast height of 11 inches, indicating that greater than 400 ft^2 of snag basal area exists per acre; significant variation in tree heights, with greater than 50% canopy cover in average stands).

These biophysical details are complemented by information on keystone species. Keystones are species that strongly influence a large number of other plant or animal species in the community or ecosystem. As we tell our story of this place, keystone species become central characters conveying the conservation message. As we follow these keystone species, we begin to understand the extent and location of conservation needs in each place.

For example, as we wander our southern Colorado aspen community we look steadily for signs of the Grizzly Bear (they're still here, though few in numbers), a highly suitable keystone for this place. More than 20 plant species attractive as Grizzly foods are at our feet. Four bear scats go into baggies for later hair sample and DNA analysis.[3]

MUTUAL AID AND LOCAL OWNERSHIP

Our maps and data sheets frame the story that we bring to the people who live in the bioregion. To have any meaningful hope of conserving the biological richness of this place, we must improve the "management" practices being applied by public agencies and private landhold-

[1] We use a modified version of the biotic community classification system developed by David Brown and Charles Lowe for the American Southwest (see Desert Plants, Vol 4, No. 1-4, 1982). Holdridge's Life Zone Ecology system developed in Central America can also be easily applied to terrestrial biotic communities worldwide (see his text Life Zone Ecology, published by the Tropical Science Center, San Jose, Costa Rica).

[2] Reed Noss presented a more detailed version of the methodology to guide a regional conservation strategy in the *Wild Earth* special issue on The Wildlands Project, pp. 10-25.

ers. Of course, what we must manage is ourselves, and our own behavior in response to this place. Which brings us back to local ethics and attitudes.

Local land ethics may not be immediately evident, but are always present. Unfortunately, they are rarely voiced, so the people holding them may not even know how to express them. We need forums where local people can come together around conservation issues and discover a voice for their own ethics, and overcome their fears of change. Bring out the maps, the data summaries, the vision of what we now have, and what is possible in this place. Then remind ourselves that "wildness" in our place is usually a good indication that our land, water, and air are healthy.

We also must remind ourselves that a "local" is anyone willing to act over time to do whatever is necessary to sustain or enhance a place. Round River recognizes that it is essential for local people to have a voice and a stake in any conservation vision. This requires us to extend our education and research into local communities, and to provide people an opportunity to have input into our field work. The lines drawn on maps must have some sense of local ownership or they will remain only that: lines on a map, and the bears will fade into memory. Curricula for the elementary schools, Bear Talks for the local Chamber of Commerce, interviews in the hardware store, potluck cookouts to discuss a proposed new road: this is where the difference is made.

This does take a bit of courage and care. Many are terrified at the prospect of losing their IRAs, four-wheelers, and cheap gas, and they will clearly sacrifice their children's earth to keep these trinkets. We hear from these people, and their fear can be loud. Fortunately, it has no roots, and doesn't seem to stick well, especially with younger minds. Round River simply speaks steady and strong above this fearful noise, knowing that true locals will emerge with a perspective that speaks for all beings.[4]

THE SAN JUANS CONSERVATION STRATEGY: A CASE STUDY

Round River Conservation Studies is already applying this methodology for measuring, monitoring, and communicating a wildness index for several important centers of biodiversity in North and Central America, and Asia. Round River is now operating five field projects—the San Juans Grizzly Project, the Sky Islands Mexican Wolf Project, the Central American Jaguar Recovery Project, the British Colombia Hidden Rainforest Project, and the La Sals/Canyonlands Predator Ecology Project—with additional projects in the works. However, the methodology is evolving most rapidly in the San Juans.

The San Juans bioregion of southwestern Colorado represents a unique opportunity to create a conservation vision based on the principles of conservation biology. Relatively large, biologically diverse areas still exist here across a landscape with a full representation of biotic communities in various stages of succession.

The RRCS San Juans Grizzly Project aims to sustain the habitat needed to allow a Southwestern population of Grizzly Bears to thrive and expand. Round River has identified a small remnant population of Grizzlies in the San Juan Mountains, where they were believed to be extinct. Unfortunately, initial mapping efforts have shown that existing protected areas represent only a few of the biological communities found in this bioregion. We have been working since 1991 to conduct biological inventories in the southern San Juans, using the Grizzly Bear as a keystone species to help define a meaningful conservation strategy.

Staff and students have mobilized local community efforts to work with government agencies toward improved wildlands management in the region. Round River has conducted several community forums to discuss our field research, the prospects for a remnant Grizzly population, local concepts of wildness, and local ideas for a bioregional conservation strategy. The initial response has been inspiring. Participation in the forums has been very high, with a good cross-section of local perspectives. Many local people seem to recognize that the region is in economic transition from a dependence on multi-national commodity extraction to a more conservation-oriented balance of recreation, local services, and locally-based extraction. The impact has been strong enough to encourage personnel from the Rio Grande National Forest to invite Round River staff to assist in a re-write of the Forest's 10-year management plan along the lines of conservation biology principles and Grizzly management requirements.

Where does this leave us? Always coming back home. In June Round River students and faculty move again into the San Juan watersheds seeking the wild, or at least a message of its presence (some Grizzly shit will do). Old-growth spruce-fir forests, high aspen meadows, wet choke-cherry dominated stream banks, and igneous/metamorphic rock outcrops create a patchwork of different textures on the landscape. The forests are filled with resin-scented air and silver-gray light filtered through the dense canopies. The area resonates with a richness and abundance of life. It feels wild. Scrambling over fallen trees ripe with decay, we pause to fathom this quality of wildness, to hear its song, and to share it. Listen.

Round River Conservation Studies is a non-profit 501 (c)(3) organization that provides field project experience, academic training, and college credit to undergraduate students. Round River makes special efforts to include local students in all of its field projects. Round River can be contacted at 307 West 200 South, Suite 5003, Salt Lake City, Utah, 84101, 801-363-8054, or through POB 9226, Santa Fe, New Mexico, 87504, 505-473-1537.

Jim Tolisano is Round River Conservation Studies's Director of Field Programs, and a consulting ecologist working with conservation projects worldwide. Jim Sharman is RRCS's consulting ecologist, and a notable backcountry cook.

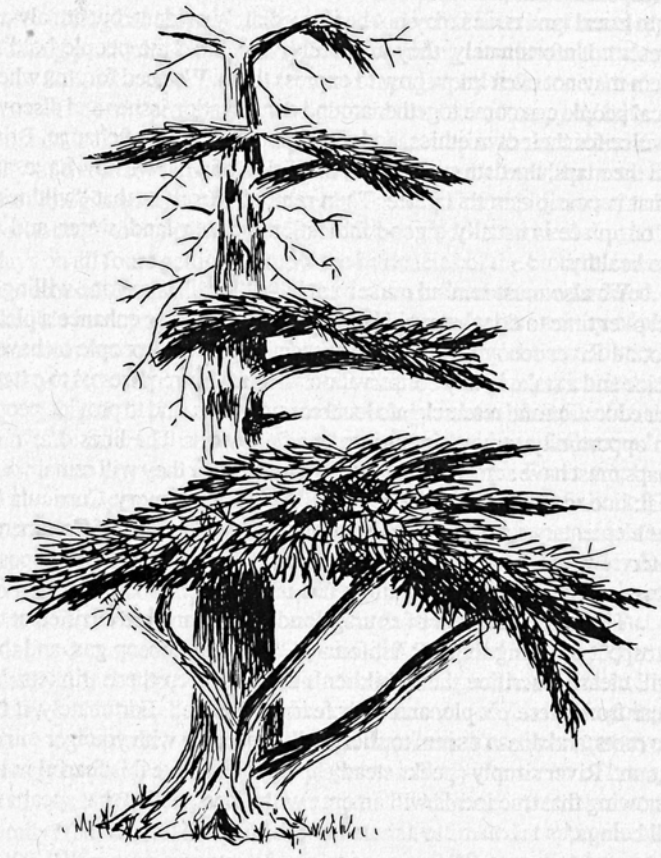
---

[3] In respect for our non-human neighbors, RRCS does not trap, drug, or radio collar wildlife. In following the ethical approach of our Program Chairman, Doug Peacock, who has probably learned more about the Grizzly than any other living human without ever collaring a bear, we use animal sign, habitat analyses, and patient observance to inventory wildlife methodologies. In less than two years this approach has enabled Round River to document the presence of a remnant Grizzly population in southwestern Colorado which had eluded previous traditional research teams for decades.

[4] Interestingly, we have encountered far more enthusiasm from locals on biotic values in the so-called "developing" countries than we have in North America, which suggests that many U.S. people may benefit from therapy for their myopic cultural insularism. People with fewer options at hand are racing past us in terms of conservation accomplishments. Let's learn from these folks.

Native Ecosystems Council

POB 6032, LARAMIE, WYOMING 82070
POB 125, WILLOW CREEK, MONTANA 59760



Native Ecosystems Council (NEC) coalesced last year to advance the protection and restoration of native ecosystems in the West. NEC was incorporated in Montana early in 1992 by Sara Johnson, a PhD wildlife biologist with 14 years of prior Forest Service experience. In November 1992, NEC was joined by Colorado sociologist Sylvia Callaway and three seasoned activists from Wyoming—Don Duerr, Leila Stanfield, and Jeff Kessler (all 1988 co-founders of the Laramie-based Friends of the Bow). Through this merger, NEC established offices in two Rocky Mountain locations and an advocacy base spanning seven Western states.

When pooled, our backgrounds include advanced training in wildlife biology, computer science, botany, physics, engineering, mathematics, teaching, environmental law, resource economics, technical writing, pilot skills, and community organizing. Individuals in the group are able to carry out biological field studies, perform floristic inventories, conduct aerial photo surveys, do computer-assisted image processing and analysis, and give expert testimony.

SCOPE

Our current efforts are directed at the forest and grassland ecosystems in the Rockies, particularly those areas of Montana, Wyoming, Idaho, Colorado, and South Dakota that have been subjected to substantial extractive pressures yet have received little attention from activists. We are also working on a few issues of nation-wide scope.

Since much of the biological diversity in the West is on public lands, and because public resource managers have certain responsibilities to preserve biodiversity, our efforts are directed at influencing the two primary Western land management agencies: the US Forest Service (FS) and the Bureau of Land Management (BLM). Another reason for this focus is that despite their responsibilities, these two agencies often pose the greatest threats to the ecosystems of the West. As needed, we also direct attention at other agencies whose actions impact ecosystems, notably Animal Damage Control (ADC), US Fish and Wildlife Service (FWS), Bureau of Reclamation, and state wildlife agencies.

STRATEGIES

It may seem ironic that while our group is entirely about "native ecosystems," we make no attempt to define what these ecosystems are. This is because in most instances attempting such a definition would be futile. A Swainson's Hawk, for example, which summers on Wyoming's Thunder Basin Grassland, may winter in Argentina. Thus, the native ecosystems we are working to protect have some components far removed from the immediate area in which we work.

To avoid the boundary dilemma, our approach is to determine the species, habitats, and processes that comprise (or historically comprised) the local functioning portions of native ecosystems. By protecting these components, preferably in a holistic way, we protect the local ecosystems.

Different strategies are generally necessary for protecting each component of a given ecosystem. Below, we discuss our basic strategies, and provide examples to clarify how NEC applies them. To summarize, however, NEC uses whatever channels are legally available and necessary to secure protection. If comments won't bring an agency around, we file a petition or an appeal. When administrative channels fail, we litigate. (We are currently involved in 2 lawsuits and are preparing to file 4 more.) If litigation fails, we work to change the law.

Protect and Restore Native Species.

We believe focusing attention on individual species (as opposed to communities) has limited potential for protecting entire ecosystems. Nevertheless, we also believe direct efforts to protect single species are sometimes necessary, for instance, when (1) a species is potentially threatened or endangered but not yet subject to protection under the Endangered Species Act (ESA), or (2) a species is presently un-listable but subject to substantial threats.

(1) A good strategy to protect potentially threatened or endangered yet unlisted species, begins with performing biological status reviews (preferably using the guidelines established by the Biodiversity Legal Foundation) to determine if listing is warranted under the ESA. If warranted, we petition the FWS to list the species and designate Critical Habitat. We are currently initiating status reviews on several species

illustration by Sandy Hogan

known to occur on the Black Hills National Forest (BHNF) in South Dakota (e.g., Black Hills Redbelly Snake). On a related issue, we recently joined several other Rocky Mountain activists in filing a successful notice of intent to sue which compelled the FS Rocky Mountain Regional Office to issue its much-delayed sensitive species list.

(2) The protection of un-listable species subjected to substantial threats requires special strategies. The most notable species in this category are predators like Black Bears, Mountain Lions, and Coyotes. Threats to these species come from ADC lethal predator "control" activities and from hunting. Because of the important niche predators fill in properly functioning ecosystems, and because of the extensive threats to these species, protection of un-listable predators has become one of NEC's major efforts.

The Black Bear is an example of an un-listable species needing protection. NEC has been fighting bear baiting issues in the Rocky Mountains. Baiting disrupts ecosystems by subjecting bears to excessive hunting mortalities, habituating bears (and other species) to unnatural foods, and disrupting normal habitat utilization patterns. Last year, we joined the Fund for Animals in a successful lawsuit forcing the FS to assess the impacts of baiting on Wyoming Black Bear populations, on Grizzly Bears, and on other Endangered, Threatened, and sensitive species. As a result, the FS agreed to prohibit baiting in all Wyoming Grizzly Bear recovery areas and designated Wilderness Areas. We also provided substantial evidence to show that some Wyoming Black Bear populations are presently over-hunted. This helped convince the Wyoming Game and Fish Department to shorten the spring hunting season and initiate a five-year, state-wide study of Black Bear population viability. We are expanding our efforts with the Fund to prohibit bear baiting on all public lands in Wyoming and other states. [see *Predator Death Tolls*, p.16]

In 1992, NEC was involved in successful efforts to prevent an indiscriminate "coyote and fox hunt" on the Missouri National Grassland in North Dakota. This April, NEC filed a petition (on behalf of 18 activist groups from 8 Western states) with the US Council on Environmental Quality (CEQ) seeking to force the Forest Service to develop impact assessments for predator control activities on National Forests.

Finally, we are working to restore extirpated species to their former habitats. For instance, we have asked the FS to reintroduce Pine Marten and Black Bear to their historical ranges in the Black Hills.

Protect and Restore Native Habitats.

Although people rarely think of this, species' habitats often consist of other species. For instance, a certain bird species (say, the Flammulated Owl) may preferentially inhabit a particular tree species (say, Ponderosa Pine). Thus, our efforts to protect species will also protect certain habitat elements. However, habitats also have important non-living components and attributes such as micro-climates, aquatic conditions (stream flow rates, turbidity, dissolved oxygen content, etc.), spatial distribution of vegetation (patch size, connectivity, etc.), and soil characteristics (moisture content, compaction, etc.).

Our strategies for protecting living and non-living habitat components involve all administrative and legal channels. Our most recent appeals of timber sales on the Medicine Bow National Forest (MBNF) in southeast Wyoming exemplify our efforts. In one appeal, we urged the FS to take into account how proposed clearcuts would affect the micro-climate of neighboring uncut fens known to provide habitat for climate-sensitive species (e.g., wood frogs and a rare orchid known as the Clustered Lady's Slipper). In the other, we argued that because of edge effects, the few stands of old growth to be left uncut after the sale would be too small (<100 acres) to serve as effective interior habitat. The agency agreed to drop both sales. In a prior appeal, we argued that the FS failed to consider how a proposed logging road in a roadless area would alter the area's local hydrology from that of a sub-surface sheet flow to a channelized surface flow; this change would cause rare forest wetlands down-slope from the proposed roadbed to dry up. In response, the agency decided to prepare a supplemental EIS and is now reconsidering the proposal.

Protect and Restore Natural Processes.

A native ecosystem cannot be considered functionally complete unless its natural processes are allowed to occur. Natural fire and insect infestation — processes that, among other things, recycle nutrients and create snag habitats — have largely been eliminated on much of the public domain. As snag production processes have been eliminated, snag- and cavity-dependent species have been put at risk. We have been informed that as an indirect consequence of its extensive logging program, the Black Hills NF currently has such low snag densities that the FS is considering creating new snags by girdling live trees and blowing the tops off others with dynamite.

The natural fire regime for the Black Hills Ponderosa Pine forest was one of frequent, low intensity fires which kept the understory cleared of fuels. Nearly a century of fire suppression has altered the forest and allowed substantial ground and ladder fuels to build up. Consequently, if a "no control" policy were implemented there today, even on small portions of the forest, large, catastrophic fires would result. This situation poses one of the greatest threats to the entire Black Hills Ecosystem.

To restore fire to the BHNF, we have proposed a series of fuel reduction projects which, over a decade or two, would reduce the threats and allow a return to the natural regime ("no control"). The return to the low intensity fire regime would also facilitate the creation and maintenance of open canopy old growth (largely depleted) and much needed snag habitat (without resorting to the use of dynamite).

Our strategy for preserving natural processes, then, is to argue for the allowance of these processes when decisions are made on fire management plans, on individual projects such as timber sales proposed to ward off potential insect outbreaks, and on programmatic management plans (Forest Plans and BLM Resource Area Plans).

Holistic Ecosystem Protection and Restoration.

While individual species, habitat, and process concerns can sometimes be successfully resolved at the project-level, we believe the best opportunity to have them addressed — and addressed holistically — is during the development of programmatic land management plans. To put this into perspective, when a Forest Plan is developed or revised, the following issues should be addressed across the entire Forest: species viability; habitat conservation areas; habitat corridors/linkages; size, quality, and distribution of old growth stands; nest buffer sizes (e.g., to protect Northern Goshawk nesting/post-fledgling areas); fire and insect management plans; monitoring plans; grazing allotments; Research Natural Area, Wilderness, and Wild & Scenic River designations; road

density standards; and predator "control."

Both the FS and the BLM have now publicly committed to carry out ecosystem management on the nation's commons. Citizens must be prepared to make the agencies follow through on their promises by pushing the agencies to adopt ecologically-based plans. If an agency refuses to consider conservation biology principles in the formulation of planning alternatives, we develop our own alternative and submit it to the agency for consideration.

Native Ecosystems Council has produced two Forest Plan Alternatives based on conservation biology principles. We have submitted these proposals into the record on South Dakota's Black Hills NF (December 1992) and Wyoming's Medicine Bow NF (February 1993).

Since it may take 2 years to develop a scientifically sound conservation biology alternative, a concerted effort is needed to produce proposals for all forests and grasslands in the Rockies. Therefore, an important part of our strategy is to seek dedicated locals and teach them how to do this work. We are committed to working with citizens throughout the planning process and to educate them about important issues related to public resource management (biology, economics, silviculture, hydrology, etc.); how to conduct field surveys, mapping, and literature searches; federal laws and regulations; how to draft comments and appeals; and how to prepare for litigation.

HOW YOU CAN SUPPORT OUR EFFORTS

At the same time we are reaching out to assist others, we are reaching out for assistance. Most of the efforts discussed in this article were carried out with no funding, and we continue to operate with almost no financial support. Your tax-deductible donation would be greatly appreciated.

NEC also needs computer equipment (work station, scanner, plotter, printer, and software) to set up a geographic information system (GIS) for developing conservation biology proposals. This computer system will also be used to process satellite imagery and to analyze FS resource databases.

Finally, we are always searching for visionary, pro-bono attorneys to help make good case law regarding ecosystem protection. We are capable of drafting complaints, briefs, interrogatories, and declarations. We are also well versed in the Freedom of Information Act and can assist in gathering information needed for litigation. ❦

Get Them By The Grassroots...

by Naomi Rachel

...and their hearts and minds will follow. For years, environmental activists have been claiming that the Share, Wise Use, People For The West and People First groups are fronts for industry, managed and funded by resource extraction interests. Now we have confirmation of these beliefs from an unexpected source: the Canadian government. Robert Skelly, Member of Parliament for a riding on Vancouver Island (which contains some of the most contentious remaining unlogged watersheds and ancient forests, including Clayoquot Sound), commissioned a paper to be prepared by the Research Branch of the Library of parliament.

The report is a sign that things are changing. The concise summation reads: "With respect to B.C. Share Groups, the forest companies have provided these 'local citizens coalitions' with much of their organization impetus and financial backing. Their apparent objective has been to pit labour against environmentalists and environmentally-oriented persons. Their effect has been to divide communities and create animosity in the very places where honest communication and consensus should be encouraged." (In B.C. every disputed piece of ground has a "local" SHARE THIS PIECE OF GROUND group.)

When the NDP (New Democratic Party) was elected to power in British Columbia, they began to re-examine their mandate. They had been elected by both labor (loggers) and environmentalists and they began to see that Share Groups were neither. Share Groups are supported by Ron Arnold and his friends. The Center for the Defense of Free Enterprise and their ilk do not vote NDP. The more power the NDP has federally, the less they will buckle to provincial industry interests.

The Canadian government report is blunt. Ron Arnold is funded by the Unification Church (the Moonies) and "the American Freedom Coalition and CAUSA (Confederation of Associations for the Unification of the Societies of the Americas)." The latter two "were among the principal supporters of the contras in Nicaragua and are backers of the right-wing regimes in South America."

Ron Arnold has been highly visible in Canada (fighting for pesticide use throughout the country and for forest destruction in B.C.) because he thinks the governmental structure is easier to manipulate in Canada than it is in the States. Canada has a weaker federal government (and that is the trend for the future), and provinces have complete power over "crown" land. Arnold's goal is to "create a long term unfinishable agenda and train interns to carry the multiple use philosophy into every corner of Canadian society. It must initiate tactical programs of legislation, litigation and public pressure designed to change every nontimber land use designation in Canada to multiple use within fifty years."

The "SHARE GROUPS IN BRITISH COLUMBIA" report is available: House of Commons: Room 750, Confederation Building, Ottawa, Ontario, Canada K1A OA6.

Information is also available from Ancient Forest Rescue: Box 7566, Boulder, CO 80306. Phone: 303-449-2434.

The Mendocino Environmental Center did an excellent report on the Wise Use Movement in their fall 1992 newsletter. Their address is 106 W. Standley St, Ukiah, CA 95482. Phone: 707-468-1660.

Ancient Forest Rescue Update: Jim Webb is the current supervisor for the Rio Grande National Forest and the newly appointed supervisor for the San Juan National Forest in Colorado. He seems determined to log the very last unprotected roadless, original forest ecosystem in the Rio Grande, TROUT MOUNTAIN. Please phone and tell him you are strongly opposed to the logging of Trout. The Forest Service line is that they won't log any more such areas after Trout. Guess why? This is truly the last one we can save in the Rio Grande. Phone or write today. 719-852-5941; Rio Grande National Forest, 1803 W. Highway 160, Monta Vista, CO 81144 (attn. Planner).

Long-time B.C. activist Naomi Rachel (954 Arroyo Chico, Boulder, CO 80302) now works with Ancient Forest Rescue in Colorado.

The Summit Of Our Discontent

by Victor Rozek

For several years the Native Forest Council has been advocating a Zero-Cut solution for our National Forests, as embodied in the National Forest Protection Acts. As the issue gained attention and the forests fell, what was once thought unreasonable began finding mainstream support. Many environmental groups now openly advocate an end to logging of ancient forests. Will the shift be seen in the results of the forest summit?

Portions of the Zero-Cut solution were suggested: jobs in restorative forestry and aid to timber dependent communities. But its most critical provision—an end to logging on public lands—was omitted.

In February of this year the World Resources Institute published a draft study on the forest crisis, Breaking the Deadlock: Obstacles to Forest Policy Reform. In their Conclusions, WRI made this observation: "It becomes increasingly difficult to say what are practical suggestions, when one's research tends to show that what is politically feasible is usually too minor to make any difference, while changes significant enough to be worthwhile are often unthinkable in practical political terms."

The future of America's forests will depend, in great part, on whether the Clinton Administration can abjure that bleak analysis and produce the politically unthinkable. So far, presidential actions have lagged behind executive rhetoric, and enviros have done little to hold the President's reportedly large feet to the green fire. If our performance at the recent forest summit was any indication, we have, again, set the bar too low.

On a variety of issues, the President has shown that he is nothing if not collapsible. During the presidential campaign, for example, candidate Clinton promised to curtail public-lands abuse by eliminating below-cost timber sales and charging higher fees for grazing and mineral extraction. (*Nearly half of the grazing rights on US public lands are owned by foreign business interests.*) But just two days before the forest summit, the president was visited by a big dose of political reality courtesy of a Western delegation of Democratic senators. It can be surmised that they threatened to withhold support for Clinton's economic package as long as it contained higher fees for their friends—the already-wealthy beneficiaries of public-land abuse. Clinton blinked. The provisions were removed from his economic legislation, and welfare logging, welfare ranching, and welfare mining continue on public lands. The pre-summit message was unmistakable: The forces of extraction are still in control.

Now, as the Administration's plans take shape, it seems likely that a national problem will be "solved" by setting aside a few "significant tracts" of ancient forest west of the Cascades, while permitting industry continued access to the bulk of the National Forests.

That, however, is consistent with what environmentalists asked for at the summit. Enviros reliably fail to grasp that trying to control abuse, as opposed to stopping it, is a fool's errand. Compromising with injustice always gets you more injustice. The analogy is worn and harsh but not without merit: we do not negotiate a rapist's "right" to rape, nor do we negotiate the frequency and duration of rapes, nor do we draw lines around selected neighborhoods and permit rape to continue only within those boundaries.

Mark Dowie, writing in the *World Policy Journal*, urging enviros to kick the compromise habit, said it this way: A healthy environment "should really be regarded as a basic human right...understanding environmental issues as fundamental human rights ultimately renders compromise nearly impossible. Human rights advocates do not generally negotiate half measures ('You may torture 5 percent of your population, a 50 percent reduction from the 10 percent you tortured last year.')"

Yet half measures are exactly what enviros "negotiated" at the summit. It will be a reflection of our hubris and our appetite for public funding when many among us turn compromise into false triumph.

The biggest obstacle to a comprehensive resolution of the forest crisis will not be the well-intended-albeit-quick-to-capitulate Clinton Administration, but the avaricious US Congress. Good intention will continue to be subverted by the financial might of the timber industry and the powerful Japanese lobby which wants unfettered access to US exports. The timber industry and the Japanese want court-proof access to public lands.

"Sufficiency," Alexander Cockburn observed in *The Nation* recently, is a "legal term embodying the corporate ravager's eternal dream of being immune to court challenge." Industry asked for a guaranteed timber supply again and again at the forest summit. Not one enviro had the temerity (or the vision) to suggest to the President that the American public is tired of being ripped-off and that he should quit liquidating public assets at far below their ecological and economic value, and simply kick industry off the public lands. Bob Hattoy one of Clinton's people at the summit, was so appalled at our performance that he ran around exhorting environmentalists to get tough because, in his view, we were being bloodied.

The environmental community had an opportunity to introduce the Zero-Cut solution for all of our National Forests. Portions of the Zero-Cut solution were suggested: jobs in restorative forestry and aid to timber dependent communities. But its most critical provision—an end to logging on public lands—was omitted.

Industry is embracing "salvage" as the newest pretext for getting the cut out. There is a certain symmetry to it. First, industry profits from decades of taxpayer subsidized overcutting. Then the Forest Service, by suppressing fire, and replanting non-native industry-preferred species, drives the forests to the brink of ecological disaster. Now, industry profits by "salvaging" the mess they created and the Forest Service supports them.

Enviros need to knock salvage down before it finds permanent legs in Congress. A Forest Service memo told timber planners in eastern Oregon that "even if a sale is totally green, as long as one board comes off that would qualify as salvage, it should be called salvage. It's a political thing."

Industry has been quick to grasp the implications and the opportunities. *Mother Jones* reports that in California alone, there were over 1100 wildland arson fires in 1992, up 280 from the previous year. If the Forest Service continues to reward arson, then any set-asides resulting from the forest summit will be meaningless.

Zero-Cut. It is simple, easy to grasp, not open to the vicissitudes of industry's interpretation and Forest Service enforcement. The forests do not suffer from a shortage of laws. They suffer from the management practices of federal agencies that hold the law as an inconvenient obstruction in the performance of their duties. Adopting a Zero-Cut solution would eliminate the need for endless scientific stud-

No doubt about it,
not to discount intention
or dedication, but in substance,
enviros weenied-out at the forest summit.

ies (the Forest Service ignores them anyway); for extensive mapping (National Forest boundaries are already clearly mapped); and for creating new Forest Service incentives to cure its addiction to logging (Zero Cut removes access to the object of the addiction).

Zero Cut would end the debate over salvage and "forest health" logging, and save the forests from "New Forestry" (which produces the same stumps as old forestry). Zero Cut would loosen the iron grip of monied special interests whose short-term economic pursuits are incompatible with the long-term health of public forests.

Perhaps Zero Cut's greatest advantage over other proposed solutions is that it requires virtually no enforcement. We've seen the forests fall while waiting for the Forest Service to enforce federal laws. Zero Cut needs no interpretation by regulatory agencies. It would allow no negotiated exemptions; it would not be open to discretionary compliance, or to pressure from timber-captive politicians. It is clear enough for the public to understand and support.

Seperate from the summit, but with a greater potential for disaster, is the "free trade" agenda as embodied in the provisions of NAFTA, the North American Free Trade Agreement. NAFTA, a legacy of the Bush Administration, has the potential to invalidate environmental laws, health and safety regulations, and import/export restrictions judged to be impediments to trade. Under the guise of free trade, big business is lobbying to get virtually unlimited access to the hemisphere's resources.

Under NAFTA, the United States, Mexico, and Canada would each be required to provide the others the same access to their natural resources as they allow their own citizens and domestic industry. NAFTA would usurp a nation's right to control the export of its natural resources. Limiting exports reduces the rate at which forests are logged, and increases the ability of communities to develop sustainable economies. Export limits could be challenged as obstructionist under NAFTA.

No doubt about it, not to discount intention or dedication, but in substance, enviros weenied-out at the forest summit. The government will reward decades of bad management, greed and political corruption: the timber industry will be supplied with more of the object of its addiction; the Forest Service will treat the ailing forests with more disease. Don't worry, they tell us, we can have our forests and cut them too. They call it ecosystem management now. Management, in the end, always equates to killing something. We "manage" bear populations by killing those who dare eat the cambium from saplings planted on clearcut bear habitat. We "manage" wolf populations by killing them so there will be more ungulates which we can then kill for sport. Likewise, we will cut more of our ancient forest, shift the rest of the cut to other regions, and the conservation community will congratulate itself for negotiating another sparkling compromise.

So, what can people do? Join the Native Forest Council (NFC). Help us combat the unholy trinity—the timber industry, Congress, and the US Forest Service. We need to maintain relentless pressure on Congress and the Clinton Administration. Help us make Zero Cut a reality. We need to use the power of intelligently applied media. For example, as bills move through committee, we need to flood the districts of key committee members with information on the forest issue; to mobilize their constituents and pressure these representatives into casting a green vote. The more people that see the clearcuts, and understand the staggering ecological and economic waste, the more pressure we can apply on decision-makers. No one likes to hear it, but winning this battle is going to take funds. Please contribute and raise funds to continue our national media campaign. National Forests belong equally to all Americans, and each of us must demand a voice in their stewardship. Sponsor a 30 second TV spot, or a series of spots, in your area. Sponsor a half-page ad in your local paper. (Call us for details.) Organize a letter writing campaign or phone bank. Flood the Administration and your representatives with letters and calls demanding total protection for all National Forests. Do it once a week. Get like-minded people in your community involved. Speak at schools, retirement communities. People quickly grasp the issue once they see the pictures of the devastation. Distribute NFC's *Forest Voice*; sponsor a mailing to Congress. Join a local environmental group.

The fight is not over. The forest summit was a long-overdue beginning. It appears that it may provide us with an ancient-forest preserve beachhead. We salute the activists who bled to establish it, are grateful to those in the Administration who made it possible, but vow not to be appeased by half a loaf.

Victor Rozek is a Northwest forest defender who works equally hard for forests across the country. He edits NFC's newspaper Forest Voice.

RELEVANT ADDRESSES

- Native Forest Council, POB 2171, Eugene, OR 97402; (503)688-2600
- US Senate, Washington, DC 20510
- US House of Representatives, Washington, DC 20515
- President Bill Clinton and Vice President Al Gore, The White House, 1600 Pennsylvania Ave., Washington, DC 20001
- Katie McGinty, Washington Representative, Office of Environmental Policy, Old Executive Building, Rm 360, Washington, DC 20510
- Secretary Mike Espy, USDA, 14th & Independence, Washington, DC 20250

EPILOGUE:

As of this writing (June 23,1993), we have no "final solution" for Northwest forests, but the Administration has leaked its proposal. To put it in context: After five decades of destructive and corrupt mismanagement, overcutting, the squandering of billions of taxpayer dollars, and outright theft of public property, Clinton promised that his "solution" would be "scientifically sound and legally responsible."

He impaneled scientists to develop the specifics of his proposal. They developed eight options. But when it became apparent that none of the options would allow sufficient logging to please the timber industry, the Administration requested an eleventh-hour addition. Option 9 purports to do the following: Lower the cut level to an average of 1.2 billion board feet over the next 10 years—that's about one-third of the feeding-frenzy level of the late 80's. That total, however, doesn't include unlimited salvage logging and arson.

It sets up "reserves" primarily in watersheds, but then allows "selected" logging in them. It also sets aside tracts of 100,000 acres or more for "New Forestry" experiments, which produce the same stumps as old forestry. The plan only gives the Spotted Owl a 50-50 chance of survival. As such, it violates any number of existing laws and would have to be approved by Congress as the "new law of the land" to override injunctions. If you listen carefully, you can almost hear the baby screaming as it's cut in half again. —*Victor Rozek*

Charting The Way To Topophilia

Using Maps to Promote The Wildlands Project

by Keith Warner

The Columbia River Basin is the largest watershed on the West Coast of this hemisphere, draining an area the size of France. Because it drains parts of seven states and one Canadian province, it falls through the cracks of environmental regulation. NorthWest Environmental Advocates (NWEA), a regional organization based in Portland Oregon promoting water quality and aquatic habitat protection in the Columbia River Basin, has created an environmental education map describing the problems facing the aquatic wildlife in the region. The map was conceived to reach out to and inform the public about the environmental problems and to advocate for regulatory reform among regional political and bureaucratic officials. This article will describe the map and suggest strategies for using maps with The Wildlands Project.

WHY MAPS ARE USEFUL

The genius of The Wildlands Project is that it relies on diverse regional environmental leaders, who are familiar with the ecological and political landscapes of their areas. What most such leaders lack is an ability to communicate widely the scope of the environmental problems in their particular region. Anyone working with The Wildlands Project would do well to produce a map to show the boundaries of their region of interest and portray a plan for habitat protection. The investment is substantial, but a well designed map can serve an organization's mission and help define its focus for years.

Maps have many advantages as environmental education tools over strictly verbal methods. Maps locate human impacts on a region much more clearly than written descriptions. Maps communicate the proximity of environmental problems. Most people enjoy looking at maps and acquire geographic knowledge reading them. Sadly, few people can identify the boundaries of the watershed where they live. Environmental organizations need to confront this geographic illiteracy head-on if they want to involve their region's residents. Most Portland residents are surprised to learn the Columbia River Basin extends to British Columbia and Wyoming.

A map can invite readers to begin to look at their region in a new, more biocentric way. Thoughtful mapping will help residents realize their interdependence with their natural environment, and that is the beginning of topophilia (love of place).

MAPPING THE COLUMBIA

After preliminary research, we decided the most important issues to communicate with "Columbia River—Troubled Waters": the location of the 211 dams in the basin, the destruction of anadromous fish and riparian habitat, the sources of toxic and radioactive pollution, and the general distribution of nonpoint source pollution (agriculture, mining and forestry together probably injure more aquatic life than point source pollution in the basin). The map is bordered by sidebars describing these various threats. Problems specific to each sub-watershed of the basin are also explained. An inset map locates the roughly 30% of the basin historically used by spawning fish but now severed by the dams without fish ladders. The inset also shows the highway route taken by 20 million salmon fingerlings as they are trucked around the eight lower dams on the Columbia and Snake Rivers, trucked because their natural migration paths are blocked by 250 miles of slackwater reservoirs (taxpayers shell out millions of dollars to perpetuate this mockery of nature's wisdom). At the end of each sidebar is a paragraph proposing actions that public agencies and political leaders can take to correct the problems.

The reverse side features a larger-scale map of the 146 miles of the Lower Columbia River. In addition to locating every major polluter and toxic site threatening the river, it shows the wetlands lost to diking and filling. Much critical habitat between Astoria and Bonneville Dam has been dredged and filled by the Army Corps of Engineers. By comparing current and 100-year-old Corps maps, we were able to map habitat losses along the Lower Columbia. Sidebars on this side of the map cover pulp, paper and dioxin, and give a description of the estuary, a pollution glossary, and suggestions for citizen activists.

TIPS FOR USING MAPS AS TOOLS

Production of a map like this should balance two goals: presenting attractive poster art that inspires topophilia, and publicizing the imperiled status of nature. These needs can conflict. Resist the temptation to include every detail on a map. Maps, by definition, present selective details; do not overwhelm your audience.

Employ a trained cartographer to design and produce the map com-

ponent of a project like this. Graphic artists are trained in many things, but the skills specific to cartography are not often among them.

Break up text with illustrations and photographs. A well designed map should pique the interest of someone at first glance. Although they entail a higher investment, good graphic designs get on walls, and this should be our aim, because maps communicate very little when rolled up in tubes.

Feedback from previously produced environmental education materials prompted us to write an italicized paragraph at the end of each sidebar suggesting solutions to the problems described. When presented with the enormity of our environmental problems, people tend to retreat into denial and fear. An outreach effort like this can backfire if it frustrates more people than it engages. Ideally, the information on a map will prompt people to make lifestyle changes and advocate protection of nature.

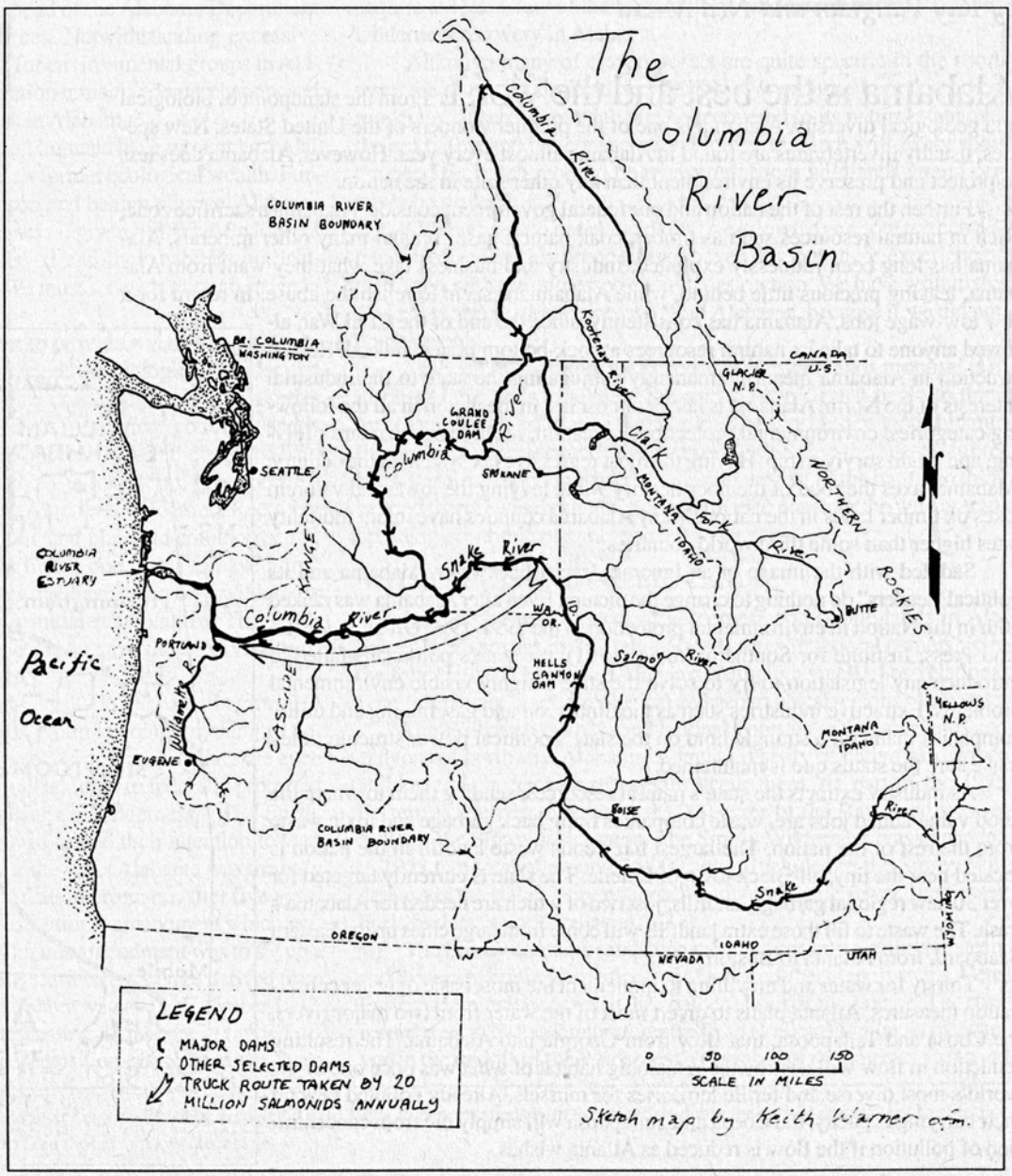
Based on our previous experience producing a map (of Portland-area waterways, locating and describing pollution threats and raw sewage discharge pipes), we knew that the investment in full size (26"x39") and full color paper was necessary to attract the kind of public interest we wanted. NWEA sold nearly 5000 copies of the Portland map at $3 each in the first year, virtually recouping printing expenses. Securing a regional corporate sponsor, even though morally troubling, can add a certain respectability to the research efforts in the eyes of the public. A retail sponsor can help with marketing the map as well.

Surprisingly, agency workers are anxious to see these maps. Government bureaucracy fosters myopia and resists revealing the breadth of the ecological crisis on one piece of paper. Maps communicate cumulative multiple impacts. The education of government employees is in everyone's best interest.

Maps can also enhance cooperation within the new conservation movement. Other regional environmental organizations provided materials for our research, and they are becoming natural partners in distributing this map and networking on regional issues. Groups conceived only to save a small piece of real estate have their vision enlarged by such a map. Projects like this provided focus for regional conservation efforts.

"Columbia River—Troubled Waters," $6 postage paid, can be ordered from NorthWest Environmental Advocates, 133 SW Second Ave #302, Portland, OR 97204. 1-800-598-2936.

Keith Warner ofm (2300 Garden St., Santa Barbara CA 93105), after planting half a million trees for the FS, Weyerhaeuser, and other deforesters, became a Franciscan Friar. He hopes to promote a mature spirituality in the environmental movement and bring ecological wisdom to religious circles.



Protecting Alabama Wildlands

A 50-Year Plan—Under the Aegis of The Wildlands Project

by Ray Vaughan and Ned Mudd

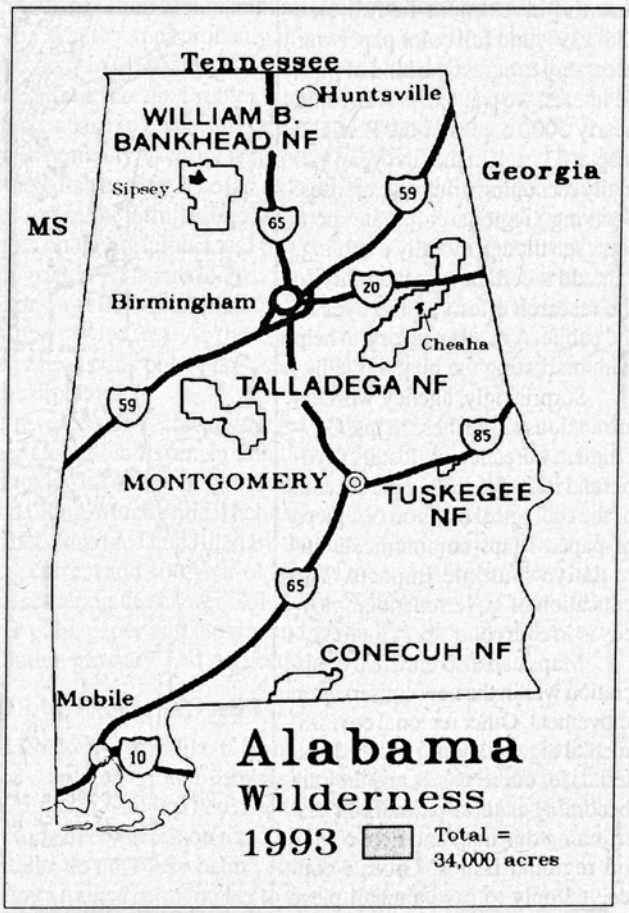
Alabama is the best and the worst. From the standpoint of biological and geological diversity, Alabama is one of the premier wonders of the United States. New species, usually invertebrates are found in Alabama almost every year. However, Alabama does less to protect and preserve its environment than any other state in the nation.

Further, the rest of the nation and our federal government consider Alabama a sacrifice zone. Rich in natural resources such as timber, coal, natural gas, iron and many other minerals, Alabama has long been ruthlessly exploited. Industry and business take what they want from Alabama, leaving precious little behind, while Alabamians seem to relish the abuse. In return for a few low-wage jobs, Alabama has consistently, since the end of the Civil War, allowed anyone to take its natural resources at rock-bottom prices. Indeed, Reconstruction in Alabama meant permanently subjugating the state to the industrial interests of the North. Alabama is last or almost last in the nation in all the following categories: environmental protection, education, health care, standard of living, and infant survivorship. Having the most regressive tax system in the country, Alabama taxes the food of the poor heavily while levying the lowest ad valorem taxes on timber lands in the nation. Many Alabama counties have infant mortality rates higher than some third world countries.

Saddled with the image of an ignorant, racist backwater, Alabama and its political "leaders" do nothing to change the picture. Even after Alabama was ranked 50th in the Nation in environmental protection in the *1991-1992 Green Index* (Island Press, Institute for Southern Studies 1991), the state's politicians failed to introduce any legislation to try to solve the state's highly visible environmental problems. Extractive industries such as the timber, oil and gas, mining and utility companies maintain a strangle hold on the state's political power structure; they make sure the status quo is maintained.

As industry extracts the state's natural resources, sending them to where the good value-added jobs are, waste companies bring back garbage and toxic waste from the rest of the nation. The largest hazardous waste landfill in the nation is located near the tiny, all-Black town of Emelle. The state is currently targeted for over 30 new regional garbage landfills, just two of which are needed for Alabama's trash. The waste to fill those extra landfills will come from large cities up the Eastern Seaboard, from Atlanta to Boston.

Thirsty for water and unwilling to implement the most basic of water conservation measures, Atlanta plans to divert most of the water from two major rivers, the Coosa and Tallapoosa, that flow from Georgia into Alabama. The resulting reduction in flow will destroy the remaining habjtat of what was once one of the world's most diverse and fertile territories for mussels. Already polluted beyond their carrying capacity, the Coosa and Tallapoosa will simply die from concentration of pollution if the flow is reduced as Atlanta wishes.



Despite its relatively small size, Alabama has the second most miles of waterways in the country and, according to new studies,* has more fish species (fresh and salt water combined) than any other state. The quality of all that water and its incredible biodiversity is in the hands of the Alabama Department of Environmental Management (ADEM). ADEM generally sets the most lenient water quality standards in the United States; with the United States Environmental Protection Agency (EPA), ADEM turns a blind eye to Alabama's biological decline. Most of the state's rivers and streams have never been tested to see if water quality meets even the state's lax standards.

As for protected wildlands, Alabama has two tiny designated Wilderness Areas in its National Forests. Out of a total area of 660,000 acres of National Forest in Alabama, Congress has seen fit to preserve only about 34,000 acres. Alabama has no statutory or regulatory equivalent to the federal Wilderness Act; state lands, of which there are very few, are managed at the whim of the head of the Alabama Department of Conservation and Natural Resources. Notwithstanding excessive compromise on the part of what pass for environmental groups in Alabama, the state's congressional delegation remains adamantly opposed to designating any further Wilderness in Alabama.

Despite the incredible devastation humans have wrought on Alabama, many pieces remain of the state's former ecological wealth. Further, due to its fantastic growing season and benign climate, Alabama could regenerate much of its lost richness if given a chance. So long as her unique species are not extinguished and their habitats not lost, Alabama's ecosystems can recover. We must set aside enough space in time to allow them to do so.

That is the purpose of this paper: to provide a vision and a workable but flexible plan for restoring much of the biological wonder and wilderness that was Alabama. This effort is one of the first in a series that will eventually include the entire North American continent and is sponsored by The Wildlands Project. Publishing under the aegis of *Wild Earth* magazine, The Wildlands Project is a long-term, grassroots effort to prepare and implement a North American Wilderness Recovery Strategy. According to ancient wisdom, and plain old common sense, one should take on the hardest tasks first if one wants to have a true and lasting impact on the world. Thus, we have taken on a wilderness recovery strategy for Alabama as the initial state plan for The Wildlands Project. If we can motivate people to save the biodiversity of Alabama, then we can do so anywhere.

The situation for wildlands and wildlife in Alabama is grim. No major national or state environmental group is doing anything to advance wilderness protection in Alabama. No politician in the state even thinks of the issue. After getting a small addition to federally protected Wilderness in 1988 (see "Compromising the Wilderness," *Wild Earth*, Winter 1991/92), environmental groups turned their attention toward getting a land acquisition program for the state. Alabama was the only state in the region without a land acquisition program. After five years of delay, the Legislature passed a constitutional amendment which was sent to the voters. Called Forever Wild, this amendment was to set up a land acquisition program funded by royalty interest monies derived from natural gas production in Alabama's offshore waters. In November 1992, voters approved the program with a startling 82 percent in favor. Forever Wild is the smallest state land acquisition program in the Deep South (of course), but it beats nothing.

As currently planned, Forever Wild will not come close to acquiring the lands we suggest in this proposal. The program will receive no more than $15 million a year (the first year only $2 million) and is slated to last only 20 years; unless expanded, it will acquire no more than 250,000 acres. Some county land acquisition programs in Florida have spent over $100 million per year, and the State of Florida spends more than $300 million per year in addition to the various county programs.

Forever Wild is not intended to be a coordinated effort at protecting intact ecosystems. Indeed, thanks to industry's involvement on the program's board, much of the land bought through Forever Wild will probably be hunting lands purchased from a few timber and power interests that have vast land holdings in the state and want to make a little extra cash at taxpayer expense. Nonetheless, those who care about Alabama's wildlands should try to help Forever Wild set priorities to acquire at least a few of the fragments of wild land for true, long-term wilderness recovery in Alabama.

Although many of our proposals are quite specific in the short-term, we must remain fluid and flexible. We propose here that a very moderate 20 percent of Alabama be recovered to its natural state over the next 50 years, but conservation biology research will likely show the need for much more to be recovered. More wildlands would certainly be preferable.

Although we do not claim definitive knowledge about the ecosystems involved in this proposal, we have been out there experiencing them, and we have witnessed enough destruction. We have written this 50-year proposal, this vision of a Wild Alabama, because if we did not, no one would.

As much as anything, the purpose of our wildlands proposal is to inspire Alabamians to take up the cause. People must begin to think truly long-term and to envision the kind of world they would like to live in, even if they cannot live long enough to see the successful results. It is time for people in Alabama and the rest of the nation to think beyond themselves, both in space and time, to consider the wild as transcending economic parameters.

WILDERNESS AND PUBLIC LANDS

Here is the current state of wilderness and public lands in Alabama. There are approximately 660,000 acres in federal ownership in the four National Forests in Alabama. Although small, those National Forests represent diverse ecological and geographical regions of the state.

The William B. Bankhead National Forest is in the tablelands and canyons of northwest Alabama. A great diversity of native hardwoods and endemic species or subspecies occur there. As part of the 1975 Eastern Wilderness Act, about 13,000 acres of the Bankhead was set aside as the Sipsey Wilderness. The Sipsey Wilderness was expanded in 1988 to a total of around 26,000 acres. Included in the Sipsey Wilderness is the state's only national Wild and Scenic River, the Sipsey Fork, and its major tributaries.

The Sipsey contains sandstone canyons cut into a rolling plateau, and these canyons hold microcosms of more northerly ecosystems. Here, Eastern Hemlock trees reach the southern limit of their range. The state record tree, a 22-foot circumference Tulip (Yellow) Poplar, is in a canyon in the middle of the Wilderness. A number of rare species are found

* The official survey of Alabama fishes and their ranges will not be completed until 1996. In conversations with the scientists doing the survey, the authors learned that the number of species already identified exceed those from any other state.

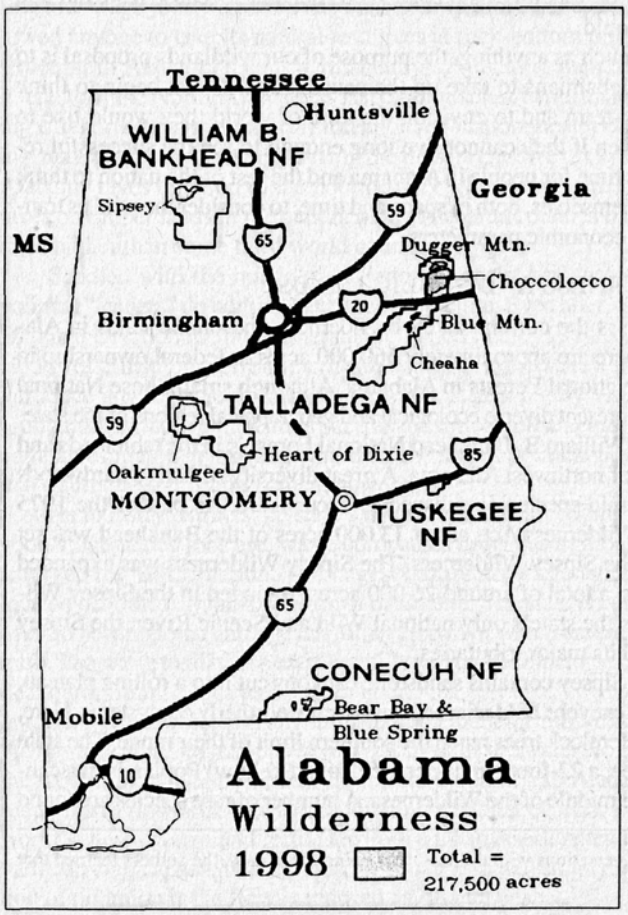
in the Sipsey including the Flattened Musk Turtle (*Sternotherus minor depressus*), which is endemic to Alabama, and the rare fern *Thelypteris pilosa*.

The Talladega National Forest is divided into two parts, in east-central and west-central Alabama. The Oakmulgee Ranger District is the western portion of the Talladega below Tuscaloosa. It contains a unique area of rolling hills with the closest thing Alabama has to extensive old pine forests. It supports the state's highest population of the Red-cockaded Woodpecker (*Picoides borealis*), an Endangered species, with over 130 active colonies.

The eastern portion of the Talladega, is mountainous. The state's other designated Wilderness, Cheaha at 7800 acres, is located here along the highest ridge in Alabama. The state's actual high point is Mount Cheaha, immediately north of the Wilderness Area in heavily-developed Cheaha State Park. This section of the Talladega provides a number of immediate wilderness candidate areas such as Blue Mountain north of Cheaha State Park, Choccolocco, and Dugger Mountain.

The Tuskegee National Forest is one of the nation's smallest, but it is quite lovely (the parts that are not clearcut) and was the site of some of naturalist William Bartram's travels through Alabama in the late 1700s. This area has mostly pine uplands with hardwood bottoms along the streams.

The Conecuh National Forest sits on the Florida border and contains wonderful examples of Southern Coastal Plain Pine Forest, pitcher plant bogs, and hardwood swamps ("bays" in the local vernacular). Although heavily fragmented now, it could recover if protected. Wilderness designation for fragmented areas has occurred in other states in the South (such as Black Creek in DeSoto National Forest in Mississippi). The unique characteristics of the Conecuh deserve protection from all logging, mining and cattle grazing.



Due to legislation in 1992, the National Park Service will begin acquiring land around Little River Canyon on Lookout Mountain in the northeast corner of the state. Most of this land is already part of DeSoto State Park; the rest is owned by Alabama Power Company. A small, 14,000-acre National Preserve will be established here, and although some of the area will be left alone, much of it will be developed for tourists. Nonetheless, Little River Canyon—the deepest east of the Mississippi—is a rare geological area with an essentially unpolluted river running through it. It can form the core of an area of wildlands that, over the next 50 years, would protect much of Lookout Mountain and the hardwood forests along the mountain's flanks. (Lookout Mountain is actually a long, flat-topped plateau.)

Alabama has a few small National Wildlife Refuges. The largest is Wheeler National Wildlife Refuge at around 33,000 acres, located on the Tennessee River. Although it is heavily impacted by industrial activity along the river, the Refuge could form a link between the Bankhead Forest and Tennessee wildlands. Other Refuges include the Choctaw on the Tombigbee River and Bon Secour along the coast. Bon Secour will form the nexus for preservation of coastal dunes, marshes and forests along the Alabama coast. The Alabama Beach Mouse lives only in the dunes of Baldwin County, Alabama. Its main remaining habitats are currently protected in Bon Secour. The US Fish and Wildlife Service is currently acquiring land along the Alabama-Mississippi border to form the Grand Bay National Wildlife Refuge in the marsh lands between Interstate 10 and the coast. Once protected, this area will play a major role in linking the protected coastal wildlands of Alabama with those in Mississippi.

The State of Alabama operates only a small state park system. Still, some of these parks contain strategic lands. Of particular interest are Oak Mountain State Park (10,000 acres), just south of Birmingham; DeSoto SP (now mostly being converted to federal ownership); and Gulf SP (6000 acres).

Gulf State Park has over 1000 acres protected. The area contains some of the last old-growth coastal pine forest anywhere along the entire Gulf of Mexico. Red-cockaded Woodpeckers live within sight of the waves. The lands in Gulf SP are crucial in their own right and essential to connecting coastal wildlands of Alabama and Mississippi with those in Florida.

The State also owns land around Weeks Bay, a vital natural area on the lower eastern shore of Mobile Bay that has been designated the Weeks Bay National Estuarine Reserve. This estuary is important for fish and birds.

The State also owns other lands in the Mobile/Tensaw Rivers Delta above Mobile. This 250,000+ acre area is the nation's largest inland delta, filled with virgin old-growth cypress and hardwood swamps. Currently, most of this area is owned by large timber companies intent on clearcutting it as fast as they can. The Coastal Land Trust and the State have made some effort to buy and preserve land in the southern part of the delta, but the entire area should be acquired and preserved in short order. Over the next 50 years, the damaged areas could largely recover with the help of the remaining natural tracts. Another 15 years of cutting would kill this incredible place. So unique is the delta that it has its own endemic species, such as the Alabama Red-bellied Turtle (*Pseudemys alabamensis*).

Although there are other small tracts of state and federal land that we have not covered here, these are the major areas that will form the core of an Alabama wildlands strategy. Small in comparison to publicly-owned lands in many states, these areas are nonetheless strategically placed around Alabama and can preserve much of the unique diversity of the state with little more effort than keeping them intact.

PLAN FOR THE NEXT 50 YEARS

Our 50-year wildlands recovery strategy for Alabama involves three major parts: (1) Wilderness designation for key National Forest lands within the next five years; (2) preservation of all federal lands in Alabama through elimination of logging, mining and grazing within 15 years, and (3) acquisition and preservation of other key areas and connecting wildlife corridors over the next 50 years. This plan is not designed to be accomplished in a rigid fashion. Future contingencies may mandate different approaches and time tables for protecting Alabama wildlands.

1998: By 1998, it is vital to have as much of the state's National Forest land as possible protected by Wilderness designation. We recommend increasing the protected lands from 34,000 acres at present to 217,500 acres within five years. We recognize that current Alabama politics make this five-year goal unlikely, but if we want wilderness, then we must change Alabama politics. If Alabama were to elect just one US senator sensitive to the state's long-term environmental health, passage of a comprehensive Alabama National Forest Wilderness package could occur with a favorable administration in the White House.

The areas that we recommend receive immediate wilderness designation are:

Area	**Forest**	**Size** (in acres)
Sispey Addition	Bankhead	16,000
Dugger Mountain	Talladega	10,000
Choccolocco	Talladega	55,000
Blue Mountain	Talladega	7500
Oakmulgee	Talladega	72,000
Heart of Dixie	Talladega	10,000
Bear Bay	Conecuh	5000
Blue Spring	Conecuh	8000

All of the acreages are approximate; definite setting of boundaries may change the numbers somewhat. This package will protect a wide range of ecosystems without any requirement of land acquisition or of significant public expenditure. In fact, since many National Forest timber sales in Alabama lose money, designation of these lands as Wilderness should save the taxpayers money.

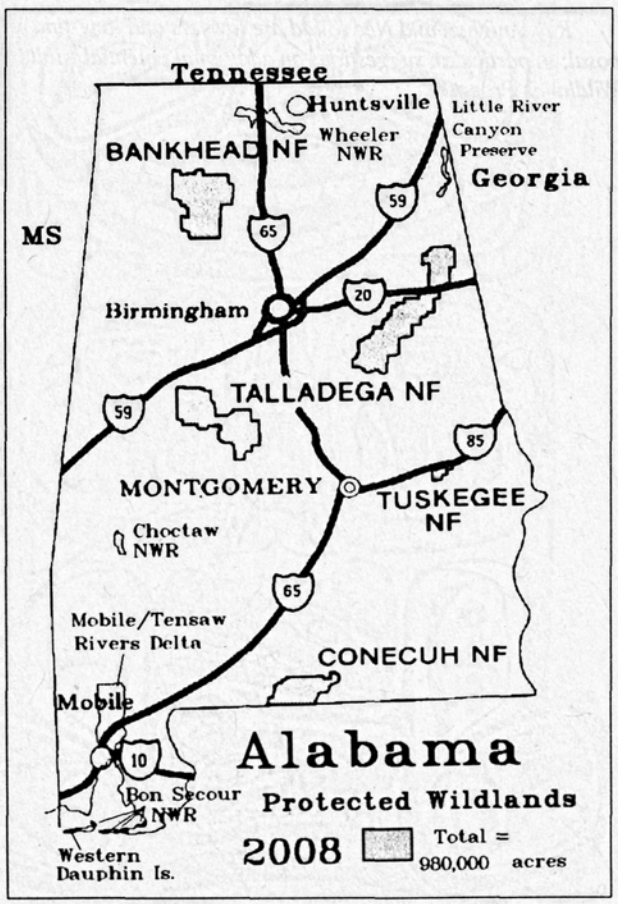
2008: Over the next 15 years, we recommend all federal lands in Alabama be preserved in their natural state. Legislation must ban all destructive practices on federal lands, including timber harvesting (by any method), mining, livestock grazing and construction of permanent structures. This should apply to National Forest, National Wildlife Refuge, and National Preserve lands. Although current roads and buildings might remain, no new ones would be built. Damaged lands would be allowed to grow back into a natural condition.

Other action required over the next 15 years is the purchase of the Mobile/Tensaw Rivers Delta. At least 250,000 acres must be acquired and preserved as Wilderness by the year 2008.

Another large tract that must be acquired by 2008 is the western portion of Dauphin Island. This section of barrier island is still undeveloped, but is currently in private ownership and receives heavy off-road vehicle use which is preventing the area from building an adequate dune system. Just to the west of Dauphin Island, in Mississippi, is the designated Wilderness portion of Gulf Islands National Seashore, consisting of East Ship, Horn and Petit Bois Islands. Adding western Dauphin Island to this current Wilderness Area will be an easy administrative task.

2043: Looking 50 years hence, we imagine having at least ten percent of Alabama, a little over 3,000,000 acres, preserved as wildlands with an additional ten percent protected as buffer zones. These lands would consist of the core areas already protected by the year 2008, linked by wildlife corridors over some of the more important lands and along some of the more important rivers. The buffer zones would be surrounding private lands where compatible human activities would be allowed but all destructive uses inconsistent with preservation of the core areas prohibited. Because we cannot yet be sure what lands it would be politically feasible to include in buffer zones, we have not mapped those zones, but broad transition zones around the core wildland areas are essential.

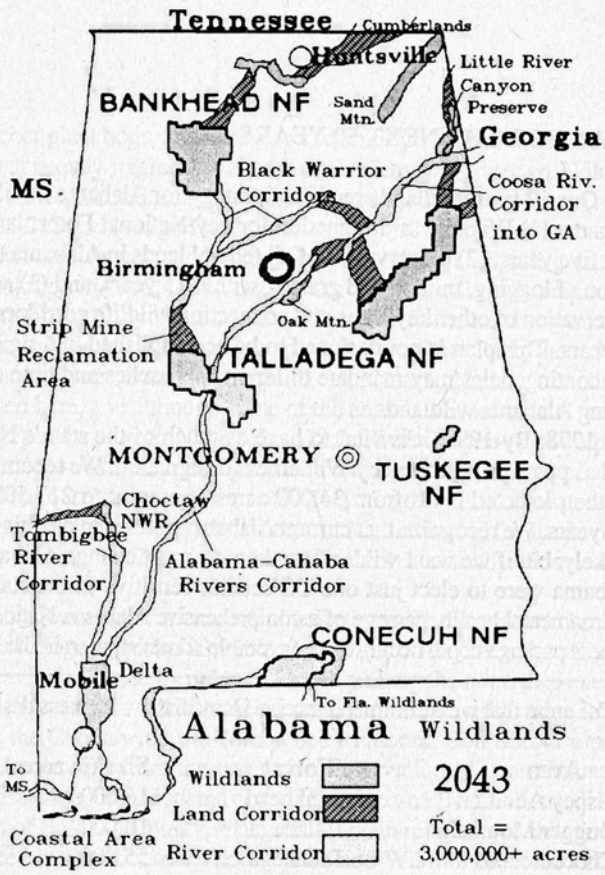
The most important corridor to acquire is the entire Cahaba River system. Currently free-flowing, the Cahaba is the most biologically diverse river of its size in North America, and new species are found in it almost every year. Scientists have identified over 130 species of fish in the Cahaba River, some of which live only there. However, the Cahaba remains unprotected and is used by the City and industries of Birmingham (Alabama's largest metropolitan area) as an open sewer. Powerful business interests have successfully defeated all attempts to give the Cahaba any meaningful protection. Acquisition and protection of the Cahaba must be the first priority in corridor protection, occurring prior to 2008 if possible. Loss of the Cahaba, which at this point seems almost inevitable, may be Alabama's worst aquatic catastrophe to come.



The map of 2043 shows some of the other areas that need to be acquired and preserved. These include additional lands around the Conecuh National Forest, additional coastal lands, the forests along the Perdido River (on the Florida border) and major portions of Sand Mountain. Purchase plans in this time frame must be flexible and responsive to the growing knowledge of Alabama ecosystems and species. What lands most need special protection will be best identified over the long term. However, the ultimate goal does not change over time: we must acquire and preserve enough land in Alabama to ensure the viability of all of Alabama's ecosystems and species.

The cost of such a land acquisition program, over the 50-year time frame, will be tiny, especially when compared to other things that Alabamians and Americans spend money on today. The Forever Wild program will buy about 250,000 acres. Thus, over 1,000,000 acres of our proposal will already be in public ownership under current management plans, and only about 2,000,000 additional acres will need to be purchased. Buying large tracts, one can get remote, undeveloped Alabama land for around $500 per acre. To acquire 2,000,000 acres of remote, undeveloped Alabama land today would cost approximately about $1,000,000,000 (one billion dollars)—about the cost of one B2 bomber.

For the present-day cost of a single B2 bomber, the public could acquire all the lands we recommend preserving right now. Over the span of 50 years, the cost to acquire these lands will be virtually unnoticeable— only $20 million a year—if we plan ahead. If the Forever Wild program were given continuous funding at its present maximum level over the next 50 years instead of over just the next 20, it alone could acquire most of these lands.



Ray Vaughan and Ned Mudd are lawyers and long-time wilderness advocates in Alabama. Wild Earth *invites comments on this Alabama proposal; in particular, suggestions on additional potential wildlands to include, as we intend to publish Ray and Ned's lengthier version in a Southeast Wildlands Proposal.*

Wild Hyacinth (Camassia scilloides) by Gary Eldred

Incorporating Bear

by David Clarke Burks

PLACING

Acquiring ecological wisdom is an undertaking bound up with place. It grows with understanding that habitat *in-forms*. Knowing who we are is embedded in the soil of where we are. Ecology is household knowledge; knowing from where and from whom the honey comes.

Bear, especially for people of the northern hemisphere, has served over millennia as guide and talisman in the on-going search for Earth wisdom. Bear is connected, is integral. Bear knowledge can help us, as it did our ancestors, connect with the voice of the Earth. Inhabiting place is knowing one's *Bear-ings*. Step in the tracks, not on the cracks. Follow all trails to the source.

Language, its origins and structures, is the story of a crossing into consciousness. Language is landscape-mapping in the mind through linkages of symbols connected at their roots. Following the pawprints of *Bear*, humankind throughout history has attempted to map these connections. Using ritual, ceremony, and science we continue to forge an understanding of our place in communities and ecosystems.

From a study of some of the earliest languages we learn that being in place is being one with the Earth. The Sanskrit word for Earth is *bhu*, a noun, which means the place of being; *bhumi* signifies a particular location, ground, land or place. The verb stem, also *bhu*, means coming into being, or taking place. Being in place is coming into being.

From this ancient Indo-European Sanskrit root, Anglo Saxons developed the word *beom* which signified a condition of beingness; I am. It is from the Anglo-Saxon that our English verb *to be* derives. Related, is the Teutonic stem word *ber*, which became the German *bar*, which is the origin of the word *Bear* in English. Being in place is *Bearing* that place; putting on the robes of *Bear*.

Bear, Earth, being and place are interrelated in an ecology of consciousness which mirrors the web of Nature. *Bear* is a link to place, and place reveals being, the very ground of deep understanding. Standing under the constellations of the *Great Bear*, Ursa Major and Ursa Minor, the former known in Sanskrit as *rakh*, or "the bright," humankind relentlessly pursues the polestar of understanding. The more we search the heavens and Earth the more we come to understand that all paths lead home.

Bear by P. Rachael Burks

Ursa Major and Ursa Minor are known in Navajo creation myth as Revolving Male and Revolving Female. We learn from Ray Williamson in Living the Sky, that "...the Navajo know it is time to plant when the constellation Revolving Male lies parallel to the horizon in early evening (late May or early June). In the spring, he is overhead; when he 'slants down to the east, it is winter.' The position of Revolving Male also indicates...when different animals are likely to mate, and when they will *Bear* offspring." *Bear* knowledge, like an aspen shoot, is connection to a vast network of roots.

Bear inhabits the wild. It is the wild that *homes* original knowledge. Going home is going wild and getting acquainted with roots and berries. In the preservation of wildness we acknowledge the complex, generative forces that brought about our habitat. The work to be done is forest work, is mountain work, is coastal work, is the work of digging in. Working in place is performing original knowledge. As Gary Snyder writes, "Wildness is the state of complete awareness."

Chaos, collision, accident and design have all been at work since the beginning; are still at work, shaping our earth household. The vectors and tangents of creation, collapse, and rebirth have been traced out in the intricate folds of the unconscious. The unconscious is collective, communal, ecological. We are woven inextricably into the fabric of place through ecological contents. Reinterpreting Jung's notion of the collective unconscious, Ted Roszak in The Voice of the Earth explains: the collective unconscious "might then be regarded as the repository of an evolutionary record that ties the psyche to the full sweep of cosmic history. Mind, far from being a belated and aberrant development in a universe of dead matter, connects with that universe as the latest emergent stage on its unfolding frontier." Bear is a link, sometimes called an archetype, that connects the neolithic with post-modern consciousness. And the clasp, holding all the links together, is place.

WORKING IN PLACE

Bear grandfather and *Bear grandmother* can teach us the old ways, which are new ways of understanding our place in this place we call home. Knowing where and how to gather huckleberries and boletus in the forests of Cascadia is one kind of work that connects. The fruiting bodies of place are a thousand local gods. Through them life becomes ripe. Through knowledge of them, through tasting them, we become placed.

Dis-covering the local gods is turning over new leaves; looking through surfaces, over and under rocks. Among the local gods in the Cascadia bio-region are: *fungi, salmon, hazelnuts, marshes, camus roots, Bearberries, gray squirrels, rivers, tree frogs, lichen, elk, cirrus clouds, soils, cattail and sedge, birds, rosehips, sunflowers, hemlocks, newts, damsel flies, smooth stones, waterfalls, human kindred, fir cones, meadows, sword ferns, voles, spores, and seeds*. As *Bear* makes her rounds she is mind-full of all these beings. Following in her tracks we become *Bear-full* of all the constituents of place, and our native place in Earth's ever-unfolding geography.

Ancient people, indigenous people, have celebrated *Bear* through ritual and ceremony. Paul Shepard and Barry Sanders, in their important work on *Bear* entitled Sacred Paw, summarize: "Each one of these rites addresses a transformation, a process of change. In a world view in which humans play a cosmic participatory role, nothing is taken for granted. The rising of the sun, the turning of the seasons, the passages of a human life all require human action. But the basic process is always that of a wheel of existence whose movement is epitomized as a genetrix—the work of a metaphysical mother. A feminine principle of birth, growth, death, decay, and rebirth lies at the heart of the veneration of the *Bear*, for the *Bear* is the supreme model—and therefore the guiding spirit—of the theme of renewal."

Only four hundred generations ago we were hunters and gatherers. Less than 10,000 years is too short for evolution to uncoil from the double helix significant changes. As noted anthropologist Carleton Coon remarks, "We and our ancestors are the same people." Knowing and praising the local gods is establishing connection with duration through place. Driving deeper, we are given to understand the very atoms of our bodies may have been forged in stars, in distant nebulae. Could it be said that ontogeny recapitulates cosmology? Such a long round is the greater Gaian heritage.

THE WAYS OF PLACE

Along comes pigeon-toed *Bear* shambling through the underbrush of salal, making his way into a forest clearing. We are less than five hundred years removed from native Kalapooya hunters stalking, tracking every move and gesture of old grandfather-with-hair-on-his shoulders. *Bear-teacher, Bear-shaman* in his travels reveals medicinal plants to cleanse the body, the location of springs to quench thirst, and what it is to walk slowly with great calm like a mountain. As Max Oelschlaeger reflects, "There is a pathless way for mountain walking." And Gary Snyder advises, we must learn to walk "with the land and animals of Turtle Island in a sacred manner."

A scent on a breeze yields a hundred whiffs of information. Ecological knowledge is understanding the unique character of all things and their native symbiosis. Understanding human connectedness with Nature is essential, as Ted Roszak notes, "to the health of both person and planet: the primitive, the organic, the feminine, the child-like, the wild." We must learn to follow our noses through the thickets.

Learning to read the texture of soil, the stratification of rock, is learning the lengthy history of earth's becoming. Listening to stream music carries one through a round of the hydrologic cycle from the snow-covered peaks of the Three Sisters, down the chiseled valley of the McKenzie River, and on through flat coiling passages in the Willamette Valley until joining the Columbia River in its final run to the Pacific Ocean. Observing the character of place is the first step down the forest trail which leads to the waterfall. In the presence of the waterfall everything merges.

Respecting the dignity of all things is recognizing intrinsic connection, a mutuality of interest among all things. An accord of dignity is an accord of peace which affirms the inherent worth of all parties. All things are not equal; rather all things are interdependent in community. Though unequal in weight, all things share inherent worth and deserve respect. Praising the local gods, the fruiting bodies of one's bio-region, affirms community in its broadest sense. Think locally, act locally, consume locally. Living mycorrhizally is living in symbiotic relationship with roots of plants and animals and ancestors. This is the original meaning of ecological education.

As *Bear* walks beside a stream she listens to Salmon. Salmon is saying that water is dying. Dams and diversion channels have taken away water's ability to flow its native course. It is more than Salmon that is endangered; it is the very sculpting potential of natural processes. As Dolores LaChapelle writes in her inspired book Earth Wisdom, "The highest good is the optimally functioning ecosystem as a whole, not the immediate purposes of any one being in the ecosystem—man in-

cluded." She goes on to explain that living in balance with all beings is understanding the way patterns of energy move through place. Whatever we do uses energy from Nature; it is therefore incumbent upon us to return energy to Nature. To do this we must gather earth wisdom by living in a manner that promotes diversity.

Embodying a "land ethic" is acknowledging that an action is right, in the words of Aldo Leopold, "when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." *Bear,* like man, is both messenger and passenger. *Bear* is a litmus of the health of place. Displacing *Bear* is removing a way of understanding how we are doing, as well as *what* we are doing to Earth.

Bear can serve as tutor or teacher leading over varied terrain to a more complete understanding of the principal rhythms in the annual round. Shepard and Sanders conclude their chapter entitled "That Ursine Quality" with a story from which the following is an excerpt.

So the Bear became the man's special guide in shaping all the separate acts of life into a harmonious whole, fostering in the man's mind the idea of coherence and sequence and even transcendence. Further, in its assured and solitary way the Bear seemed to know something that was not enacted, perhaps to have a secret. The man watched the Bear for many years and finally he understood: the Bear, knowing what was to come from what was, was himself the eye of the future watching the present. His gift of revelation, unlike those skills which man could learn from the other animals once and for all, was continuous. His message was the health of the wilderness, which was always changing. The Bear was the voice of the earth itself. Then the man, remembering that the Bear was his mentor, realized that he himself had that voice, if only he could learn to sing as sweetly as the Bear.

MIND-FULL

Bear-ing in mind is respecting the dignity of all things; the livingness of all things. Today our collective habitat is at risk because humankind's relationships with wild lands and wild lives are in distress. Being *Bear-mind-full* of place is leaving enough for succession. Changing the course of rivers, the biological make-up of forests, alters the ground rules. Only volcanoes can change the ground rules with impunity.

Knowing the right names, choosing the correct tools, overcoming ambivalence, these are some of the actions toward which *Bear knowledge* can lead us. Such knowledge will require transformations, changing our destructive ways to once again be in accord with the old ways. It is, as always, a matter of endings and beginnings. As noted in David Rockwell's Giving Voice to Bear, for the Tlingit people of the Pacific Northwest, *xuts tla*, or *Bear Mother* is the "Strong One" who nurtures and leads the way. Listening to Bear is heeding the healing voice of the feminine.

Being *Bear-full* in place is leaving enough for the next one who comes along. Clearcutting is destabilizing. Whenever diversity is removed and replaced with monoculture, the ability of habitat to restore itself is impaired. The more things become the same, the more vulnerable to manipulation they become. Diversity is the Earth's best defense against intellection. Straight-line intellection reduces things to commodities for the purpose of balance-sheet accounting. Once an ancient Douglas-fir becomes a calculation of board feet, it is reduced from guardian to victim, and so is the one who makes the calculation.

Knowing one's *Bear-ings* is adjusting one's behavior and demeanor to be alert to all the postures, odors, sounds and gestures in the surround. The energy of place is inherent in existing footprints. Walking like *Bear* is following the path of native topography.

In his discussion of primal religions, Alan Drengson explains: "...The world is an ongoing, creative process to which we must pay close attention. We come to know it, not just by thinking about it, but by being immersed in it, by letting it speak to us, by being in it in a myriad of ways. So, be the tree, be the wolf, be the Bear, be the flowers of the field and the mountains. They teach us to be free and whole and how to live with ecological wisdom... Everything in nature is a teacher."

As in forests so in streams, we arrive and depart with the ouzel, like John Muir becoming wet with the plasma of place. Deep communion with place occurs through immersion and emergence. Place-centering is healing the wounds of separation. Place-centering is taking strength from the wild. We become resource-full to the extent we become *Bear-full. Bear* resurrects life after a winter's hibernation. Spring bounds out of a winter's sleep reaffirming new life. *Bear* lives within us as we give voice to the earth. Incorporating *Bear* wisdom is a pursuit of deep ecology.

WORKS CITED

Coon, Carleton S. *The Hunting Peoples*. Boston: Little Brown and Co., 1971.

Drengson, Alan R. "Paganism, Nature and Deep Ecology" *The Trumpeter*, Vol.5, No. 1, Winter, 1988.

La Chapelle, Dolores. *Earth Wisdom*. Silverton, CO: Finn Hill Arts, 1978.

Oelschlaeger, Max. "Mountains that Walk" *Wild Earth*, Vol.2 No. 3, Fall, 1992.

Rockwell, David. *Giving Voice to Bear*. Niwot, CO: Roberts Rinehart, 1991.

Roszak, Theodore. *The Voice of the Earth*. New York: Simon & Schuster, 1992.

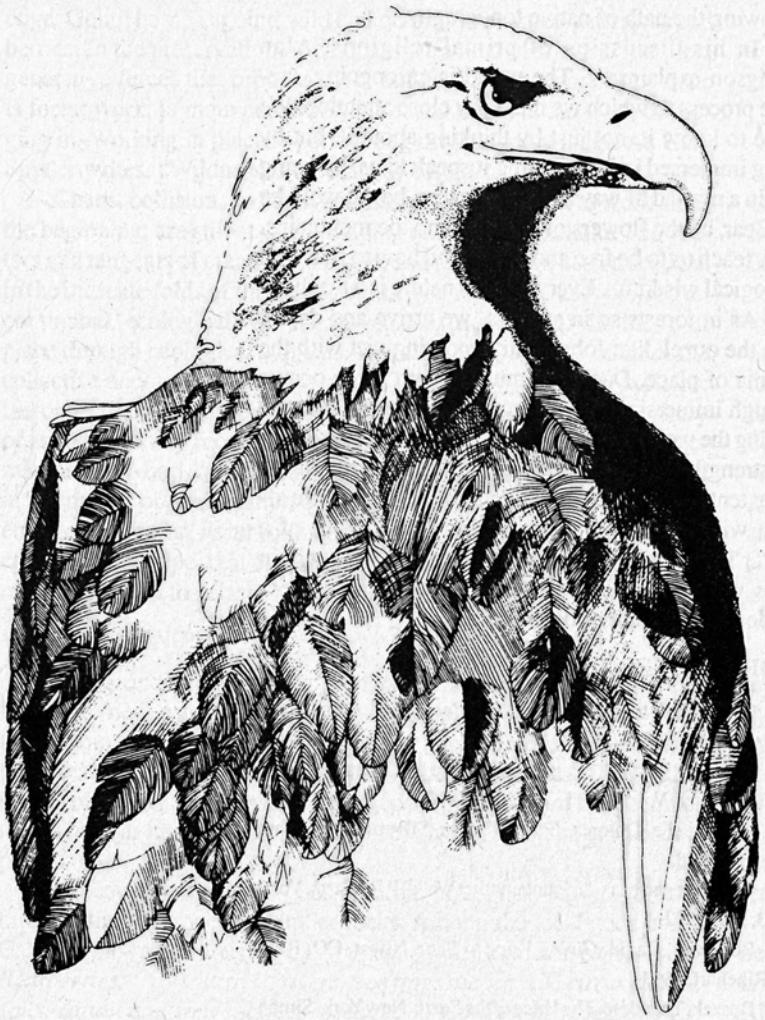
Shepard, Paul and Barry Sanders. *The Sacred Paw*. New York: Viking, 1985.

Snyder, Gary. *The Practice of the Wild*. San Francisco: Northpoint, 1990. *The Old Ways*. San Francisco: City Lights Books, 1977.

David Clarke Burks (3820 Monroe Street, Eugene, OR 97405) is an environmental writer and poet placed in Oregon's Willamette Valley. He is presently writing a book on one of Cascadia Bioregion's totems—salmon—and working on an anthology exploring the wildlands/culture interface.

The Presence of the Absence of Nature

Environmental Ethics and Prehistory



by Paul Faulstich

INTRODUCTION

Consider, as you read this, the state of this planet: deforestation, desertification, acid rain, global warming, unprecedented extinction rates, accumulation of toxic wastes, and overpopulation. These are among the immediate threats to cultural and biological diversity. Indeed, when combined, these factors threaten the very biological forces upon which life is based. It is difficult to imagine a continuation of our present habits without ecological crash.

But I'm not writing of environmental doom and gloom; I'm addressing issues of archaeology—specifically the opportunities and responsibilities within this discipline. That I've chosen an ecological frame, however, is not of minor consequence. My theme centers on what archaeologists can offer the discipline of ecology and the philosophy of ethics. What, if anything, do archaeologists possess that is uniquely insightful about the relationship between *Homo sapiens* and the natural world?

It is, I think, easy for archaeologists to remain cognizant that the concepts of 'culture' and 'nature' overlap, and because of this we can readily explore the relationship between human societies and their environments. Archaeologists are uniquely positioned to understand cultures and environments as *systems*, and the time perspective offered by archaeological inquiry enables us not only to encounter the past, but to confront the future.

I offer no blueprint for the ethical practice of archaeology; I have no guidelines for an ecologically-correct expression of the discipline. Instead, I offer a brief reflection on archaeological roots—roots that inevitably have earth clinging to them. And I look to our present condition for the imperative of pursuing a penetrating natural philosophy—an organic archaeology.

CONSIDERATIONS

The archaeological perspective entails a degree of detachment, a predilection for spatial-temporal holism, and an understanding of the interrelationships between cultural, biological, and psychological factors. The methodological specialties and theoretical ruminations of archaeology can illuminate critical aspects of the human condition.

illustration by Rosemary Roach

Understanding the *processes* of our modern condition is a fundamental step toward understanding our ecological crisis. *Homo sapiens*, and the rest of nature, have become victims of our short-run industrial success. In order to avoid ecological crash we must critically review our contemporary situation within the broadest possible context. This contextualization can perhaps be archaeology's greatest contribution.

Archaeology is related to ecology in essential, preadapted ways. Archaeological knowledge is derived from a blending of nature and culture, of Earth and body. This blending is physical and tangible as well as symbolic and metaphorical. Minds that think ecologically can penetrate beyond the idiosyncrasies of raw archaeological data to arrive at a synthetic understanding of the human predicament. But in general, archaeologists have not been champions of contemporary ecological perspectives. What has characterized the development of archaeology into the 1990s is a remarkable clarification and refinement of means, or techniques. This technical proficiency, however, has not resulted in a consensus on desirable ends.

What I take to be a desirable end is an increased passion for, and understanding of, ecological principles and the insights that well up from this understanding. In not recognizing ecological patterns and insights we run the risk of misconstruing our own prehistories and of inappropriately designing our futures. Misunderstandings of these patterns have allowed us to construct unrealistic models of the position of humans within nature.

Our modern patterns of subsistence have locked us into stealing from the future; we are relying on non-renewable resources to sustain what can be only a temporary affluence. The prosperity many of us enjoy is achieved at the expense of our descendants, and of marginalized peoples and natural diversity. To gain perspective, we need to relate the future to the past; to learn from the mistakes of those who came before, and to borrow from their successes. In order to wisely chart our future, we need a realistic and ecological interpretation of the past.

The purpose of archaeology should be to illuminate the nature and causes of the human predicament so as to lend insight into the possibilities of new directions. As humans, we must recognize our deepest histories and we must learn to honor the ecological principles of life on Earth. Comprehending the modern human dilemma requires a new paradigm which not only celebrates our achievements, but takes a critical, self-reflective look at them. For what is happening to us now is merely a sequel to our past achievements.

PARADIGMS

When I speak of ecology I speak of ideas far more fundamental and critical than recycling, renewable energy, or even global warming. While these issues need our attention, it is dangerous to become preoccupied with what is superficial in the face of more critical concerns. We must confront the very relationship between human nature and the natural world. The basic principles of ecology are so central to understanding this relationship that they need to be common knowledge.

The language of ecology has basically been the territory of environmental philosophers and scientists. Numerous writers since Emerson and Thoreau have explored human/nature relationships. Consider the interdisciplinary writings of Gregory Bateson, which deplore our destructive behaviors and call for a more organic relationship with the natural. How such an organic relationship can be achieved in our cultural universe is open for exploration. Is there a natural and balanced relationship between humans and the rest of nature? Does our role as tool user and predator preclude unproblematic membership in the world? Are we at home in the natural landscape, or are we visitors, or obtruders, or pillagers?

An anthropological paradigm is useful here. Such a construction distinguishes nature from culture; it conceives of *Homo sapiens* as a species that has, at least since the invention of language, been aware of tension and even estrangement between itself and the natural world. Any measure of ecological and philosophical harmony that *Homo sapiens* has found with nature has been an achievement—a work of art. Perhaps this harmony is not really something achieved between humans and nature, but is simply a dialogue which we have carried on among ourselves.

The paradigm I am advocating merges ecological and anthropological perspectives. It suggests that an unambiguous relationship between nature and culture is impossible in purely literal terms, and that humans have always felt a tension between ourselves and nature. This tension is not wholly modern, nor is it specifically the result of civilization or industrialization. It is a consequence of our humanness—of having a greater level of self-consciousness than other animals (Jordan 1991:64).

Culture has created this polarity, yet it also provides a mechanism through which to deal with this condition. Consider totemism, where the ecology of expressive culture is particularly obvious and rich. The totem transcends the appearance of difference between various natural species, and it helps to account for the emergence of humans as distinct from other species while simultaneously maintaining an identity with the rest of nature (Shepard 1973:170; Oelschlaeger 1991:13).

If the paradigm I am suggesting has any validity, then the root of our modern alienation is not so much technological, as it is a loss of meaning and connectedness with the natural world. In looking to the past for insights to the future, I am not attempting to trivialize or idealize prehistoric cultures. Instead, I am exploring the possibility of recovering or creating afresh a meaningful relationship with the natural. I'm advocating not so much borrowing from the past as inventing for the future. This kind of inventing is more concerned with human *conditions* than with human *contraptions*. Perhaps archaeological contributions to environmental ethics will not be so much in the realm of policy as through the insights we bring to the human condition *vis-à-vis* ecological considerations.

Reflect upon the insights that archaeological investigations can bring to the following ecological ideas (after Catton 1982:238):

A) *Homo sapiens* inescapably belong within interdependently evolved biotic communities.

B) Culture is shaped by intimate linkages of cause and effect within the web of nature.

C) Biological limits and possibilities affect every aspect of human beingness.

CAPACITIES

We are living in an overloaded world; and our future will be a product of our past, and of our interpretation of the past. Because of this, it is imperative that we evaluate our present condition and how we got here. Additionally, we must acknowledge that our present situation entails a certain kind of future.

In two million years of cultural and physical evolution, *Homo sapiens* have succeeded in exploiting ever greater portions of Earth's life-supporting capacity. *Homo sapiens* have raised the limits of carry-

ing capacity through a series of technological inventions that evolved with culture.[1]

Each succession—each human success—has been at the expense of other creatures. *Homo sapiens* is like every other species in being able to reproduce beyond the carrying capacity of any given habitat. This is the Malthusian principle; that the cumulative biotic potential of any species exceeds the carrying capacity of its habitat. But we humans have imagined ourselves to be more unlike other mammals than we really are, and have invented an array of fanciful explanations to account for overexploitation and to relieve ourselves of accountability. We do differ from other species, but largely in that we are capable of reflecting upon our tendencies and envisioning their consequences; and in that we transmit to our descendants a cultural as well as a genetic heritage.

The potential inequality between a human culture and a habitat is fertile ground for archaeological interpretation. Archaeology has well illustrated this problematic relationship: An example is the reconstructed prehistory of Rapanui, or what is more commonly known as Easter Island. Following a period of cultural efflorescence, combined pressures on this small piece of land resulted in social and environmental crash.

Ecological and archaeological data from Rapanui suggest that human-induced environmental change created the conditions for disaster. In this model (summarized from McCoy 1979) the cumulative effects of population growth are correlated with the irreversible process of environmental degradation. Archaeological evidence of culture change indicates that adaptive strategies were invented in a vain attempt to cope with diminishing resources. After about 1200 years of habitation, Rapanui's population peaked—perhaps around 7000 people. Deforestation, agricultural expansion, and the burning of vegetation during warfare decimated the island's flora. Wind and water erosion and diminished surface moisture combined to decrease crop yields. Emigration was virtually impossible because of the island's extreme isolation and an inadequate supply of timber. The prehistory of Rapanui has lessons for the modern world; given our predicament of global overshoot,[2] perhaps we can discover insights to soften the crash toward which we too are headed (Catton 1982:216).

Even our perceptions of space must be called into question. Prior to the arrival of Columbus in North America, for example, indigenous peoples essentially filled the ecological niches available to foraging and gardening hominids. Between three and five million people lived in North America in 1492. They had explored the entire continent and created rich and varied cultures intricately attuned to the rhythms of the land and its resources. European colonizers, however, perceived of this land as being only sparsely occupied.

The construction of American history typically centers on the notion that the continent was an uninhabited and unexplored wilderness with limitless resources awaiting discovery and utilization. Of course, bioregions support fewer people when foraging rather than farming is the mode of subsistence. Given their largely hunting and gathering cultures, Native Americans filled—and in some cases even exceeded—regional carrying capacities. According to Catton (1982:26), "a continent that was (ecologically speaking) 'full' of hunters and gatherers was bound to seem almost empty to invaders coming from an agrarian culture and accustomed to that culture's greater density of settlement." The invading culture was able to colonize the land with much greater numbers because they exploited the continent's phantom carrying capacity.[3]

Prehistory and history have seen *Homo sapiens* narrowly escape cultural and ecological crashes by migrating from overloaded locales to fresh locales which are then immediately modified. Pacific Island migrations illustrate this well; after exhausting the resources of one island through overpopulation or overexploitation, migrations temporarily eased pressure. The migrations enabled the Islanders to fill little-used niches throughout the Pacific. Much has been written about the motives that led the people to abandon their home islands in search of new land; warfare, famine, overpopulation, and political ambition are among the posited reasons (Finney 1979:347). Archaeologists can continue to shed light on the relevance of migration and succession in human ecology.[4]

Within the last 10,000 years—since the time when some human cultures began to shift from foraging to agriculture—our species has altered the structure of ecosystems, and we have tremendously increased the mass of *Homo sapiens* on Earth. In only about 400 generations human population has doubled nine times (Catton 1982:108), and nine doublings is more than a five-hundred-fold increase. In 1650, the world's human population was about 10 percent of what it is now; currently over five billion (Snyder 1990:177). *Homo sapiens* has become a global dominant in that we have greater influence than any other species on our biotic community. Four hundred years of European dominance of the global community has changed so much of the world that little of it resembles the biological habitat in which *Homo sapiens* evolved and to which we are genetically fitted (Catton:111).

Archaeological landscapes tell us that earlier cultures faced their own local ecological crises. At times, these peoples were forced to abandon certain habitats, or drastically change their cultures. However, the scope and quality of the alterations that modern industrialization has

created make prehistoric problems seem globally insignificant (Bodley 1985:27). What we face now is nothing less than a planetary crisis. Contemporary human societies are inextricable components of a global biotic community, and human dominance is having self-destructive consequences (Catton 1982:10).

DEPARTURES

Archaeologists have mostly left the ecological speculating to human ecologists and natural philosophers. These scholars have often utilized and restated archaeological findings to inform ecological models. But the privileged position of archaeologists enables them to eloquently speak on these critical issues *directly*. They can help to articulate the requirements for a non-destructive relationship between humans and a given habitat. Because of their posture—which is somewhere between physical science, social science, and art—archaeologists can help illuminate the requirement that any sustainable culture be a system of mutual and interdependent cooperation between humans and a bioregion. From the lessons of prehistory they can advocate the need for enlightened self-restraint.

In their own works, achaeologists can begin by relearning the vocabulary of ecology, so basic to their discipline. This does not mean that they should simply use eco-phrases which come in and out of fashion, like 'recyclable' and 'biodegradable'. I'm suggesting a vocabulary as rich and deep as human history. Of course, we don't have such a vocabulary, but words and phrases like 'adaptation', 'carrying capacity', 'ecosystem', 'niche', 'symbiosis', 'habitat', 'totemism', and 'metaphor' will get us started. Once these concepts are recentered in our daily working language, then we can more fully apply ecological principles to the human situation, and an ecologically based archaeology which transcends subdisciplines will emerge.

Through our critical look at human prehistory we see some ecological truths. We see that, as cultural animals, humans are indeed different from other creatures, but not so different as to exempt us from ecological principles. We know that culture change is not always adaptive over the long run, and that even small-scale societies have stressed local systems beyond the breaking point. And we have learned that the side effects of behavior are not always immediate or easily seen. Above all, I think, we can see from the past that the best hope for sustainable cultures and healthy ecosystems is a respect for diversity combined with ecological modesty.

An environmental ethic for archaeologists is not just a set of theories, but a path that leads us—through its rich past—into a balanced future. This path, narrative in nature and broad in scope, is embedded in organic history. An environmental ethic requires a sense of place; not always rooted in a single locality, but always true to the narrative prerogative of the land (cf., Rolston 1988:352). The ethic that emerges is textured by the land. It is not academic; it is a sensibility developed through astute observation, experience, and contemplation. It is an ethic in the almost forgotten sense of a way of life (cf., Rodman 1977:110-11).

In pursuing chosen paths within that great meditation we call archaeology, we would do well to heed the wisdom of the conservationist Aldo Leopold (1969: 224-5): "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." As seers of the past, archaeologists can help guide humanity toward a future that is right.

SOURCES

Bodley, John H. 1985. *Anthropology and Contemporary Human Problems*. Mountain View: Mayfield Publishing Company.

Catton, William R., Jr. 1982. *Overshoot*. Urbana and Chicago: University of Illinois Press.

Finney, Ben R. 1979. "Voyaging." In Jesse D. Jennings (ed.), *The Prehistory of Polynesia*, pp.323-51. Cambridge: Harvard University Press.

Jordan, William R. 1991. "A New Paradigm." *Restoration and Management Notes*, 9:64-5.

Leopold, Aldo1969 (1949). *A Sand County Almanac*. New York: Oxford University Press.

McCoy, Patrick C. 1979. "Easter Island." In Jesse D. Jennings (ed.), *The Prehistory of Polynesia*, pp.135-66. Cambridge: Harvard University Press.

Oelschlaeger, Max 1991. *The Idea of Wilderness*. New Haven and London: Yale University Press.

Rodman, John 1977. "The Liberation of Nature." *Inquiry* 20:83-131.

Rolston, Holmes III 1988. *Environmental Ethics*. Philadelphia: Temple University Press.

Shepard, Paul. 1973. *The Tender Carnivore and the Sacred Game*. New York: Charles Scribners Sons.

Snyder, Gary 1990. *The Practice of the Wild*. San Francisco: North Point Press.

NOTES

[1] Human carrying capacity is the maximum population that a particular habitat can support indefinitely under specified technology and organization (Catton 1982:272). Caution should be exercised when using this term, however, since it relates to a paradigm that views natural systems only in terms of resource extraction and sustainability, ignoring such considerations as species diversity and environmental ethics.

[2] Overshoot is the condition of exceeding a region's carrying capacity (Catton 1982:278).

[3] Phantom carrying capacity involves non-renewable, temporarily available resources. Reliance on phantom carrying capacity is, of course, extremely precarious since it is based on non-sustainable resource extraction.

[4] In this usage, succession is the pattern of social and ecological change resulting from modification of a habitat.

Paul Faulstich is Assistant Professor of Environmental Studies at Pitzer College.

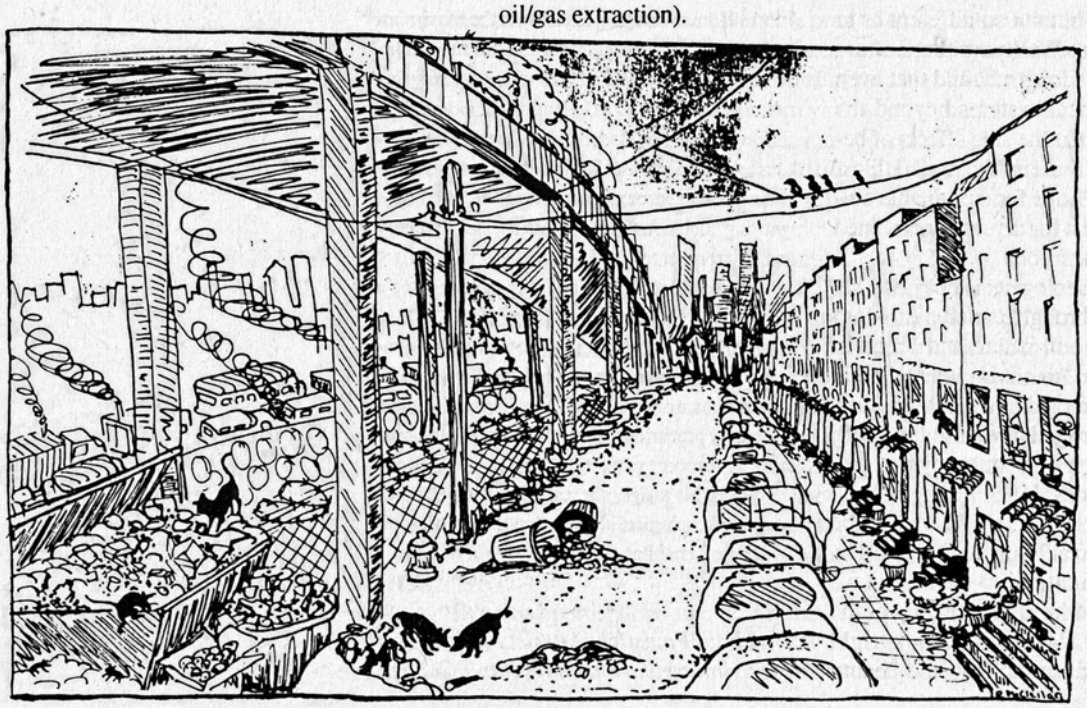
Facing The Immigration Issue

by Nick Ervin

In late 1991 the United Nations released its first major report on overpopulation and its link to the disastrous deterioration of our global commons. Population biologists like Drs. Paul and Anne Ehrlich often speak in terms of the equation: I=PAT, or Impact=Population x Affluence x Technology. Otherwise stated, humanity's impact on the biosphere equals the cumulative effects of 1) the size of the human population, 2) the level of affluence (amount of resource consumption) and 3) the technology utilized. Within this equation lies the key as to why the developed nations pose the gravest threat to the systems supporting all life.

Although we in the United States make up less than 5% of the world human family, we consume an estimated 30% of world resources. That rate of consumption more than compensates for a population density and growth rate lower than in much of the developing world.

Our nation's and world's carrying capacities have been exceeded. Put differently, populations are already damaging planetary life support systems (fresh water, clean air, fertile topsoil and accessible minerals). We Americans only maintain our lavish lifestyles by importing massive quantities of energy resources (e.g. oil) and by extracting our own natural materials at unsustainable levels (mining, overgrazing, excessive timber cutting, overcropping to soil exhaustion, and oil/gas extraction).



One sensitive component of the population issue domestically is immigration. The major national conservation organizations have genteelly tiptoed around the issue, fearing adverse political repercussions. A few more specialized groups, particularly Negative Population Growth, and Population—Environment Balance, have courageously broached the topic with specific proposals. Unfortunately the Reagan government during the 1980s gutted many family planning programs at home and abroad. Under George Bush we took several more steps backward, most notably modification of immigration policy making it easier for foreigners with relatives already living here to immigrate. It has been estimated that the backlog overseas of those

illustration by Roz McClellan

qualifying under the new rules approaches 20 million. These changes were enacted at the same time a scientifically random poll by the Ropers organization found that 87% of Americans believe the United States has a population problem. Of those, 2/3 supported reducing legal immigration and better than 9 in 10 supported an "all-out" effort to stop illegal immigration.

The 1991 United Nations report on population and the environment persuasively laid out the scientific evidence linking human population/consumption patterns and the ongoing ruination of our biosphere. The effects of such deterioration in terms of real human suffering alone—starvation, economic exploitation, and crime—are becoming starkly apparent. Meanwhile, the US increases its human population by 3 million per year, of which 1.2 to 1.9 million, depending on your source, are immigrants, legal and illegal. America has the highest fertility rate of any developed nation on Earth and we permit more legal immigrants through our borders than the rest of the world combined—up to one million per year when all classes are included in the numbers: refugees, those under regular formulas, and people with family members already residing here (who are not included in the restricted quota numbers).

California absorbs fully 1/3 of total US immigration and, partly as a result, tops the country in its fertility rate of 2.48 children per couple (1989). US Census Bureau figures released in 1992 show that one San Diego resident in five was born in a foreign land.

Considerable media attention is devoted to the social and financial costs associated with such statistics. We hear about increasingly crowded school classrooms, overburdened hospital emergency rooms, and packed local justice systems.

The largely untold story revolves around the ramifications for America's natural areas and environmental quality, which are badly strained by the growing numbers of human beings here, including immigrants. Some examples: between 1984 and 1990 California lost 140,000 acres of prime agricultural land to development; only 5% of this country's original virgin forests remain uncut, as largely population-induced demand for wood products soars; up to 2/3 of our Western rangelands are in unsatisfactory condition due to overgrazing by domestic livestock raised, ostensibly, to feed and clothe our people; natural aquifers are being drained to slake our population's thirst for water and demand for irrigated food crops.

Moreover, immigration into the US means higher consumption rates globally and higher fertility rates nationally. Anne and Paul Ehrlich explain: "...from a global environmental perspective, immigration into the US is not neutral...even the less well-off (immigrants) quickly acquire American superconsuming habits. They tend to bring with them the reproductive habits of their societies, so that they also produce larger families of superconsumers than those of us whose families immigrated earlier."

Some in the conservation community are working to alter the established policies of the major national conservation groups in favor of aggressive and specific stands on immigration. In part these advocates propose we embrace a policy known as "no net increase" with respect to legal immigrants: permit only the same number of legal immigrants into this country each year as the number of American residents who leave permanently—about 200,000. No position is taken on whom should be allowed in, just the overall number. Further public discussion would establish priorities.

Of course, legal immigration is only part of a larger picture. In order to stabilize and then reduce total US population, we will need to take additional measures to curb illegal entry, offer more family planning resources to developing nations, and adopt our own comprehensive domestic blueprint for stabilization and reduction. Such measures will, perforce, require an extraordinary public debate in our country on such touchy topics as: contraceptive availability, family planning education in the schools, tax code disincentives for large family creation, and control of our international borders. This debate will be ethically complex and politically difficult. We must face it squarely.

Authentic immigration reform proposals with teeth in them will almost certainly draw intense fire. Proponents have been and will again be accused of racism, elitism or at least a chilly lack of compassion for the less fortunate. Edward Abbey, for one, drew vitriolic condemnation from many quarters in the 1980s for his prickly opinions on immigration. I firmly believe, nonetheless, that we do neither our homeland nor our planet (including its human members) a favor by acting as a continuing sponge for immigrants from other lands. In doing so, we retard the impetus behind population and economic reforms in other nations while seriously reducing the present and future basis for taking care of those who live here now, including recent immigrants. Large numbers of immigrants now enter an America ill-equipped to house or employ them adequately. They all too often join an exploited, permanent underclass trapped in poverty and joblessness or underemployment.

Growth in America, as elsewhere in this finite world, cannot continue indefinitely; one way or another population growth and runaway consumption will be halted. The longer we delay in taking aggressive, tenacious actions, the more draconian the ultimate solutions will be (ever hear of the Four Horsemen of the Apocalypse?).

The Clinton Administration has taken some promising initial steps on population. The President has reversed the Reagan-Bush ban on funding of the UN Fund for Population Activities and overseas agencies providing abortion counseling among their family planning services. While helpful, these actions were simple compared to what lies ahead. The US still lags far behind the funding targets it accepted in 1989 for overseas family planning services—the "Amsterdam Declaration" goal of providing contraceptives to all couples worldwide who wish them by the year 2000. And one can only imagine the level of opposition by the "wise use" crowd and its religious right allies to real government sponsored incentives for small families; genuine access for all classes of people to therapeutic abortions and contraceptives; widespread and biocentric family/sex education in the schools; or significant increases in money earmarked for population control overseas.

As conscious, aware beings we must take concrete action now to ensure human numbers no larger than what can be sustained at decent material standards over the indefinite future without destroying our fellow living creatures. To fail in this effort insults all races and classes of our citizenry. It also betrays the trust of our descendants who inherit the Earth we have borrowed from them.

Nick Ervin is a long-time West Coast environmental activist.

For news on bills in Congress pertaining to population and immigration, write Carrying Capacity Network, 1325 G St NW Suite 1003, Washington, DC 20005, and Federation for American Immigration Reform, 1666 Connecticut Ave., NW, Suite 400, Washington, DC 20009. See Anne and Paul Ehrlich's book The Population Explosion for information on the whole array of population issues.

Book Reviews

BATTLE AGAINST EXTINCTION: Native Fish Management In The American West

Edited by W.L. Minckley and James E. Deacon, University of Arizona Press, 1230 North Park Ave., Suite 102, Tucson, AZ 85719. 517p. $40.

Mention endangered species and most people conjure up images of wolves and Grizzlies. While mammals and birds have more public appeal, probably the most threatened vertebrate group in the United States is fish. Most of us have heard of the Passenger Pigeon, but how many of us have ever heard of the Ash Meadows Poolfish or the Thicktail Chub? These are among the fish species native to the West but now extinct. Unfortunately, these are not the only casualties of a changing West. In 1988, when the papers collected in Battle Against Extinction were written, 122 out of 150 known fish species west of the Continental Divide in the United States were extinct, listed under the Endangered Species Act or candidates for listing. Since then, several more species have been added to this growing list.

Fish do not get the attention given to more charismatic species. This is unfortunate, since fish are better barometers of ecological health than most other organisms, in part because their aquatic habitats reflect the cumulative abuse of the entire landscape. Pesticides, dewatering, sedimentation, and watershed destruction are all reflected in our waterways long before we recognize them on land. Besides the destruction or alteration of habitat as a consequence of irrigation, dam construction, and livestock production, the introduction of exotic species that outcompete native fish is also a major factor in fish decline throughout the West.

Battle Against Extinction brings together in one volume a collection of papers presented at the annual meeting of the Desert Fish Council in 1988. Included are discussions of early biological collection expeditions, ethical considerations, and life histories for many endangered Western fish species. Among the book's strengths is the application of principles of conservation biology to the design of aquatic reserves.

Nearly all fish discussed are considered "non-game" and have a small constituency. In fact, it is clear that these icthyologists are among the only supporters for many species, as desert fish are virtually unknown outside of fishery biology circles.

As with any work by many different authors, the written accounts are uneven in quality. Some chapters are more technical than others. Nevertheless, the overviews should be of use to anyone interested in conservation biology and concerned about the continuing erosion of our biological heritage. The book demonstrates that fishery biologists, are, on the whole, more enlightened about biological conservation than their counterparts dealing with big game species. Overall this volume provides an exceptional introduction to a major biological crisis, the extermination of our native fish fauna.

Reviewed by George Wuerthner (Box 273, Livingston, MT 59047)

ON NATURE'S TERMS: Contemporary Voices.

Ed. Thomas J. Lyon and Peter Stine. Texas A&M University Press: College Station, 1992. p. 212.

NATURE'S NEW VOICES.

Ed. John A. Murray. Fulcrum Publishing: Golden, Colorado, 1992. p. 242.

Add to the dozen nature writing anthologies published in recent years two more: *On Nature's Terms: Contemporary Voices* and *Nature's New Voices*. These 1992 collections, as their titles imply, attempt to distance themselves from the pack by containing the latest ventures in the time-honored tradition of the American nature essay. Most of these essays were written around 1990, by people younger than our parents. Nevertheless, there is little about them that indicates they are unique products of the final decade of this millennium. Only one of the writers seems to have an ideological axe to grind with his predecessor (unlike the typical patricide in fiction). And none of these works strikes me as remarkably innovative, challenging, or postmodern, steering the two-century-old nature essay into uncharted waters. Yet, these essays' familiarity does not breed contempt. Instead, it reassures.

If there *is* something novel about this batch of writers, it might very well be their ability to stretch our notions of what constitutes a sublime encounter with nature. Among other adventures, the reader gets to vicariously hunt with a pod of Killer Whales, surf along the Alaskan coast, stand uneasily on the side of an erupting volcano, and witness the births and deaths of innumerable Loggerhead Turtles on a remote beach. We also go in search of night-blooming cacti, elusive Mountain Lions, mysterious nightjars, and sundry roadkill. Although both collections contain traditional episodes of Thoreauvian sauntering, as a rule, nature writers of the 1990s, like their culture, are a manic, mobile lot. Two examples from writers in motion are Richard Nelson's "The Forest of Eyes" (*Nature's New Voices*) and Barry Lopez's "Apologia" (*On Nature's Terms*).

Nelson's selection, excerpted from his prize-winning *The Island Within*, recounts a solo mid- winter surfing expedition along an Alaskan panhandle island. With surfboard strapped to his back, dog alongside, and peddling a rickety three-speed bike into the snowy backcountry, Nelson just might cut the most eccentric figure in all of nature writing—surpassing Thoreau with his umbrella and Abbey without his canteen. For skeptics who doubt surfing can be a profound rendezvous with nature, listen to Nelson: "The motion that so exalted me was given freely by the wave, as the wave was given motion by the wind, and the wind was given motion by the storm, as the storm was given motion by the whirl of the atmosphere and the turning of the earth itself" (206).

In "Apologia," Lopez recounts a cross-country drive that keeps getting derailed by his pausing, musing, praying over, and disposing of roadkill. This odd, understated piece reaffirms the doctrine of biocentrism and confirms Lopez as a master lyricist. He writes, "The raccoons and, later, a red fox carry like sacks of wet gravel and sand. Each animal is like a solitary child's shoe in the road. . . . The ones you give some semblance of burial, to whom you offer an apology, may have been

like seers in a parallel culture. It is an act of respect, a technique of awareness" (84).

Contrasting sharply with Lopez's quietly pious message is Jack Turner's jeremiad, "Abstract Wild" (*On Nature's Terms*). It recalls Abbey in its sound and fury over wilderness destruction. In fact, Turner even disparages Cactus Ed, writing he is "angry that Wallace Stegner and Edward Abbey would boat around Lake Powell as guests of universities and the US Government..." (88). Turner's visceral prose calls for us to rediscover that actual good and evil exist in the world, not mere "likes and dislikes as in ice cream," and to realize what we've done to the nonhuman world constitutes a "moral wrong" (92). Then, Turner urges us to react: "Something vast and crucial has vanished. Our rage should be as vast. Refuse to forgive, cherish your anger, remind others. We have no excuses" (103).

Turner's piece is by far the most polemical in either book. In general, *On Nature's Terms* is more irascible, more eclectic and less mainstream than *Nature's New Voices*. For those reasons I favor it slightly. In addition to Turner's and Lopez's essays, it contains a mythic/psychoanalytical meditation by Terry Tempest Williams called "Undressing the Bear," burnished journal entries by Sherman Paul, and a piece by John Hay that was once performed to music in a Washington DC church. Gary Snyder, Charles Bowden, William Kittredge, Rick Bass, Gary Nabhan, John Talmadge, and Edward Hoagland, among others, also contribute to this collection. It should be noted that its 20 pieces are primarily about the landscape west of the Mississippi.

In contrast, *Nature's New Voices* spreads its 17 selections around the states. Writers in this collection include David Rains Wallace, Dan O'Brien, Jan DeBlieu, Gretel Erhlich, and Ed Engle. Reading about writers traveling widely in an Upper Peninsula forest, a Florida hammock, an Alabama river watershed, and a Hawaiian volcano was a pleasant change from the usual Big Sky stories that tend to dominate the genre these days.

In *Nature's New Voices*, Rick Bass, now himself primarily identified as a "Montana writer," has a wonderfully funny essay, "Sipsey in the Rain," about the idiosyncracies that surface while backpacking with a group through an Alabama wilderness. Bass shrewdly observes that our pack's contents reveal much about our own psyches. "There is (as there is in all of us) a small streak of the bizarre in Jim Trunzler," writes Bass. "It needs letting out every now and then; it needs a release of tension. I politely chose to view this abnormality of bringing eggplant pizza as a minor illness, and (politely) avoided mentioning it to him" (74). Bass and Terry Tempest Williams are the two writers who appear in both anthologies, testifying to their recent rise to prominence.

So, again I wonder if these latest voices of Bass and Williams and the others are that "new." Does Bass's paean to simplicity in "The Afterlife" wander that far from Thoreau's? Are Williams's desert/existential reflections that removed from Ann Zwinger's or Edward Abbey's? Is Jack Turner's call for an ethical stance toward the land any more radical than that voiced by Aldo Leopold a half-century ago?

Perhaps, finally, the answers to these questions really don't matter. What matters, instead, is that there is no gap between this new generation and ones previous. What matters is that these younger writers, born after World War II, shaped by the Sixties, survivors of the Eighties, continue to find value in nature. We find ourselves welcoming them into our homes as we would the children of old, dear friends.

Reviewed by John A. Kinch

THE DIVERSITY OF LIFE

by Edward O. Wilson, The Belknap Press, Harvard University, Cambridge, MA 1992, 424 p. $29.95

Even for those versed in the critical issues of biodiversity it's often difficult to focus beyond the immediate threat to a species or habitat and grasp the full meaning of the extinction event our species is forcing upon the planet. For those unfamiliar with basic biology it seems inconceivable or, irrelevant. What this subject has needed is a book that could reach a wide audience, to make the problem obvious and the basic arguments accessible to enough people that meaningful actions become possible: A book like Silent Spring, which led to federal laws governing chemical use in the environment, or The Fate of The Earth, which made clear the potential devastation of even limited nuclear war.

The Diversity of Life has all the potential to be such a book. Edward O. Wilson's literary work has already won him a Pulitzer Prize, and he is an acknowledged authority on ants, though his writing covers a wide range of subjects in natural history and ecology. In this book he takes up nothing less than the new field of biodiversity—its origins, constituents, and the processes of loss and rebuilding. He accomplishes this with an eye for detail that both illustrates and fascinates. Yet this story is meant to do more than educate. It is carried forward on an undercurrent of passion which emerges at times with wrenching clarity:

The sixth great extinction spasm is upon us, grace of mankind. Earth has at last acquired a force that can break the crucible of biodiversity. I sensed it with special poignancy that stormy night at Fazenda Dimona, when lightning flash revealed the rain forest cut open like a cats eye for laboratory investigation...the nighttime vision was a dying artifact, a last glimpse of savage beauty.

Almost it seems Wilson had a murder mystery in mind when he conceived the outline for this book. At one point he mentions a detective story burned into his memory by way of being the only literature available during an extended period of fieldwork. Indeed The Diversity of Life begins with a violent death—the sudden volcanic obliteration of all life on the Indonesian island of Krakatau in 1883—then describes the aftermath, the return of life. "Violent Nature, Resilient Life" is the first section of the book, exploring the interplay of geologic and biologic forces, and thus the beginning of diversity, life flourishing amidst the world's upheavals. Wilson speculates on how and why life seems to proliferate, then stall, then move on again. He explains why life is now [or was until recently] more diverse than ever, though over 95 percent of all species that ever lived are now extinct.

Yet the final section, "The Human Impact," makes painfully clear that the present array of life is extremely vulnerable to the global disruption now in progress. Toward this fact Wilson aims all arguments, perhaps with the hope that one or more means of persuasion will reach each reader. The most obvious point, then, is the selfish one—as a species we will lose an incredible potential for useful resources and new knowledge by allowing the genetic impoverishment of the world to continue.

Wilson, though, is also a strong advocate of untrammeled nature, left to carry on its evolutionary directions independent of human benefit. He advocates preservation of intact and functioning ecosystems, and proposes a worldwide inventory to immediately begin protecting those areas with the most diversity, or the most specialized ecosystems. He sees a

much stronger government role in protective law, as opposed to the present trend toward trying to make economic incentives the prime tool for safeguarding nature. We are on the verge of dooming this world to a paucity of life that will take millions of years to recover. Some ecological restoration may be possible—"the next century will, I believe, be the era of restoration in ecology"—though Wilson cites molecular biologist Russell Higuchi in likening this process to "taking a large encyclopedia in an unknown language, ripped to shreds, and trying to reassemble it without the use of your hands."

Time will tell whether this book receives the attention it deserves. As it becomes increasingly difficult to make meaningful information discernible in the mass media, a book remains essentially a contemplative experience wherein ideas and thoughts may lead to a conclusion that encourages or inspires. This is E.O. Wilson's hope.

The stewardship of the environment is a domain on the near side of metaphysics where all reflective persons can surely find common ground. For what, in the final analysis, is morality, but the command of conscience seasoned by a rational examination of consequences? And what is a fundamental precept but one that serves all generations? An enduring environmental ethic will aim to preserve not only the health and freedom of our species, but access to the world in which the human spirit was born.

This book is still only in hardcover, so it is out of the price range of many readers. Its fate depends on demand and positive critical review. If you don't purchase a copy make sure your local library does. Read it and tell others your thoughts. A review or even a "letter to the editor" in your local paper will make still more people aware. Finally, request that the publisher move to a paperback edition quickly, and, if you are in academia, see if this book might become required reading in biology at the high school and college level.

Reviewed by Brian Carter, Concord, NH

Other Recommended Titles

The Earth Summit, A Planetary Reckoning, by Adam Rogers; 1993; Global View Press, 7095 Hollywood Boulevard, Suite 717, Los Angeles, CA 90028; 351p. $16.95.

Adam Rogers provides a broad overview of the June 1992 Earth Summit held in Rio. The book begins with a brief forward by Dr. Noel Brown, Director of the North American office of the United Nations Environmental Program (UNEP). Rogers, drawing upon hundreds of interviews, speeches and papers from before, during and after the Summit, describes and analyzes the historic gathering. He covers excerpts from speeches, the content and signing of the treaties, the role of business leaders, the similarities to the Stockholm conference of 1972, the commitment and/or neglect of the various leaders and details of the setting and participants, such as: "the Emir of Kuwait, Sheikh Jaber Al-Ahmad Al-Jaber Al-Sabah had every furnishing removed from his suite of rooms, so he could outfit the rooms with his own furniture which he had flown in from Kuwait." Unlike the Earth Summit itself, Rogers devotes a large portion of the book to the ideas and proposals of the youth, indigenous people, and non-governmental groups not invited to the Summit—revealing essential missing aspects of the Summit.

The book closes with an Afterword by Dr. David Suzuki, who states "I believe the Earth Summit in Rio failed to meet even the most pessimistic of expectations." Rogers's book is ideal for people interested in learning about what really occurred at the Earth Summit and what is happening on the road from Rio.

Incidentally, the only promise kept from the Earth Summit so far is Sea Sheperd's: They vowed to sink a Norwegian whaling ship if Norway continued illegal whaling.

—Kathleen H. Fitzgerald

Agenda 21, The Earth Summit Strategy to Save Our Planet, edited by Daniel Sitarz; 1993; Earth Press, 4882 Kellogg Circle, Boulder, CO 80303; 320p. $24.95.

Agenda 21 provides readers with an abridged version of the massive central document of the Earth Summit, Agenda 21. Agenda 21 was adopted by all countries who attended the Summit. Sitarz provides a clear summary and analysis of the document, while paraphrasing its essential parts. This book is key for citizens interested in Agenda 21, but lacking the desire to read the entire 900 page document. *—KHF*

The Activist's Almanac: The Concerned Citizen's Guide to the Leading Advocacy Organizations in America, by David Walls; 1993; Fireside, Simon & Schuster Building, Rockefeller Center, 1230 Avenue of the Americas, New York, NY 10020; 412p. $18.

The Activist's Almanac is an up-to-date resource informing readers about 105 environmental, peace, and social justice organizations in America. Walls describes each group's history, objectives, structure, budgets and contact addresses. The Almanac begins with a brief introduction describing trends in the movements and how citizens can help various NGOs. *—KHF*

Living Richly in an Age of Limits, by Bill Devall; 1993; Peregrine Smith Books, POB 667, Layton, UT 84041; 272p. $21.95.

In his third book, Bill Devall, one of America's leading writers on emerging trends in the deep, long-range ecology movement, focuses on lifestyle. The book is filled with case studies of individuals and groups who are successfully making transitions toward greener lifestyles. Changes in jobs, housing, transportation, gardening practices, consumption patterns, landscapes and built environments are all considered.

Devall's first book, Deep Ecology (co-authored with George Sessions), explained the deep ecology philosophy. His next book, Simple in Means, Rich in Ends, discussed putting the philosophy to work. Now, Living Richly in an Age of Limits gives practical suggestions for modifications that can enrich our lifestyles in North America without impoverishing the rest of the world. Devall suggests we can live richly if we accept levels of consumption widely accepted by the middle classes only fifty years ago.*—Dawn Valentine*

The Gulliver File: Mines, People and Land: A Global Battleground, by Roger Moody. 1992. Minewatch, 218 Liverpool Road, London N1 1LE, UK. 894p. $80 for non-profits; free to indigenous groups.

This is an encyclopedia on mining which will prove to be the essential reference book for environmental groups worldwide. The Gulliver File, which took 14 years to write, is approximately 900 pages of small print, with an easy to use A-Z format to locate the 672 mining companies and an index to mining operations in 128 countries and 43 states in the US. Information includes corpo-

rate ownership/partnerships, genealogy, global operations, references, and facts on specific mining operations that are difficult to come by (or, rather, facts that companies would prefer remain inaccessible). Contacts for citizens groups, for more information, are cited for some of the companies. London-based Minewatch has played a pivotal role in the communication network with indigenous and native peoples to help stop the plunder-for-profit of mining operations.—*Ellen Connett, Work on Waste, 82 Judson Street, Canton, NY 13617.*

Greenpeace Book of Coral Reefs, by Sue Wells & Nick Hanna, 1992; Sterling Publishing Co, 387 Park Ave S, New York, NY 10016; 160p. $35 hard.

The Greenpeace Book of Coral Reefs is an elegant and elegiac introduction to the ecosystems scientists consider second only to tropical rainforests in species diversity—coral reefs. It is elegant in its prose and pictures, elegiac in its prognosis. That is, if industrialized peoples don't change their evil ways, the authors gently but persuasively tell us, coral reefs will be among the early casualties of anthropogenic atmospheric disruptions. Throughout the tropics, reef ecosystems are already being damaged, and soon could be exterminated, by combinations of sedimentation from onshore logging and agriculture and offshore dredging, pollution, overfishing, nuclear bomb testing, and perhaps global warming and ozone depletion. The Greenpeace book stresses what we can do to stop the destruction, and lists groups working to save reefs. —*John Davis*

***State of the World 1993**: A Worldwatch Report on Progress Toward a Sustainable Society*, by Lester Brown et al.; WW Norton and Worldwatch Institute, 1776 Massachusetts Ave NW, DC 20036; 265p. $10.95.

Rarely radical but always informative and progressive, Worldwatch Institute's annual State of the World reports are now being read—though not usually heeded, unfortunately—by decision-makers worldwide. Speaking volumes for polyglots, State of the World has been translated into more languages (27) than the average pope can read, and is used in over 1000 college courses in this country. Especially notable this year are the papers by Jodi Jacobson, "Closing the Gender Gap in Development"; Peter Weber, "Reviving Coral Reefs"; Sandra Postel, "Facing Water Scarcity"; and Lester Brown, "A New Era Unfolds." The picture presented in this last perhaps epitomizes the stable and sustainable—but not wild and wonderful—world espoused by Worldwatch researchers and a growing number of world leaders. —*JD*

***Beginning Again**: People and Nature in the New Millennium*, by David Ehrenfeld, 1993; Oxford University Press, 200 Madison Ave, NYC 10016; 215p. $22.

Notwithstanding this reviewer's unswerving opposition to the written word, he can find no fault with Beginning Again. Indeed, this reviewer (i.e., I; after Strunk & White 1959) hereby proposes David Ehrenfeld for canonization. His new book is profound, lucid, insightful, truthful, ecologically informed, and even needed. In this volume, Ehrenfeld, outgoing *Conservation Biology* editor and author of The Arrogance of Humanism, has gathered many of his best essays from *Orion* and other publications. He trenchantly critiques space programs, over-specialization in science, technological fixes, and other pitfalls of modern society. Perhaps most important of the many lessons he shares in Beginning Again is this: "How big does a park or preserve have to be to save its species? This question is only now being asked in different parts of the world, and the answer is always the same: as big a you can get, but it won't be big enough."(p.181) —*JD*

Proceedings of the Symposium on Biodiversity of Northwestern California, October 28-30, 1991, Santa Rosa, CA; Wildlife Resources Center, Division of Agriculture & Natural Resources, U of CA, 145 Mulford Hall, Berkeley 94720.

Sponsored by the University of California, American Fisheries Society, Audubon Society, CA Dept of Fish & Game, Defenders of Wildlife, Environmental Protection Information Center, Natural Resources Defense Council, The Nature Conservancy, Forest Service, and other agencies and environmental organizations, this symposium elicited many fine papers on biodiversity in the Klamath Province of northwest California and southwest Oregon. Outstanding contributions include "Biodiversity: Many Scales and Many Concerns" by Reed Noss, "Natural Disturbance Regimes in the Klamath Province" by Tom Atzet & Robert Martin, "Legal Aspects of Biological Diversity" by Michael Anderson, "Ecological Susceptibility of Amphibians to Population Declines" by Deanna Olson, "Aquatic Invertebrates as Indicators of Biodiversity" by Nancy Erman, "New Perspectives on Conservation and Preservation in the Klamath-Siskiyou Region" by Tim McKay & Felice Pace, and "Bioregional Cultural Awareness" by Peter Berg. All of these will be of value to wildland proponents across the land, not only in Shasta Bioregion. —*JD*

Discovering Wolves, by Nancy Field and Corliss Karasov, illustrated by Cary Hunkel; 1991; Dog-Eared Publications, POB 620863, Middleton, WI 53562-0863. 40p. $4.95.

Discovering Wolves entices children to learn. The authors relay a wealth of intriguing facts about wolves, ranging from the body language with which a wolf conveys messages to ways in which native peoples imitated wolves when they hunted. At the same time, the authors teach concepts, including the interdependence of plant and animal species, the role of predators, and the importance of adequate habitat to the survival of species. By incorporating drawings and activities, they make the book appealing, and help children to understand and remember the material, and stimulate them to think.

Discovering Wolves is one of a series of nature activity books from Dog-Ear Publications. They are written by scientists who have taught, and are based on current research. Other titles include Discovering Northwest Volcanoes, Discovering Endangered Species, and Discovering Marine Mammals, each $3.95. —*Mary Byrd Davis*

Enculturation and Education

Four Books Help Show Us the Way

by Dolores LaChapelle

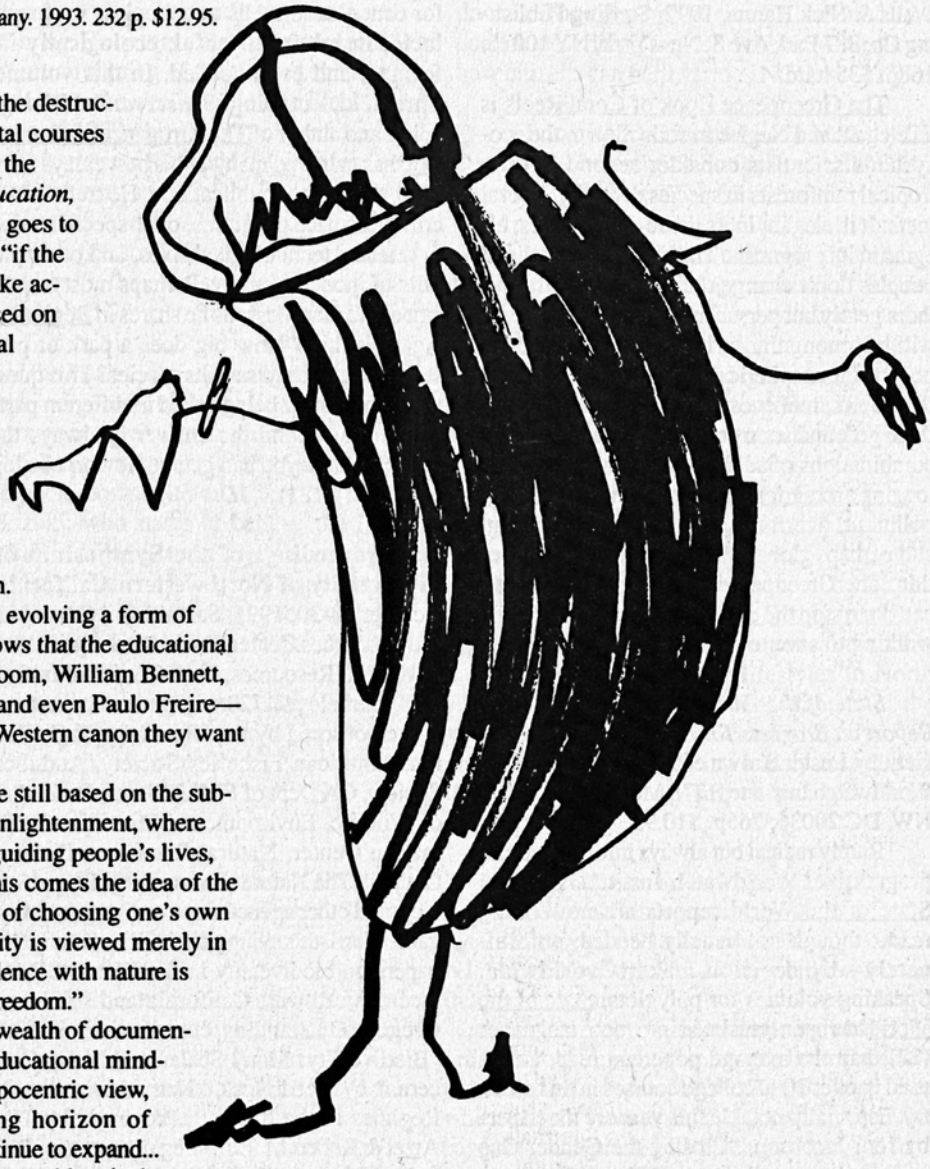
EDUCATION, CULTURAL MYTHS, AND THE ECOLOGICAL CRISIS: Toward Deep Changes

by C. A. Bowers. State University of New York Press, Albany. 1993. 232 p. $12.95.

Each year there are more studies concerning the destruction of the natural world; more environmental courses in colleges; more books being published on the subject...yet the destruction escalates. Why? In *Education, Cultural Myths, and the Ecological Crisis*, Bowers goes to the roots of the matter and gives us some answers: "if the thinking that guides educational reform does not take account of how the cultural beliefs and practices passed on through schooling relate to the deepening ecological crisis, then these efforts may actually strengthen the cultural orientation that is undermining the sustaining capacities of natural systems upon which all life depends." All standard institutional education, from elementary through graduate school, is trapped within this cultural way of thinking; thus education can not effect the necessary changes for the next generation. Bowers states that "The major crisis we face lies in evolving a form of culture that is ecologically sustainable." Yet, he shows that the educational reformers—Mortimer Adler, E.D. Hirsch, Allan Bloom, William Bennett, those currently revamping of John Dewey's ideas, and even Paulo Freire—"do not even mention the disjuncture between the Western canon they want to uphold and the ecological crisis."

Bowers explains that our thought processes are still based on the subject/object cleavage of Cartesian dualism and the Enlightenment, where "emphasis was given to the authority of reason in guiding people's lives, the belief in the inevitability of progress." Out of this comes the idea of the autonomous individual where "freedom is a matter of choosing one's own values, one's self-identity, and future." Responsibility is viewed merely in terms of self-interest, hence the idea of interdependence with nature is "viewed as an unwelcomed constraint to individual freedom."

In a brief review it is impossible to present the wealth of documentation he provides for his treatment of the present educational mindset, so I will just give a few examples. The anthropocentric view, he notes, leads to "living within an expanding horizon of possibilities...the range of consumer choices will continue to expand... ever-new technical solutions will be found." Another problem is that "the experimental relationship of science and technology to the culture is more like the momentary excitement of a promiscuous relation-



Brown Bear by Clay F. Noss (age 3)

ship—the attention of the scientist and technologist is short-lived (solving an immediate problem) and does not take into account long-term consequences of the changes that they introduce into the culture," and the "emphasis on the use of measurable evidence (what has been called the mathematization of experience) further erodes traditional authority."

The usual left/right or liberal/conservative political continuum does not represent real differences, Bowers shows. He turns toward an "ecologically responsive" attitude as seen in the writings of such people as Aldo Leopold, Gary Snyder, and Gregory Bateson.

I've been involved in educational reform since the late sixties but found that each reformer was actually part of the problem when it came to the environment. Then in 1978, Bateson wrote *Steps to an Ecology of Mind*; and ever since I've been trying with little success to get Bateson's ideas into the academic world. I was delighted to find that Bowers recognizes his importance. He quotes the famous Bateson statement: "The mental characteristics of the system are immanent, not just in some part [such as a rational individual] but in the system as a whole." Applying this to education, Bowers writes: "The total self-correcting unit is not the autonomous individual man but a flexible organism-in-environment."

Bowers asks "Why leading spokespeople for the emancipatory tradition in education liberalism—Paulo Freire, Ira Shor, Henry Giroux, Maxine Greene—have been so at ease with those aspects of modernism that are the greatest threat to the rest of the biotic community?"

Making his charges specific, he tackles the textbook industry. "As controversial images, facts, and interpretations will lead to exclusion from the list of state approved adoptions, the content of textbooks tends to represent the stock of knowledge, assumptions, and patterns of thinking shared by the politically and culturally dominant in society."

In Chapter 4, "Anthropocentrism in Textbooks," he lists seven necessary changes, ranging from "reframe the development of Western ideas from a self-congratulatory history of progress" to replacing "the idea of the student as rootless individual" with a bioregional knowledge of the place where that person is right now.

The basic mind set in the "public school view of science is that facts and information are the true building blocks of thought. If thought does not start with facts, information, data then it must be considered as fiction." Only certain forms of knowledge are recognized as legitimate. This leaves out all the other more ecologically valid ways of thinking, based on human experience for several hundred thousand years.

In cultures living in ecological balance, tradition "enabled people to live in time-space relationships that were symbolically rich and complex." Seasonal festivals, dance, song, bardic poetry—all of these "traditions filled the human need for meaning and transcendence over the mundane routines of daily survival in a way very different from our society, where we escape by moving physically through space—in the process contributing to pollution, depletion of nonrenewable resources and the spread of the freeway systems."

In the final chapter: "Dimensions of the Ecological Crisis," he goes deeper into our educational emphasis on one way of thinking: "The ground rules governing rational thought and by extension, the political process, prohibit the acceptance of other forms of cultural authority as the basis of belief and action...That is, the authority of traditions, [such as] the Australian Aborigine's songlines, which served over the millennia as both spiritual and geographical maps."

Daring to put down the worship of rational thinking in the education establishment is heretical enough, but Bowers will really get persecuted for tackling an even more dangerous topic—academic freedom. He states: "We need to frame how to think about academic freedom in terms of its contribution to an environmentally sustainable form of culture, rather than in terms of the myth of progress." "Should faculty be free (and supported by public resources) to pursue whatever line of inquiry they think important even if their inquiry leads to strengthening the cultural orientation of living beyond what can be sustained over the long-term by the habitat?" He mentions Jacques Derrida and other deconstructionists as "examples of how academic freedom is used to create a safe haven for intellectuals to build professional careers promoting nihilism...that can only strengthen the anomic form of individualism upon which our consumer-oriented society depends."

Going to the heart of a culture—spirituality—he says that the "modern Western form of spirituality (what Luckmann describes as the sacred cosmos of individualism) ...envisions the world as an arena for the expansion of human freedom, material standard of living, and personal wealth." Primal forms of spirituality do not have this limited perspective. "Being realists in a way modern industrial cultures are not, the different forms of primal spirituality appear to be oriented more to sustaining the balance of relationships into a future unlimited by an individual's own personal sense of time and immediate need." Primal cultures developed "languages of dance, art, music, and narrative as a means of sustaining their moral/spiritual sense of order." These aesthetic languages save the people and nature surrounding them from the destruction caused by the limitations of merely rational thinking. As Bateson says, "The rational hemisphere alone is necessarily pathogenic." These ceremonies are not spectator events but are participatory thus promoting relationship at every level. Furthermore, they do not need the vast expenditure of "resources" which modern entertainment requires.

He calls attention to the "possible connection of a culture that discounts relationships in favor of a form of atomistic vitalism (centering life within the individual rather than in her/his relationships) with the pathologies that are now endemic in society—drug dependency, mental illness, violence directed toward children and women, alienation, and so forth."

Bowers calls for a "curriculum that considers critically how past and current ways of knowing relate to the current ecological crisis." "Reform does not require a master plan before it begins; but it needs to be guided by a clear sense of the direction in which we must move, and a full awareness of the consequences if we fail."

To make this direction more obvious, I review below three books for small children. Since Earthday1990 the market has been flooded with books about "the environment" for children. In fact it's such a lucrative new marketing arena that the Wall Street Journal had a front page article about it. Most of the new books are worthless, but I have found three outstanding exceptions. Parents need to know about these books; now, within the context of Bower's book they assume even greater importance because enculturation begins long before schooling. Enculturation is more than education. As J. Wilbert once wrote: "[E]nculturation is the process by which the individual through informal and nonformal modes of cultural transmission learns the language, the technological, socioeconomic, ideational, as well as the cognitive and emotional patterns of culture. It is a life-long learning process that lasts from an individual's infancy to adulthood..."

WHO SPEAKS FOR WOLF

by Paula Underwood. A Tribe of Two Press, San Anselmo CA. 1991. 51p. $8.95. Illustrated by Frank Howell.

Our society's fundamental attitudes are mirrored very clearly in children's stories. Humanity's present attitude toward other species has resulted in two general types of animal stories for children: "cute" animal stories; and fables, where humans disguised as animals teach morals to children. In contrast, *Who Speaks for Wolf* shows that it is possible for humans to live fully only if they allow the same freedom to other species.

Wolf is a real Native American "teaching story" in the ancient sense. Underwood's great-grandmother left her Oneida home in 1800 when the Council decided to abandon their ancient traditions. She took refuge among the Quakers. Paula's father passed the traditional stories on to her but warned her not to tell them until she was 50, so this is her first book. Her traditional stories go clear back to when the tribe crossed the Bering Strait 10,000 years ago. Her book is typeset so that you automatically chant as you read it.

Underwood's story here begins with Wolf standing at the edge of the light and looking at the fire. Grandfather explains to the small boy why Wolf stands there: He begins:

"LONG AGO...LONG AGO...LONG AGO" and then tells of when the people grew so many they had to find a new place. They thought they had considered all things necessary but they forgot Wolf, until finally they realized this was the "Center place for a great community of wolves." They tried leaving food out for Wolf and other ways but none of these ways worked.

"THEY SAW
That it was possible
to hunt down this Wolf People
until they were no more"
But "such a task would change the People:
they would become Wolf Killers

IT DID NOT SEEM TO THEM
THAT THEY WANTED TO BECOME
SUCH A PEOPLE"

So they moved when winter was over and "they devised a way of asking each other questions...to remind us of things we do not yet see clearly enough to remember."

"TELL ME NOW MY BROTHERS
TELL ME NOW MY SISTERS
WHO SPEAKS FOR WOLF?"

GROWING WILD: Inviting Wildlife Into Your Backyard

Written and Illusrated by Constance Perenyi. Beyond Words Publishing.Inc., Hillsboro, OR 97123. 1991. 39p. $9.95.

This book is truly biocentric—focused on all of life. It begins:

Once upon a time
(not really long ago, really)
In a land far away
(not so far, actually—
maybe your neighborhood
or mine)
There was a perfect lawn...

The second page tells about all the other perfect lawns, "...proud to be perfect. But they were also very very lonely." Then one house is empty and up for sale; the unkempt garden attracts birds, squirrels, butterflies. When someone buys this house they "loved the creatures who kept the tall grass company," and they planted trees to "provide food and shelter." Next, "down came the fence and up went a long hedge" with plenty of treats for birds.

Later in the book comes the question: "And what, you might wonder, has become of all the other perfect lawns in the neighborhood? Well, nature has a wonderful way of taking care of friends: birds spread seed, squirrels bury nuts." And soon there are more flowers and birds and animals "So the neighborhood grows wild, too..."

In the back of the book Perenyi lists the animals that each specific plant (shown in full color in the book) attracts as well as further resources to create a Backyard Wildlife Habitat. Perenyi has a degree in Bird Biology from Cornell University.

It's important to understand the difference between anthropocentric (humans as the most significant entity of the universe) and anthropomorphic (ascribing human characteristics to nonhuman things). Many myths of primal traditional cultures make use of anthropomorphism; all entities are alive like us, so the way to begin relating to them is by human feelings.

Throughout the book the decisions are made by the non-human community members—first the grass, then birds, flowers, etc. and the children begin to understand that they are part of nature, too. The seasons change:

Birds as bright as autumn leaves
arrive in the garden.
Some stop for a short visit as
they fly south...

A small child is excited to see a bird that actually lives thousands of miles away stopping by her yard to eat enough to continue the journey.

The Wildlands Project, as outlined in the first Special Issue of *Wild Earth*, must continue for many years into the future. This book will help a small child begin to take part. Part of the mission of The Wildlands Project is "to begin to allow nature to come out of hiding and to restore the links that will sustain both wilderness and the spirit of future human generations."

To us it may seem unimportant to have wild plants growing in a yard, but for a bird who has stayed north too long and is caught by early snows, or arrives south too early, such seeds may mean survival. Silverton Colorado is at 9300 ft. More than once through the years, after a heavy early snow, I have shoveled off Shrubby Cinquefoil bushes to allow starving juncos to feed; after eating their fill they can fly down the valley to a lower altitude.

CHILDREN'S SPECIAL PLACES: Exploring The Role Of Forts, Dens, And Bush Houses In Middle Childhood

by David Sobel, M. Ed. Zephyr Press, Tucson AZ 1993.169p. $17.95.

If you are a parent or a teacher who cares about children, you must get this book not only for the child's sake but for what it inspires the child to do for nature. Sobel, who is co-chairman of the Antioch New England Graduate School of Education, writes:

Environmental education curricula often prematurely invite elementary teachers and students to get involved in global issues. Saving dolphins and rain forests is fine, but do children really have any sense of what this means? Authentic environmental commitment emerges out of firsthand experiences with real places on a small, manageable scale.

Sobel states that "middle childhood" is a "critical period" in the development of the self and in the individual's relationship to the natural world. This book, growing out of Edith Cobb's work, is the first to provide a teacher with everything needed to fight the authorities to begin such a program.

After his original work in this country, Sobel went to a village school in England for a year to help set up such a program and then spent a year in Carriacou in the West Indies. He found the same pattern in all three countries. Sobel reconceptualizes elementary education around the collective unconscious of children and what they most want to do.

He gives examples from ongoing long-term projects. One especially important for all of us who care about nature takes place at the Soulé School in Southport Maine. Forts have been built there for 25 years. "Over the years an autonomous children's culture has been allowed to evolve, almost completely independent of adult or teacher intervention." He quotes from Patric Maynard's work about the relationship between the forts and the development of the children's environmental action group named CAKE (Concern About Kids' Environment) which was born at this school. The kids campaigned successfully to get the town to pass an ordinance banning styrofoam. Since then CAKE chapters have started at schools throughout New England.

The adults who encourage the dens, forts and bush houses understand that no adult should ever enter them unless invited by the kids. Some people would say the kids will fight and hurt one another; but in fact, the kids become "calm and self-directed."

Paul Shepard, who teaches Human Development at Pitzer College in California, wrote a jacket blurb for Sobel's book: "At last someone has made this subject—familiar but unformulated by most of us—clear, urgent, and workable. The special quality of this book is that as adults who intuitively recognize the significance of place we can now understand how, as teachers, to make it part of education."

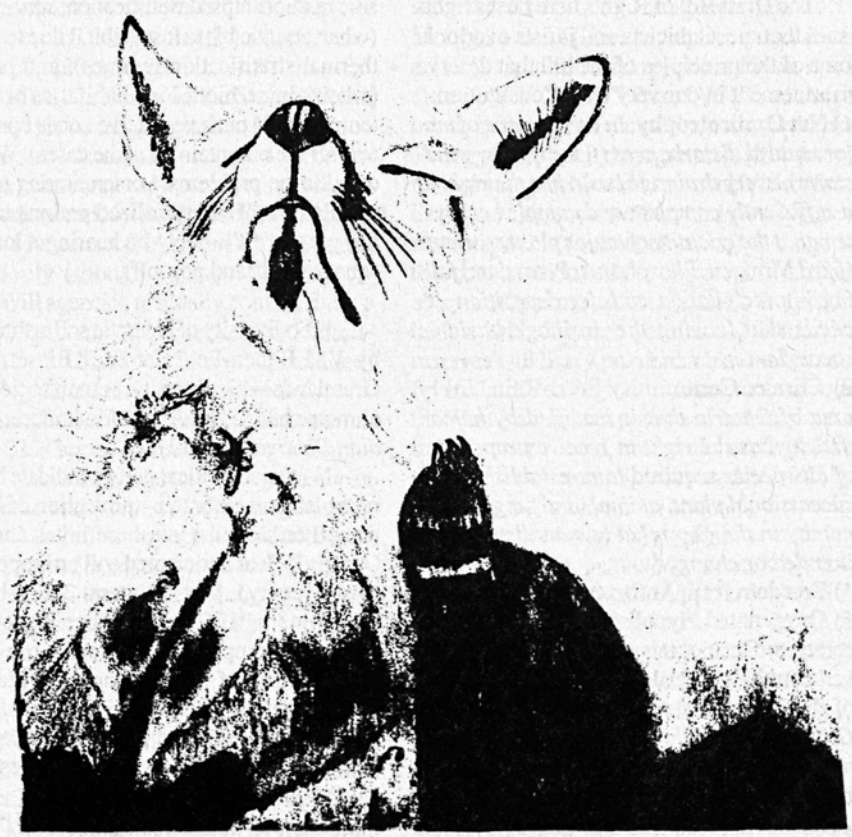
To show just how important the above books are in our efforts to save the environment, I want to quote Paul again, this time from his book, *Nature and Madness*, where he shows, historically, how "nature hating" developed in our culture and how environmental destructiveness comes out of a society that does not provide what children need for normal development.

What can one say of the prospect of the future in a world where increasing injury to the planet is a symptom of human psychopathology? In some ways the situation is far more hopeful. An ecologically harmonious sense of self and world is not the outcome of rational choices. It is the inherent possession of everyone; it is latent in the organism, in the interaction of the genome and early experience...The phases of such early experiences, are the legacy of an evolutionary past in which human and non-human achieved a healthy rapport.

Shepard explains that modern societies have dropped some of the stages primal cultures had for children and that our modern societies "are themselves the product of such amputations and so are their uses and abuses of the earth. He continues:

Perhaps we do not need new religious, economic, technological, ideological, esthetic, or philosophical revolutions. We may not need to start at the top and uproot political systems, turn life-ways on their heads...The civilized ways inconsistent with human maturity will themselves wither in a world where children move normally through their ontogeny... The problem may be more difficult to understand than to solve. Beneath the veneer of civilization, to paraphrase the trite phrase of humanism, lies not the barbarian and animal, but the human in us who knows the rightness of birth in gentle surroundings, the necessity of a rich nonhuman environment, play at being animals, the discipline of natural history...There is a secret person undamaged in every individual...

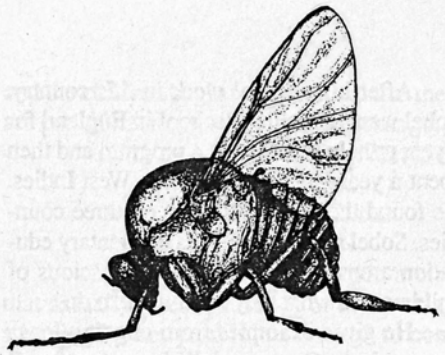
Reviewed by Dolores LaChapelle, Director, Way of the Mountain Center. All three children's books are available from Way of the Mountain Center Orders, POB 2434, Durango, CO 81302; or call 800-578-5904. Add $2 postage for each book; $4 for all three.



Red Fox by Sam Balling (age 13)

Noteworthy Articles

A Look at Conservation Literature



by John Davis

"Draft of an Environmental Bill of Rights for Ontario," by Frederick Schueler; ***Sea Wind***, April-June 1992.

Sea Wind, the quarterly bulletin of Ocean Voice International (membership $25/yr; Ocean Voice International, 2883 Otterson Drive, Head Office, Ottawa, Ontario K1V 7B2, Canada, attn: Dr. Don McAllister, President & Editor), always pays special attention to the over-exploited: "Women for a healthy planet!," "Taking local action to protect forests in the Philippines," "The coral and mollusc report," and "Sea urchin harvesting in the Philippines" are among articles this issue dealing with exploited groups trying to resist industrial incursions.

The Draft Bill of Rights here raises rights issues that most ethicists and jurists overlook. Some of the principles of the bill that deserve enshrinement in our very own Constitution:

1) **Net Ombrotrophy**. *In the absence of major natural disturbances (floods, fires, windstorm), every drainage basin has the right to a sufficiently complete and complex ecosystem that the quantity of major plant nutrients (fixed Nitrogen, Phosphorus, Potassium) falling in precipitation and dry deposition exceeds that leaving the drainage basin in streamflow....*

2) **Climax Community Seed Rain**. *Every area of Ontario that is modified by human activity has the right to receive propagules of all species required to re-establish a late successional plant, animal, and fungal community in the event that human disturbance is ended or changed....*

4) **Freedom from Anthropogenic Toxins**.

5) **Oxygenated Hypolimnion**. Dropping reference to Ontario, this one should be adopted verbatim by a special Constitutional Congress of the United States. *Every dimictic lake in Ontario has the right to an oxygenated hypolimnion throughout the summer and winter, and the right to curtailment of pollution and anthropogenic eutrophication when these threaten such oxygenation of the hypolimnion....*

7) **Escarpment Corridors.** Cliffs have rights!

8) **Freedom from Introduced Species**.

"How global warming affects species survival," by Don McAllister & Kenneth Dalton; ***Canadian Biodiversity***, summer 92.

The fledgling quarterly of the Canadian Centre for Biodiversity (Canadian Museum of Nature, POB 3443, Station D, Ottawa, Ontario KIP 6P4; $25 yr) is quickly establishing itself as a key source of informative articles on neglected environmental topics. This greenhouse article discusses indirect effects of anthropogenic global warming that are seldom acknowledged. These include disruptions of symbiotic, predatory, competitive, and parasitic relationships; desertification; *squeeze-outs* (when aquatic biota lose habitat due to altered thermal stratification regimes), and *pop-offs* (when alpine biota lose habitat as warming temperatures push vegetative zones upward—and off the mountain, in some cases). Whether or not acne problems worsen among teenage populations of industrialized nations in coming years, you'll likely be hearing a lot about squeeze-outs and pop-offs.

"Biodiversity of Nearctic soil arthropods" by VM Behan-Pelletier & B Bisset, "Arid Grasslands—biodiversity, human society, and climate change" by Albert Finnamore; *Canadian Biodiversity*, fall 92.

No major political party candidate has run on a platform embracing protection of Nearctic soil arthropods; yet these mites and ticks (Acari, 35% of anticipated soil arthropod species diversity), flies (Diptera, 31%), beetles (Coleoptera, 17%), and other insects and arachnids comprise huge proportions of the total number of species and individuals in North America. Entomologists expect that almost 50,000 arthropod species inhabit North American soils, though they have described only about half these.

The grasslands article recaps how the vast bulk of Canada's arid grasslands ecosystem was ruined (by agriculture, livestock, mining, etc.). Then it explains why these communities are highly sensitive to climatic change and will likely fare poorly under anthropogenic warming.

"Weeding the Garden," by Andrew Neal Cohen; ***The Atlantic Monthly***, 11-92.

Beginning with a description of Fish & Wildlife Service biologists setting out poisoned bait to kill gulls to save eiders in the Gulf of Maine, Cohen broaches an uncomfortable subject: Due to human introductions of exotic animals, habitat destruction, disruption of natural predator-prey cycles, and other anthropogenic factors, wildlife managers often now face the choice of eradicating an alien predator or watching native populations plummet. Examples of conflicts engendered or exacerbated by humans include Red Foxes versus Least Terns and Clapper Rails on California's coast, Coyotes vs San Joaquin Kit Foxes in California's San Joaquin Valley, Arctic Foxes vs Aleutian Canada Geese on islands in Alaska, Coyotes vs Whooping Cranes in Idaho and Greater Sandhill Cranes in Oregon, Common Ravens vs Desert Tortoises in California's Mojave Desert, Mountain Goats vs rare alpine plants in Washington's Olympic National Park, Brown Tree Snakes vs native birds on Guam, and of course cowbirds vs songbirds (cows against songs?) throughout the fragmented temperate forests of North America.

Point/Counter Point: "Gender Bias: Roadblock to Sustainable Development" by Jodi Jacobson vs "The World's Women: Fighting a Battle, Losing the War" by Virginia Abernathy; ***Focus***, vol.3#1, 1993.

The Carrying Capacity Network's quarterly (*Focus*, CCN, 1325 G St, NW Suite 1003, DC 20005; $20/yr) regularly features debates on difficult population problems, by experts who are otherwise allied in their efforts to stop the human population explosion. This time, Worldwatch Institute researcher Jodi Jacobson argues that overcoming the overpopulation

Blackfly by Jeff Elliot

crisis necessitates, first and foremost, ending the oppression of women. In contrast, anthropologist and psychiatry professor Virginia Abernathy argues that diverting population program monies to programs to empower women would be counter-productive, since overpopulation is a cause—not consequence—of the oppression of women. (I would here take my normal stand against dualism and argue that overpopulation and oppression of women are mutually reinforcing problems; each is a cause, each is a consequence.)

"SLAPPs Surge North: Canadian Activists Under Attack," by Kim Goldberg; ***The New Catalyst*** (POB 189, Gabriola Island, BC VOR 1X0), winter 92/93.

This free quarterly—co-sponsored by Friends of Clayoquot Sound, Friends of the Tsitika, Green Web, Sierra Club of Western Canada, Western Canada Wilderness Committee, and other leading Canadian environmental groups—always offers important information to advocates of Canada's natives. Kim Goldberg and other activists here describe how transnational timber companies are now using in Canada a tactic that has proven successful in the US for intimidating activists: strategic lawsuits against public participation.

Brazil of the North: The National and Global Crisis in Canada's Forests, 1-93, produced by Canada's Future Forest Alliance, Box 224, New Denver, BC Canada VOG 1S0.

This tabloid graphically gives the grisly details of the denudation of Canada. Timber cutters—mostly transnational timber companies—are clearing over a million hectares a year of Canada's forests. Only 2.6% of Canada's forest is officially protected; most is slated for harvest and export, to Japan, the US, and elsewhere. Particularly helpful is Stan Rowe's article, "Boreal Forest in the Global Context."

"Static Paradigms, Dynamic Ecosystems, and the Future Direction of BC Conservation: A Critique," by Evan Frost & Mitch Friedman; ***Forest Planning Canada***, 9(1) (POB 6234, Stn C, Victoria, BC Canada V8P 5L5).

Our friends at Greater Ecosystem Alliance employ conservation biology principles (which they've been using to advance preservation in Washington's North Cascades) to show how land management practices in British Columbia are fundamentally flawed. One flaw made by foresters in BC (and elsewhere) is seeing ecosystems as static; failing to appreciate the inherent dynamism of ecosystems, as manifested in wildfires, blowdowns, insect epidemics, and other ecological and evolutionary processes.

"Applying the Biosphere Reserve Concept to a Greater Ecosystem: The San Juan Mountain Area of Colorado and New Mexico," by Tony Povilitis; ***Natural Areas Journal***, 1-93. (To join Natural Areas Association, send $25 to NAA, 320 S Third St, Rockwell, IL 61104.)

Tony elaborates upon the San Juan Biosphere Reserve model he suggested in *Wild Earth* several issues back. With 66,000 square kilometers, 62% public ownership, a human population density of less than 2.5 people per square kilometer and road density of a comparatively low 0.5 km/km2 for the South San Juans, several sizeable Wilderness Areas, and surviving populations of most native species (with Bison, Black-footed Ferret, Gray Wolf, River Otter, and possibly Wolverine, Lynx, and Grizzly Bear needing reintroduction or augmentation), the Greater San Juan Mountain Area affords conservationists an ideal opportunity to establish and (finally) make meaningful a Biosphere Reserve.

Read also in this issue the State Reports. Note a couple trends of concern: 1) Peregrine Falcon reintroduction efforts seem to be focused on urban areas. (Natural heritage biologists in Indiana and Nebraska are re[?]introducing Peregrine Falcons to Indianapolis and Omaha, respectively [though perhaps not respectfully].) Will agencies gradually convert Earth's fastest raptor into another urbanized domesticate? 2) State, Nature Conservancy, and federal biologists are embarking, more and more, on joint (federal-state-private) efforts to secure habitat. This seems necessary and good overall, but could engender undue optimism in some cases and places. (The average reader will see little difference between full fee purchase of needed lands and mere easement purchase on such lands, even though the latter would allow continued exploitation—usually in the form of clearcutting.)

"Human Population Control: The Missing Agenda" by Gary Meffe, Anne Ehrlich, & David Ehrenfeld, "Przewalski's Horse: Prospects for Reintroduction in the Wild" by Oliver Ryder [loosely speaking; actually, Ryder himself would probably neither reintroduce nor ride the horse], "The Limits of Caring: Sustainable Living and the Loss of Biodiversity" by John Robinson, "Can Extractive Reserves Save the Rain Forest? an Ecological and Sociological Comparison of Nontimber Forest Product Extraction Systems in Peten, Guatemala, and West Kalimantan, Indonesia" by Nick Salafsky, Barbara Dugelby, & John Terborgh, "What Exactly Is an Endangered Species? An Analysis of the US Endangered Species List: 1985-1991" by David Wilcove, "Determining Minimum Habitat Areas and Habitat Corridors for Cougars," and "Channel Migration and Vegetation Patterns in the Southeastern Coastal Plain by David Shankman; ***Conservation Biology*** (Blackwell Scientific Publications, 238 Main St, Cambridge, MA 02142; $49), March 93.

Let's briefly recapitulate (to the extent possible without ever having capitulated and without adequate space): Scientists are paying far too little attention to overpopulation, as evidenced by the complete lack of submissions on the subject to *CB* so far during its first 6 years. The Asian Wild Horse (Przewalski is dead and unpronounceable) may soon be reintroduced to the Dzungarian Basin of Mongolia and China, as captive populations are now sizeable. *Caring for the Earth*—produced by IUCN, UNEP, and WWF, and serving as successor to their *World Conservation Strategy*—represents a regrettable shift among mainstream world environmental leaders from the view that conservation and development are compatible (a dubious claim) to the view that conservation and development (if sustainable) are the same process (a claim that would be laughable if not so pernicious). Extractive reserves will likely prove much more successful in the Peten region of Guatemala than in the West Kalimantan portion of Indonesia, due to different political, economic, ecologic, and sociological factors. Species on the T & E list are being added too late, and only 5 species have recovered after listing. Habitat corridors allow Cougars to survive in areas that would otherwise be too small to support viable populations, studies in the Santa Ana Range of southern California suggest. Channelization projects in the Southeastern Coastal Plain work against early successional forests and thereby decrease diversity.

"Pistil-packing Flies," by Carol Kearns & David Inouye; ***Natural History*** (POB 3030, Harlan, IA 51593; $22/yr), 4-93.

Flies are under-appreciated (by biologists, not flowers) as pollinators. Kearns and Inouye found flies to be even more important as pollinators of Rocky Mountain alpine meadow flowers than are butterflies, bees, hummingbirds, and moths.

Special Section: Biotechnology & Ecology, ***The Amicus Journal***, spring 93 (NRDC, 40 West 20th St, NYC, 10114; $10 or more/yr).

NRDC's quarterly this time includes a section on a topic receiving far too little attention from environmentalists: genetic engineering. Unfortunately, only a few groups are fighting this new technology, most notably Jeremy Rifkin's effective though insipidly named Foundation on Economic Trends. See especially the articles by Dick Russell and Wes Jackson. As they make plain, concerned citizens should look askance at the needless multiplication of prefixes and suffixes ('bio' does just fine without 'techné').

"Restoration and Rehabilitation of Degraded Ecosystems in Arid and Semi-Arid Lands: A View from the South" by J. Aronson et al., "Tidal Marsh Restoration: Trends in Vegetation Change Using a Geographical Information System" by Nels Barrett & William Niering, "Small-Scale Wetland Restoration in the High Arctic: A Long-Term Perspective" by Bruce Forbes; ***Restoration Ecology*** (Blackwell Scientific Publications, 238 Main St, Cambridge, MA 02142; $65/yr for 4 issues), March 93.

Restoration Ecology is the second periodical to come from the Society for Ecological Restoration (UW, Madison Arboretum, 1207 Seminole Hwy, Madison, WI 53711), the first being the biannual *Restoration & Management Notes*—which can no longer accommodate all the articles in this burgeoning field. As with *R&MN*, the pages are occasionally laden with theory and formulae, but important anyway for habitat proponents.

This first issue has several articles especially useful for wildland advocates: Aronson et al. discuss thresholds of irreversibility in the human-induced degradation of ecosystems, and other crucial considerations in rehabilitating or restoring ecosystems. Barrett & Neiring (the latter, *RE*'s Editor) explain how a GIS was used to map the recovery of a tidal marsh in Connecticut's Little Narragansett Bay; finding that removal of tidal flood impoundments allowed native vegetation to return, but in a pattern different from that before impoundment. Forbes finds that bryophyte sods can be successfully transplanted to restore vehicle-rutted High Arctic wet sedge-moss meadows; though again, recovery was incomplete, even after 18 years.

"Frog in the Night-time: The Strange Case of the vanishing amphibians" by David Quammen, "James Hansen, Getting Warmer" by Bill McKibben"; ***Outside***, 5-93. Always I feel sheepish recommending *Outside* articles while I sit in this cold office donned in mere wool; but I own no licra.... Regardless, *Outside* has a top-notch columnist in David Quammen. This time in his Natural Acts, Quammen professes to be an ignoramus with regard to amphibians—whose plummeting populations are befuddling biologists—then advances a hypothesis (indirectly: Quammen is too wise and circumspect to directly challenge experts in another realm). He leads us to know that the shockingly sharp declines of amphibians being reported almost world-wide may be largely due to human-caused habitat fragmentation in combination with amphibians' natural tendency toward extreme population fluctuations. Emboldened by Quammen's adventurousness, I'll venture my own hypothesis: Quammen will be proved right. Scientific reports a few years hence will reflect the view that amphibian declines are due to various and cumulative and synergistic anthropogenic factors—including pollution, introduction of exotic species, and perhaps global warming, but especially habitat fragmentation interacting with the sharp population fluctuations common in this ancient class.

Weather, too, displays fluctuations. (Will we ever forgive our English composition teachers for demanding transitions when opening new paragraphs?!) Bill McKibben, author of *The End of Nature*, revisits the issue of anthropogenic global warming ... and finds the evidence even more compelling than when he wrote his book. NASA scientist James Hansen shocked the country 5 years ago when he testified before Congress on global warming. Critics have rejected his global climate model (he's a computer dweeb); but, alas, the model is looking sound in its prediction of the temporary cooling effects of Mt. Pinatubo's eruption.

"Shorebird Squeeze" by Joanna Burger, "What Are Men Good For?" by Jared Diamond; ***Natural History***, 5-93.

Burger discusses how human development and recreation on Atlantic beaches is adversely affecting shorebirds—especially solitary nesters, including oystercatchers, willets, and Piping Plovers. In recent years, some shorebirds have increased the amount of feeding they do at night, so as to avoid people; but now more and more people are visiting beaches at night—to avoid people....

Of course, men are mostly to blame. Recent anthropological studies suggest that women have generally been providers—gathering enough food to feed themselves and their offspring; whereas men have generally been showoffs—hunting big game so that they might ... (how to say this gracefully?) commit adultery more often. (Obviously, this review leaves unmentioned most steps in the line of logic [which logic leads to muscle wagons on beaches]; but can you blame the reviewer? He is afflicted with the Y chromosome!)

"An Ecological Development Plan for the Palouse Region," by Alan Wittbecker; ***Pan Ecology*: An Irregular Journal of Nature and Human Nature** (GP Marsh Institute, POB 1, Viola, WA 83872), winter 93.

Ecologist Alan Wittbecker offers a brief natural history of the Columbia Basin's 6 million hectare dry intermountain grassland. After estimating the region's human carrying capacity at less than half its present population of almost 700,000, and its optimum population much smaller still, he suggests how Palouse ecology and human economy might be made compatible. His plan would begin to protect the Palouse's 40 habitat types in 9 zones by establishing a 1.1 million hectare Palouse reserve, buffered by 1.3 million hectares of rehabilitated fields, and about 25 small satellite areas.

"Ecosystem Ecology and Metaphysical Ecology: A Case Study," by Karen Warren & Jim Cheney; ***Environmental Ethics***, summer 93 (Environmental Philosophy Inc, Chestnut Hall, Suite 14, 1926 Chestnut St, U of North Texas, Denton, TX 76203; $36/yr).

Once in a great while, an article appears that edifies and establishes common ground between disparate disciplines. *Environmental Ethics* presented such an article years ago when it ran "Physical Matter as Creative and Sentient," which helped conjoin aspects of new physics and ethical ecology. Here *EE* presents an equally profound interdisciplinary exposition, which will enlighten both scientific and philosophic ecologists (even though their article is, in part, devoted to showing that J. Baird Callicott's understanding of ecosystem

ecology does not form an adequate basis for an environmental metaphysics). Among their many other key ideas, Warren & Cheney suggest that the dichotomy is false between species/community and process/functional perspectives on the natural world. To attempt a brief elucidation of part of their paper: Nature displays both continuity and flux, equilibria and non-equilibria, stability and change, individual autonomy and community synergy ... depending on the "observational set" employed—what natural phenomena one observes and over what spatio-temporal scale.

"The Lonely Struggle of John Davis: Did an Oil Company Turn his Ranch into a Swamp?" by Alston Chase; ***HomeFront***, spring 93 (*HomeFront*: The Life and Times of Montana's Rocky Mountain Front, Box 8442, Missoula, MT 59807).

Sure as hell did; and I'm peeved. No, seriously, this is a different John Davis, and "The Lonely Struggle" is not the article I recommend. Rather, I recommend you read "Frontlines" and "Background," which explain the threats to this new newsletter's main constituent, the Rocky Mountain Front—the half million or so acre area in the Northern Continental Divide Ecosystem where the Great Plains meet the Rocky Mountains. Oil & gas drilling is an imminent threat, which you might help avert by donating to Rocky Mountain Front Advisory Council at the above address, and by writing to your elected officials urging them to support Wilderness designation for the Badger/Two Medicine roadless area and other wild parts of the Front.

"On the USFWS Settlement Regarding Federal Listing of Endangered Species" by Eric Glitzenstein, and "A Status Review of State Threatened and Endangered Species Programs and the Massachusetts Initiative," by Curtice Griffin & Thomas French; ***Endangered Species Update***, 3-93 (*ESU*, School of Natural Resources, U of Michigan, Ann Arbor, MI 48109; 10/yr for $23).

Attorney Glitzenstein describes the victory won by Biodiversity Legal Foundation, Fund For Animals, and grassroots environmentalists for imperiled species. (See "Interior Dept to Expedite Federal Protection for Hundreds of Imperiled Species Under the ESA," *WE*, spring 93, p.23.) Glitzenstein concludes that the best thing Congress could do for endangered species "is provide Interior Secretary Bruce Babbitt ... with the resources that he needs to *both* efficiently list species *and* accomplish the other herculian tasks imposed on him by the Act, such as drafting meaningful recovery plans and designating critical habitat."

Griffin & French give a brief overview of state endangered species programs. A recent survey indicates that most states have endangered species programs, but they vary greatly in their number of species and teeth.

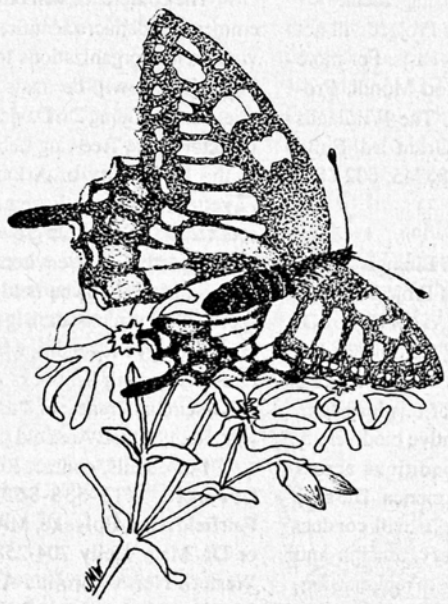
"Wolves in Maine—Time for Return of the Native" by Michael Kellett, "Cultural Restoration: The Key to Ecological and Economic Sustainability" by Jamie Sayen, "Northern Forest Real Estate Bargains" by the Northern Forest Alliance, "When a Forest Falls, the Ocean Listens" by Ron Huber, "Atlantic Salmon—A Species on the Brink of Extinction" by David Carle, "National Marine Sanctuaries—The New England Experience" by Ron Huber, "Good and Bad News for Adirondack Park" by John Sheehan, "The Ancestral Forest" [of Maine] by Charles Cogbill, plus provocative pieces by Mitch Lansky, William Jordan III, Lowell Krassner, and others; ***Northern Forest Forum*** (POB 6, Lancaster, NH 03584; $12/yr), Mud Season 1993.

The latest issue of this nascent tabloid is the best yet. (Subscribe and contribute extra if you can.) Excellent articles, especially the above, paint pictures of the North Woods as they were and as they again should be. All bioregionalists should read Jamie Sayen's suggestions on how to build a culture that is truly sustainable both ecologically and economically.

"After the Rain," by Franklin Rosemont; ***WHAT Are You Going to Do About It?*** #2, 4-93.

WHAT ... is an occasional publication of Chicago's Surrealist Group (c/o Black Swan Press, POB 6424, Evanston, IL 60204). Trenchant critic of the industrial state Franklin Rosemont, in this second number, offers an ecological perspective on the Los Angeles riots. You probably heard on network news nothing like this:

The long-range significance of the L.A. rebellion cannot be appreciated apart from the global ecological crisis.... In this era of massive destruction of rainforests and other wild places, the contradiction between city and "countryside" has become central to all struggles for social change. Anyone who knows the ABCs of ecology knows that massive restoration of wilderness is today an urgent priority, second to none—indeed, the precondition for the continuation of life on this planet—and that such restoration requires, in turn, massive dismantling of industrial society's deadly cities. In this light, the festive community burning of L.A.'s shopping malls can be regarded not only as a sensible response to unlivable ghetto conditions, but also as an ecologically sound step toward doing away with America's poisonous urban wastelands...



Swallowtail by Jennifer Wiest

Announcements

TWP Staff Vacancies

The Wildlands Project seeks an office manager/administrator. Responsibilities include keeping the organization's books and records, payroll, responding to inquiries, and maintaining the clearinghouse database. Excellent communication skills, both verbal and written, and computer skills needed. Fluency in both English and Spanish helpful. Salary negotiable, commensurate with experience. Medical benefits. Contact TWP office in Tucson.

Wildlands Internship

The Wildlands Project Clearinghouse is looking for interns. Interns should possess basic office skills, familiarity with computers (Mac), and excellent research skills. Ability to use basic mapping software would be a plus, as would good communication skills and a decent sense of humor (humorous misanthropes encouraged). A deep understanding and love of wild things and wild places, and familiarity with wilderness issues and environmental policy are mandatory. Interns will perform basic office tasks, but will also have a chance to work on directed research in the fields of restoration ecology, human ecology, conservation biology, and resource management.

The Wildlands Project will not discriminate on any basis. For more information call Rod Mondt, Programs Coordinator, The Wildlands Project, 1955 W. Grant Rd. Suite 148A, Tucson, AZ 85745; 602-884-0875.

Staff Conservation Biologist

The Wildlands Project seeks a STAFF CONSERVATION BIOLOGIST. Reporting to the Science Director, the biologist will manage the scientific program of this long-term project to restore native biodiversity and wilderness conditions across North and Middle America. The staff conservation biologist will conduct workshops on reserve design and other topics relevant to regional conservation planning; initiate, conduct and supervise preparation of map-based conservation plans; and correspond with conservation groups, scientists, press, and the general public about TWP.

QUALIFICATIONS: PhD in ecology or related field, with emphasis on conservation. Excellent organizational and communication skills. Peer-reviewed publication record. Experience in field biology, biological inventory, reserve design, geographic information systems or other mapping, and conservation politics. Strong personal commitment to biocentric conservation. Salary commensurate with qualifications. Send cover letter and c.v. to Reed Noss, Science Director, The Wildlands Project, 7310 NW Acorn Ridge, Corvallis, OR 97330.

Eastern Old-Growth Conference

May 26-28 a conference devoted to old-growth forest in the eastern United States will be held at the University of North Carolina at Asheville. The purpose of the conference will be to: 1) explore the values of Eastern old-growth ecosystems, 2) consider the variety of definitions being used for old-growth, 3) introduce old-growth researchers and their work, 4) discuss management and preservation issues.

The conference will bring government, academic, scientific, and environmental organizations together. Presentations will be made by key scientists including Dr. David Stahle, Director of the Tree-ring Laboratory at the University of Arkansas at Fayetteville. Dave Foreman will speak to the value of old growth from the perspective of the environmentalist. Field trips will be held to two spectacular locations: the Big Ivy area of the Craggy Mountains, which features old-growth hemlocks over 14 feet in circumference; and the Black Mountain Natural Area old growth.

For details, contact Robert T. Leverett, 413-538-8631, 52 Fairfield Ave., Holyoke, MA 01040 or Dr. Mary Kelly 704-258-8737, Western North Carolina Alliance, 70 Woodfin Place, Suite 03, Asheville, NC 28801.

Activist's Handbook on Conservation Biology Available

Greater Ecosystem Alliance conservation biologist Evan Frost has compiled a mass of information needed by forest defenders everywhere.

To better inform grassroots activists about the importance of conservation biology and its application to public land management, the Greater Ecosystem Alliance has published "Conservation Biology and National Forest Management in the Inland Northwest: A handbook for activists." The handbook brings together a wealth of scientific information on biodiversity, in a digested form accessible to non-scientists.

Twelve sections cover topics ranging from landscape ecology and habitat fragmentation to forest health and fisheries. Each section includes an annotated bibliography and a list of issues to consider when reviewing Forest Service planning documents. Although the geographic emphasis is on the forests of the Cascades and Northern Rockies, much of the material is relevant to National Forest management in general.

The 250 page handbook is available from Greater Ecosystem Alliance, POB 2813, Bellingham, WA 98227, for $17 plus $3 for shipping and handling.

North American Temperate Forest Conference

Eminent Canadian zoologist David Suzuki will be the keynote speaker for the First North American Temperate Forest Conference, on the campus of the University of Vermont, hosted by the Native Forest Network (NFN) in Burlington, VT. It will convene on Thursday, November 11, with a presentation by Dr. Suzuki, and continue through November 14. The conference will have other speakers, bioregional reports, and working discussion circles intended to cohesively define directions for campaigns and actions on this continent. The conference intends to bring indigenous people, forest dwellers, forest activists, conservation biologists and non-governmental organizations (NGOs) together for the first time in North America. Environmental musicians Alice DiMicele and Dana Lyons will provide entertainment.

The NFN sees a wide disparity between national environmental NGOs and local and regional NGOs on forest campaign positions, and believes the forest movement needs to create a unified body capable of protecting and restoring native forests on national and international levels. The conference in Vermont will allow the opportunity to discuss this concept of a global umbrella for the forest movement.

Prior to the conference an educational Roadshow promoting NFN will visit selected cities in North America, starting in September. (See accompanying announcement.) For more information, please contact: Eastern North American NFN, Orin Langelle, POB 57, Burlington, VT 05402; (802)658-2403 or FAX (802)863-2532.

Native Forest Network Roadshow

NFN's cross-country roadshow is intended to increase coordination between activist groups and individuals on temperate forest campaigns and provide an overview of current international forest hotspots. Please contact NFN. *-Jake Jagoff, Phil Knight, Orin Langelle, Suzanne Pardee, NFN c/o POB 5176, Missoula, MT 59806*

Bike For The Dacks

Join the *Wild Earth* staff and other Adirondack proponents to help protect the Adirondacks at the Dacks Bike-a-Thon on Saturday 25 September 1993. The bike-a-thon will start at University of Massachusetts at Amherst, Lot 62, across from the Fine Arts Center at 9am. The fee to enter is $10 minimum, and registration begins at 8am All the money raised will go directly to Buy Back The Dacks. Participants are encouraged to solicit sponsors for their ride. Courses of 15, 40, and 60 miles will be offered, taking riders through the magnificent Berkshire Mountains. Food and water will be provided, and sag wagons

in case of breakdowns. For more informaton contact Celeste Poulin 413-538-4031 or Linda Gauthier 413-533-9182.

Wildlands Anthology

Efforts are under way to assemble a Wildlands Project anthology of writings on culture and wilderness. Slated for publication next winter, the collection of original essays will focus on the culture/wildlands interface: wilderness as territory and the notion of limits, the role of humans vis a vis wild lands, etc. Whereas, *Wild Earth* centers on issues of biodiversity, the first issue of the anthology, according to editor David Burks of Eugene Oregon, will focus on the challenges posed to wilderness recovery from the actions and values of human habitation. The anthology is slated to be an annual publication of The Wildlands Project.

Updated Preserving Family Lands

Tax attorney and writer Stephen Small has revised and updated Preserving Family Lands. (See Wild Earth vol. 3, #1, Other Recommended Titles for review of first edition.) The second edition explains current tax rates, estate tax rates, and alterations of tax laws affecting private lands. The book is available for $8.95 plus $3 for postage and handling. Make checks payable to Landowner Planning Center and send to: Landowner Planning Center, POB 4508, Boston MA 02101-4508. (617) 728-9799.

Overgrazing Slide Show

"The Eating of the West" graphically displays the devastation of Western public lands at the hands (and hooves) of the livestock industry. The show consists of over 100 slides from National Forests, National Wildlife Refuges, and BLM land that portray the shocking magnitude of the problems caused by livestock grazing. The slide show comes with a written script and is rented at cost, $10. Orders should include the name and phone number of a contact person, the date the show is needed (as well as alternates), and a street address for UPS delivery. Order from The Ranching Task Force, POB 41652, Tucson, AZ 85717.

Institute on Trade Policy

The Institute on Trade Policy is dedicated to the worldwide exchange of information among environmental, human rights, labor, and sustainable economics activists and organizations, on issues relating to international trade and multinational corporations, with the hope of promoting coordination between activists in developed and developing nations. The Institute provides: 1) profiles of specific corporations and the environmental and social impacts of their projects; 2) papers on international trade, especially the natural resource industries; 3) directories, information guides, and "how to" packets for researching multinational corporations. Its directory *Wasting the Planet* details the activities and locations of multinational corporations.

All publications are available by subscription or single purchase. Custom research is also available on a sliding-scale fee basis. Institute of Multinational Corporate Activities, POB 389, Seattle, WA 98111-0389, Telephone/Fax 206-783-5009, Econet: itp@igc.apc.org.

The Association for the Study of Literature and Environment

The Association for the Study of Literature and Environment (ASLE) recently formed to promote the exchange of ideas and information pertaining to the study of literature and the natural world. The organization's broad focus includes natural history writing, environmental fiction, and nature poetry. ASLE's goals are to provide a network for interested scholars, to foster interdisciplinary discussion on the subject of literature and the environment, and to facilitate research.

Annual membership dues—entitling members to all mailings about ASLE activities, to participation in ASLE-sponsored conferences, and to a copy of the ASLE directory—are $10 ($5 for students). Two publications are associated with ASLE: *The American Nature Writing Newsletter* and *ISLE: Interdisciplinary Studies in Literature and Environment.* Reduced subscription rates for joining members are $5 for the Newsletter and $8 for ISLE. To join ASLE, send name, address, phone number, and a check payable to ASLE and indicate which of the publications you want to Michael Branch, Secretary-Treasurer, ASLE, English Department, University of Virginia, Charlottesville, VA 22903.

1st International Symposium on Ecosystem Health and Medicine, New Approaches to Environmental Management

This symposium will be held 19-24 June 1994 in Ottawa, Canada. It will provide an opportunity for professionals working in ecosystem science and management, medical and health sciences, environmental ethics and law, and ecological economics to take part in the development of integrated approaches to the monitoring and rehabilitation of environmental health at the ecosystem and landscape levels. For information and guidelines for papers contact: Remo Petrongolo, Symposium Manager, Office of Continuing Education, 159 Johnston Hall, University of Guelph, Guelph, Ontario, CANADA, N1G 2W1.

Call for Manuscripts

The University of North Texas Press is seeking ecophilosophy manuscripts for its Philosophy and the Environment Series. We seek new, transdisciplinary approaches, and assume a broad acquaintance with environmental studies. The inaugural volume was After Earth Day: Continuing the Conservation Effort edited by Max Oelshlaeger. UNT Press generally follows the Chicago Manual of Style. Write for guidelines. Editor, Philosophy and the Environment Series, UNT Press, POB 13856, Denton, TX 76203.

Forest Protection Lobby Week

Save America's Forests, a nationwide coalition of citizen groups, businesses, and individuals, will be hosting a Forest Protection Lobby Week, Sept. 20-24, 1993 in Washington, DC. All citizens are invited to visit the nation's Capitol to tell their members of Congress to stop the clearcutting on our National Forests and to protect the last virgin and natural forest ecosystems in every region of the country. Participants will gain organizing and lobbying skills, and will help in our effort to pass forest protection legislation and stop destructive timber industry initiatives. For registration information, write, call, or fax Save America's Forests, 4 Library Court, SE, Washington, DC 20003; (202) 544-9219, fax: (202) 544-7462.

Environmental Justice & Racism Conference

The University of Colorado at Boulder will present a conference addressing isues of environmental justice and environmental racism Sept. 28-Oct. 3, 1993. Over the past few years, there has been a shift of focus to include environmental justice and racism within the realm of environmental work. It has become evident that just as the earth is affected by environmental degradation, so are people, and those people are overwhelmingly people of color. The following are among issues to be addressed: Trade issues with an emphasis on NAFTA and GATT, international monetary institutions and 3rd World debt, international waste trade, indigenous land rights, labor and the environment. Invited speakers include Ben Chavis (NAACP), Winona LaDuke (Indigenous Women's Network), and Helena Norberg-Hodge, anthropologist.

For info. contact: The Environmental Center at the University of Colorado, Boulder; (303) 492-8308.

ABOUT SUBMISSIONS

Wild Earth accepts 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. When appropriate, drawings should include common and scientific names.

Articles/letters should be typed or neatly hand-written, double-spaced. Those who use a computer (heaven forbid) **should include** a copy on disk. We use Macintosh but can convert from PCs ("personal [like hell] computers"). Writers who want their material returned should enclose a self-addressed stamped envelope.

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).

Join the Cenozoic Society and subscribe to

Associate Members receive an annual subscription (4 issues) to *Wild Earth* and discounts on back issues, other publications and merchandise.

❒ **New Membership**
❒ **Renewal**

$25 _____ Associate Membership/annual subscription.
$30 _____ Annual institution/group subscription.
$30 _____ Associate Membership/ subscription in Canada or Mexico.
$35 _____ Associate Membership/ subscription overseas. (surface mail)
$40 _____ Associate Membership/ subscription overseas. (air mail)
$15 _____ Associate Membership/ subscription (Low Income)
$ _____ Here's a donation for gift subscriptions. (*Wild Earth* staff may choose recipient/s.)

$ _____ Here's my contribution to the Wild Earth Research Fund.

❒ Send me a sample issue. (Please include $2 for postage.)

Name _____

Street _____

City _____

State _____ Zip _____

No gimmicks.* No gadgets.

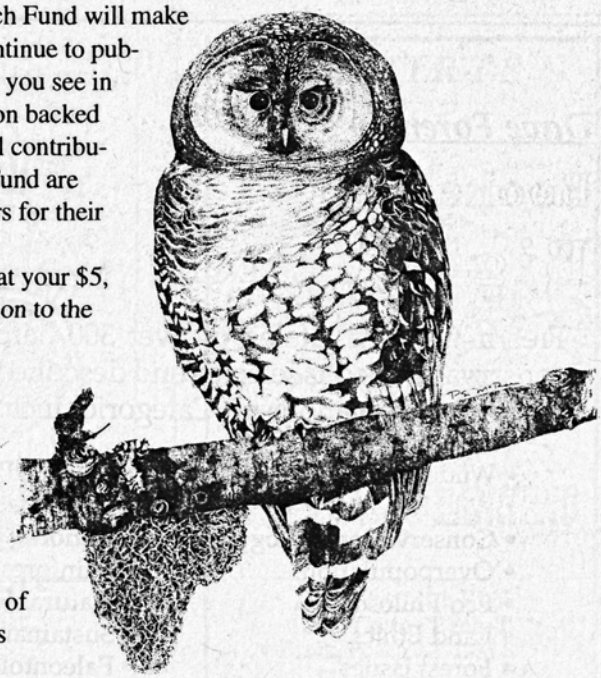
Send us your money.

Yes, we know you're deluged with pleas for money from worthy organizations. If you're like us, you may be waging a constant battle to keep your mailbox free of appeals from the big, Washington, D.C. environmental groups. Well, raising money is a tricky business and we're not very good at it. *Wild Earth* doesn't buy and sell mailing lists, hawk green gadgetry, or print ads from caring corporations like Dow and Exxon. Our focus is simple—*Wild Earth* acts as an independent, biocentric voice within the New Conservation Movement, and publishes the finest, most visionary writing on wildlands/conservation issues. And that takes money.

THE RESEARCH FUND

No periodical like *Wild Earth* survives on subscriptions alone. We depend on contributions from individuals and foundations. Your donation to the Wild Earth Research Fund will make it possible for us to continue to publish the kind of articles you see in *Wild Earth*—bold vision backed with sound science. All contributions to the Research Fund are used to pay contributors for their work.

We don't claim that your $5, $10, or $500 contribution to the Wild Earth Research Fund is going to save the planet. We can guarantee, though, that it will help us continue to be a loud, uncompromising voice championing the cause of biodiversity, wilderness and life!

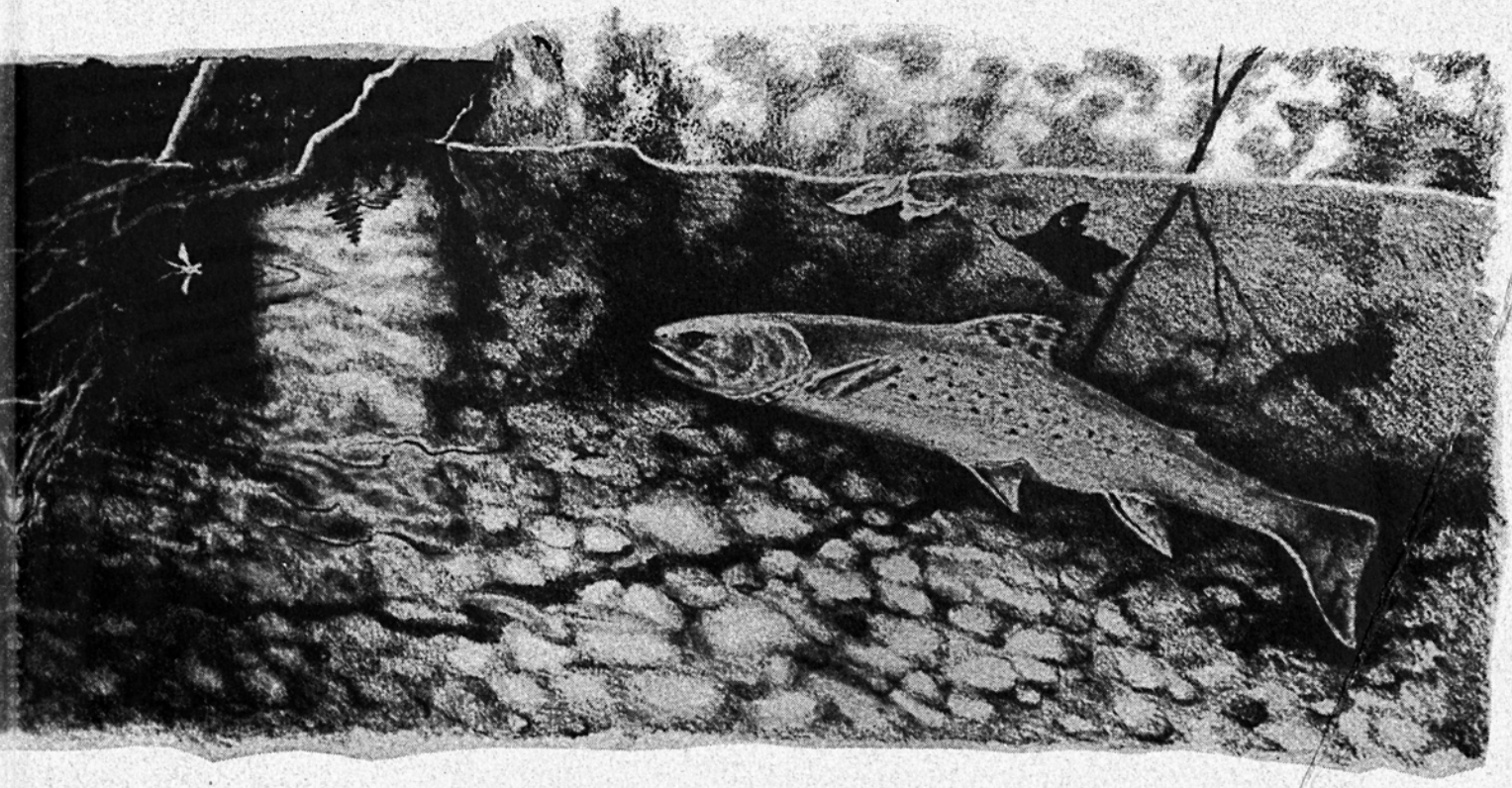


* O.K. Here's our gimmick. For a limited time, all donors sending $75 or more will receive a signed, limited edition print of the Northern Spotted Owl by artist Peggy Sue McRae. This is the same, stunning image that appeared on the cover of *Wild Earth*'s premiere issue.

Send tax-deductible donations to: The Wild Earth Research Fund POB 492, Canton, NY 13617

Brook Trout (*Salvelinus fontinalis*)

A Shiver Runs Through It



Brook Trout (Salvelinus fontinalis) by Bob Ellis (pencil drawing)

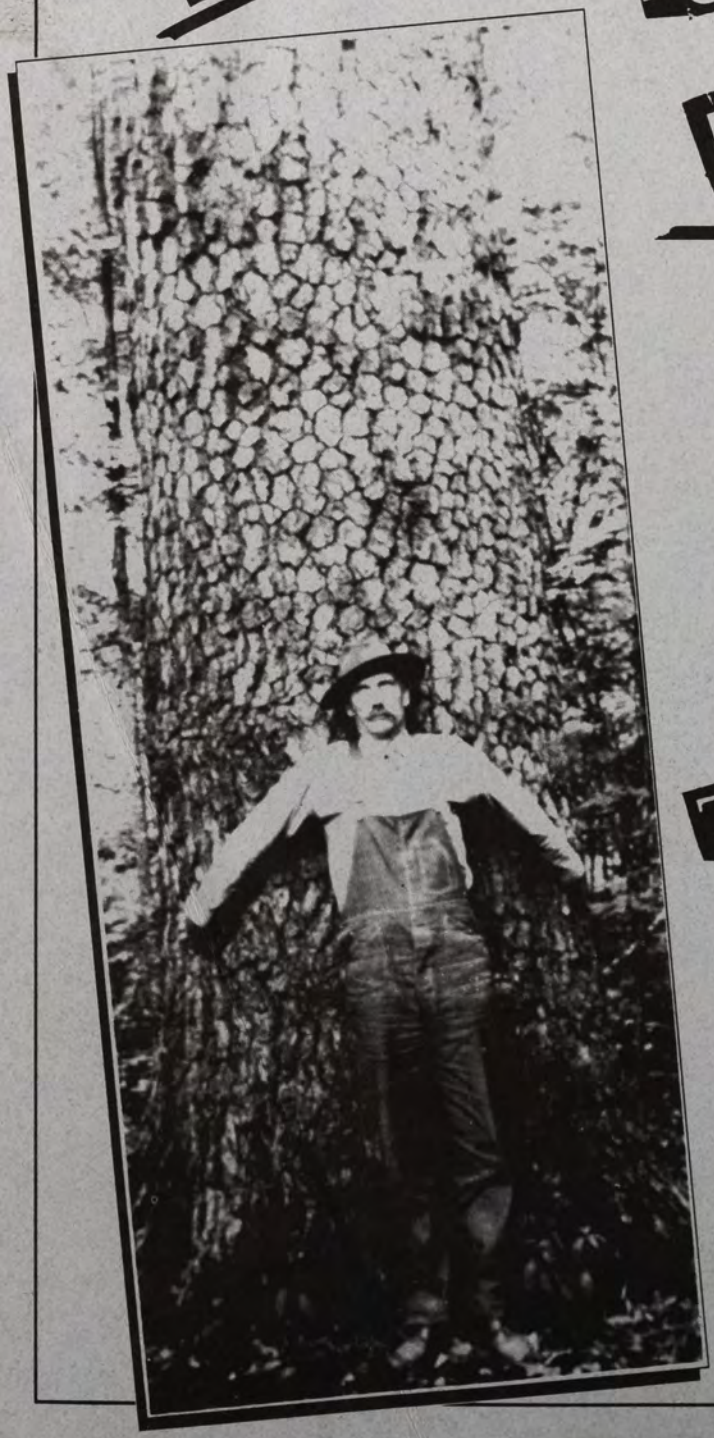
No longer lucky enough to loll and luxuriate in lotic ecosystems—bestirring itself from its mountain pool haunts only to catch the occasional insect, amphibian, or smaller fish—this piscine predator is now imperiled by numerous anthropogenic factors. "Brookies" must fear much more than barbed hooks these days.

The Brook Trout once thrived in fast-running streams and rivers in much of the East, including the southern through the Northern Appalachians. Dams, other forms of habitat destruction, acidic deposition, sedimentation from logging, and introduction of Brown Trout from Europe and hatchery fish ("oatmeal with gills," as one disgruntled fisher recently opined) have eliminated or reduced native trout populations in most Eastern streams in recent decades. Trout bespeak the need for dam dismantlement.

Artist Bob Ellis (P.O. Box 91, Wendell, MA 01379) is a regular contributor to Wild Earth. *Though most of his illustrations appearing in recent issues have been pen/ink drawings, he works in watercolor and pencil as well. Bob currently serves as president of the Bear Mountain Preservation Association (POB 72, Wendell, MA 01379), which is embroiled in a battle to banish ORVs from Massachusetts State Forests.*

Wild EARTH
P.O. Box 455 • Richmond, VT 05477

Act nOw or Your cHiLDreN WiLL neVeR SEe a Forest AGaiN



Join HEARTWOOD, a fast-growing coalition of 40 grassroots groups united to protect the Central Hardwood Forest, from Arkansas to West Virginia.

We are dedicated to stopping logging on public forests, and to organizing broad-based mainstream support for long-term forest protection.

TheRE's Not MuCH TiME!

Send small and large unmarked bills, and other forms of currency to

HEARTWOOD

P.O. Box 402 • Paoli, IN 47454-0402
or call (812) 723-2430 for more information.
Your contributions are tax deductible.

We've got this guy on a T-shirt! 100% cotton, $13 each, S-XL.