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Suggested citation: Butler, Tom, ed., *Wild Earth* 9, no. 1 (Spring 1999).
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WildEARTH



SPRING 1999

Coming Home to the wild


\$4.95 US / \$6.50 Canada



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Wilderness and Spirituality

by Harvey Locke



Deep down, many conservationists are haunted by a nagging sensation that we are not doing enough. We fear that Nature's fabric is unraveling all over the world and that we work in a valiant, but doomed cause. How can it be that the Pacific is in danger of losing some species of wild salmon? How can the Atlantic be almost out of cod? How can it be that the shimmering ice of Bow Glacier in Banff National Park contains industrial pollutants?

We fear we labor in a doomed cause because we do not yet see a change in society's relations with Nature. We humans are now practicing what Stan Rowe described as "species selfishness" on a global scale, appropriating most of Nature's bounty to ourselves.

Conservationists continue to articulate arguments for protecting Nature but are stymied by the response that the economy is more important. Until humanity embraces Nature as something more than an object of greed, we will inflict on this Earth an extinction event equivalent to the death of the dinosaurs.

Many of us, in our hearts, fear this end. Is there another possible end? The Wildlands Project proposes we follow a different path—toward reconnection and health for North American ecosystems. But our vision of connected reserves and rewilding does not alone create the societal conditions that will result in the implementation of that brighter vision. How do we create such conditions? The answer may lie in a return to the roots of the conservation movement and in embracing the spiritual community. We need to restore a sense of the sacred to Creation if we are to save it; this will require reaching beyond the traditional conservation community to people of faith. We must reach out to those who have religious and spiritual impulses and, with them, strive to protect the full diversity of life on Earth.

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About Wild Earth and The Wildlands Project



Wild Earth is a quarterly journal melding conservation biology and wildlands activism. Our efforts to strengthen the conservation movement involve the following:

- We serve as the publishing wing of The Wildlands Project.
- We provide a forum for the many effective but little-known regional wilderness groups and coalitions in North America, and serve as a networking tool for wilderness activists.
- We make the teachings of conservation biology accessible to non-scientists, that activists may employ them in defense of biodiversity.
- We expose threats to habitat and wildlife.
- We facilitate discussion on ways to end and reverse the human population explosion.
- We defend wilderness both as concept and as place.



The Wildlands Project is the organization guiding the design of a continental wilderness recovery strategy. Through advocacy, education, scientific consultation, and cooperation with many regional groups, The Wildlands Project is drafting a blueprint for an interconnected, continental-scale system of protected wildlands linked by habitat corridors.

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

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WILD EARTH (ISSN 1055-1166) is published quarterly by the Cenozoic Society, Inc., POB 455, Richmond, VT 05477. The Cenozoic Society is a nonprofit educational, scientific, and charitable corporation. ■ Cenozoic Society Board: John Davis (CA), Barbara Dean (CA), Dave Foreman (NM), David Johns (OR), Reed Noss (OR). ■ 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. Individual memberships \$25; low income memberships \$15. Subscriptions to Canada and Mexico \$30 per year, overseas subscriptions \$45 (air mail). ■ Periodicals postage paid at Richmond, VT. ■ 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. We strongly discourage submissions of unsolicited manuscripts. We welcome submissions of artwork. Artists who want their work returned should include a stamped, self-addressed envelope. *Wild Earth* assumes no responsibility for unsolicited materials. ■ *Wild Earth* accepts limited advertising that is compatible with its policies and goals. For rates/information contact Lina Miller at (802) 434-4077. ■ Copyright ©1998 by Cenozoic Society, Inc. All rights reserved. No part of this periodical may be reproduced without permission. All artwork is the property of the individual artist and is used by permission. Unauthorized reproduction of artwork is unethical and illegal. ■ Permission to photocopy items for personal use, or the internal or personal use of specific clients, is granted by the Cenozoic Society, Inc., provided that the base fee of \$1 per copy of the article is paid directly to the Copyright Clearance Center, 27 Congress St., Salem, MA 01970; this fee may be waived in some circumstances by the publisher. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is: 1055-1166/92 \$1.00. ■ *Wild Earth* is available on microfilm from University Microfilms, Inc., 300 North Zeeb Rd., Ann Arbor, Michigan 48106-1346. Statistical abstracting by Pierien Press, POB 1808, Ann Arbor, MI 48106. ■ Articles appearing in *Wild Earth* are indexed in *Environment Abstracts*, *Environmental Periodicals Bibliography*, *The Alternative Press Index* and *Wildlife Review Abstracts*. *Wild Earth* is printed on 100% PCW paper (cover and insert) and 50-100% PCW paper (inside), all processed chlorine-free.

Wilderness and Spirituality, continued

Many great thinkers have looked at religion in the context of the present ecological crisis. Some argue that the sky-God traditions of Judaism, Christianity, and Islam have contributed to our environmental problems by detaching humanity from Nature. Doesn't Genesis say "Fill the Earth and subdue it"? Others have pointed out that environmental destruction is quite prevalent in Hindu and Buddhist societies. Some have suggested that the dominant traditions should be rejected to pursue the Earth-centered traditions of indigenous peoples, or that we must create a new consciousness based on deep ecology or biocentrism. Still others are uncomfortable with the very concept of religion.

Instead of focusing on what is wrong with one tradition or another, I think we must look to what these traditions could bring to the overarching goal of protecting the Earth. The conservation movement includes devout Christians, Buddhists, deep ecologists, followers of indigenous traditions, atheists, etc. What we have in common is a deep and abiding concern for the Earth. Whether we call it God's Creation or Napi's work, or whether we see it the other way around—that Nature itself is our Creator—we share a sense that Nature is sacred and worthy of protection.

AS A BOY, I FELT MAGIC IN NATURE. I KNEW THE CANADIAN ROCKIES WERE special to my parents. Places like Mt. Assiniboine and Lake O'Hara, Shadow Lake, and Skoki were spoken of in reverent tones in my house. When my Dad finally took me to Skoki Lodge in the backcountry of Banff National Park, it was a rite of passage that moved me deeply. I was now worthy of a mountain pilgrimage. Yet it was not until I was an adult that I recognized that other people felt the same deep resonance that I did in the presence of natural beauty—whether it be seashore, grassland, or ancient forest.

When, as a young adult, I came upon the writings of Sierra Club founder John Muir, I was stunned to hear him state my feelings so profoundly—especially when I had never been to any place Muir had been. He said "Climb the mountains and get their good tidings," and I knew exactly what he meant.

J.B. Harkin, who established the world's first National Park Service and was Canada's first Commissioner of National Parks, wrote many years before I was born of "wonder, reverence, the feeling that one is nearer the mystery of things—that is what one feels in places of such sublime beauty." He described the "silent wildernesses" as "holy places."

These are remarkable words for a career public servant. Harkin wrote: "People sometimes accuse me of being a mystic about the influences of the mountains. Perhaps I am. I devoutly believe there are emanations from them, intangible but very real, which elevate the mind and purify the spirit."

A.P. Coleman, a Canadian geologist and explorer of western Canada in the 19th century, said that in the mountains "there is a feeling of having caught Nature unawares at her work of creation. Here is dignity, purity, measureless peace. Here one can think high thoughts."

What are these long dead men going on about? Well, they are talking from the heart. They are talking of their spiritual connection to wilderness—a profoundly *religious* feeling. I'll bet not one in ten people in the conservation community is involved



because environmental protection is an intellectually stimulating field. Few conservation biologists are excited by doing minimum population viability calculations—it is the wonder of the studied species and ecological interactions that moves them to do the work. The conservation community exists because we feel a deep and awesome connection to Creation. Because we know in our cores that we would be immeasurably poorer if we could not feel Nature's power and receive it in our hearts and in our pores. And we feel a deep reciprocal duty to try to protect Her.

Those who came before us were not shy to discuss their true feelings about Nature, their spiritual connection to wild places. Yet somehow in the late 20th century, the modern conservation movement joined society as a whole in a retreat into rationalism and devaluation of the sacred. We put our faith in having our cake and eating it too—using as much of Nature as we wanted and setting a little bit aside for wildlife and recreation. We would manage this resource called Nature and would rely on environmental impact statements to safeguard Her. In Canada, we argued for percentage targets for protecting Nature—at least 12% of the country to be saved in parks and wilderness areas as a prerequisite to sustainable development. Then, to our horror, just as conservation biologists discovered that island parks in a fragmented landscape were stepping stones to extinction, we realized that this figure had somehow been turned from a minimum target into a ceiling for the amount of land the nation could spare to protect our rich natural heritage. While we have worked hard, sometimes to the point of exhaustion, we must accept that our efforts to date have not been adequate.

In the 1990s greed has become socially acceptable due to its positive effect on the economy. This glorification of greed

leads to the destruction of both ecosystems and civil society. This selfish arrogance and lack of humility is no less deplored by the religious community than it is by conservationists.

The advanced state of greed reached its highest expression in the United States when a new breed of Republican swept to power in the 1994 congressional elections. Through what they called the “Contract with America,” these Republicans threatened to disestablish National Parks and unravel the Endangered Species Act, the most important piece of environmental legislation on this continent. All the while they asserted a religious basis for their views. Conservationists fought the assault in what appeared to be a losing cause. Then a new group emerged, expressing its values unashamedly. A group of evangelical Christians went to Washington. They simply said to Republican legislators that it was a sin to destroy God's Creation. They invoked Noah's Ark. And they saved the Endangered Species Act. A happy story with a real life *deus ex machina* ending.

As this American example shows, there is a fertile and yet largely unexplored confluence of values between organized religion and advocates for Nature. Virtually every major world religion deplores greed and urges reverence for the sacred, as do indigenous spiritual traditions. *McLeans'* 1997 year-end poll found that 75% of Canadians have an unsatisfied spiritual hunger. The Biodiversity Project's 1996 study of public attitudes showed that 67% of Americans believe that Nature is God's Creation and that we should respect and care for the Earth. But we in the environmental community generally have been shy to speak like Muir and Harkin, or to refer to God's Creation, or to describe Nature as deserving reverence in our efforts to protect biodiversity. We have hidden our values behind rational arguments.

Surely it is time for our movement to reach out with these values to the religious community, First Nations, and others to engage in charting a brighter future for Creation. We must find a common story in which Creation is exalted rather than an object to be exploited for material gain—a new story by which human life can be made more satisfying and meaningful as part of the broader community of life.

Outreach initiatives between conservationists and religious groups are underway across the United States and beginning in Canada. Our challenge is to find the common values that will create an active societal majority who believe in the sacredness of life on Earth. In so doing, we must be cross-denominational, respectful, and alert to avoiding zealotry, and include deep ecologists, atheists, and native peoples. And to be genuine we must do this work with deep awe and respect—for it is no light matter to invoke the sacred. But it is no light matter to work for the survival of Creation and the holy places we know as wilderness.

As we broaden our engagement, we know we will stub our toes. We are certain to have setbacks. But we will remember that we labor in a worthy cause. We can be fortified by the success of the early Christians who were fed to the lions by the Romans—only to persevere until the entire Roman Empire converted to Christianity. We can recall the Jews of the diaspora who, scattered all over the globe and persecuted horribly, said to one another for over a thousand years, “Next year in Jerusalem,” and finally made it there. We can learn from the perseverance of First Nations in Canada and Native Americans in the United States who, despite years of state-imposed repression, are now reestablishing their cultural and religious traditions. We can remember that poll after poll show that a majority of North Americans care about the natural world. And we can draw inspiration from those who went before. Almost 200 years ago William Wordsworth wrote:

*Knowing that Nature never did betray
The heart that loved her; 'tis her privilege
Through all the years of our life, to lead
From joy to joy: for she can so inform
The mind that is within us, so impress
With gladness and beauty, and so feed
With lofty thoughts, that neither evil tongues
Rash judgments, nor the sneers of selfish men,
Nor greetings where no kindness is, nor all
The dreary intercourse of daily life,
Shall ever prevail against us, or disturb
Our cheerful faith that all which we
Behold is full of blessings.*

Let our hearts who love Her not betray Nature. Let us reach out to and embrace all others who believe that Nature is sacred. Let us dream a world full of wild salmon and cod, a world full of cathedrals of old-growth forests, of grasslands carrying the music of the Meadowlark, and of streams of clear, cool water.

Let us dream a world lit by the green fire in a wolf's eyes, where thousands of caribou thunder across the arctic tundra, where the grizzly infuses the landscape with its power, and where the songbird sings forevermore. Let us have the courage to be wild at heart, to keep faith with Nature by joining hands with the spiritual community to work for the protection and restoration of Nature's full glory. It is time for us to say the next millennium is about the love of Creation and to strive to make it so. ☾

Harvey Locke is president of The Wildlands Project and vice president for conservation of the Canadian Parks and Wilderness Society (CPAWS). He lives in Calgary, Alberta and has just retired from the practice of law to devote himself full time to conservation. This article is adapted from a speech he gave at CPAWS' 35th anniversary dinner in Vancouver, BC in November 1998.

Interfaith Delegation Begins Campaign for Forests

The Religious Campaign for Forest Conservation kicked off its first advocacy efforts February 1–3 in Washington, DC, meeting with Interior Secretary Bruce Babbitt, US Forest Service Chief Mike Dombeck, and Wesley Warren of the President's Council on Environmental Quality. A group of 31 Protestants, Jews, Catholics, and Buddhists from around the nation gathered to pray for the protection of forests and to bring spiritual values to the discussion about public forests in the US. The initial goals of the campaign are threefold: 1) an immediate end to all logging of ancient, old-growth forests, 2) an end to all commercial logging on public land, and 3) a redirection of current subsidies to rural communities for ecological restoration of National Forests.

Administration officials expressed gratitude for the visit of the delegation, welcoming the introduction of religious values into the discussion about public land management. Members of the delegation also visited senators and congressional representatives, expressing support for Chief Dombeck's "roadless area initiative" as a small step in the right direction. Delegates also made a brief presentation to the weekly gathering of forest protection activists, where they apologized for the silence of the faith community on forest issues and pledged their efforts to get religious leaders to speak out on the fate of forests.

The campaign's current efforts are focused on encouraging congregations and religious leadership to join the campaign and to advocate for the ecological health of our nation's forests. Visit the campaign's website (creationethics.org) or contact Fred Kruger (707-573-3762; fred@ecostewards.org) for more information.

Thrashed About

In the fall 1998 issue of *Wild Earth*, Tom Butler's "Thrashing About" [A Wilderness View] turned out to be just that with his "wildly" presumptive charge that Paleo-Indians were responsible for the "wave of extinction that swept over the land."

He guesses first that some disease-carrying (pathogenic) Eurasians and their diseased dogs came across the Bering land bridge 10,000 to 12,000 years ago. This presumption is not supported by scientific evidence.

Then he follows that with another guess that these killers of animals committed original sin by causing the extinction of a number of large species. Another theory with no scientific basis.

In the future, as a responsible editor, Mr. Butler would be doing the right thing to identify his guesses for what they are, and to admit that there are strong opposing viewpoints.

BEN SHERMAN

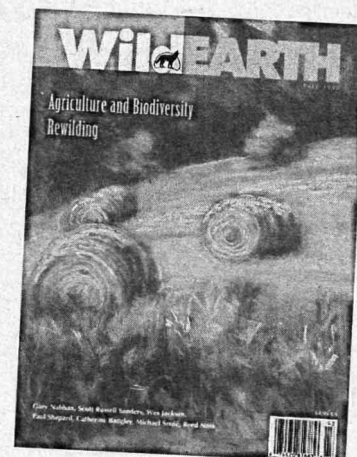
Ben Sherman is president of Buffalo Gap Land Rescue (POB 788, Louisville, CO 80027).

I am writing in response to Tom Butler's editorial "Thrashing About" in which he takes the point of view that the will to control nature is "encoded in the human genome" because it has been a survival trait, and states that "the roots of [human] estrangement [from nature] may be as old as human nature itself." He cites megafaunal extinctions concurrent with human appearances to back this up. I feel that his interpretations of events are narrow, and that the misanthropic views expressed in this article, while

widespread in the New Conservation Movement, conflict with the movement's larger goals. I would argue for a different interpretation that might lead to a more constructive perspective on human nature.

First, any newly introduced species is likely to cause perturbations in the ecosystem—why single humans out as inherently evil for also having this trait? Second, Butler fails to acknowledge that after a brief (in evolutionary terms) period of instability after human arrival on this continent, a new (dynamic) equilibrium appears to have been reached. Like any other species, humans cannot exist without affecting other elements of the ecological community. They can (and have), however, find mutually beneficial ways to interact. In doing this, they *become indigenous*. The widespread use of fire by hunting and gathering cultures probably is the best example of a human management practice that has actually increased biodiversity (Pyne 1995). Australian Aborigines may well have caused extinctions upon their arrival, but since then they have literally *managed* to live sustainably for over 40,000 years (Lewis 1991). Closer to home we find both positive and negative examples to learn from: Anasazi and Mayan ruins illustrate what happens to unsustainable life-ways; cultures surviving at Contact must have been doing something right because *they were still here*.

It is vitally important that the conversations taking place through *WE* acknowledge the fact that humans *can* live in harmony with the land. Our goal should be to encourage the search for



ways to make our own culture "more indigenous" (and therefore more sustainable). Taking this perspective will help people to realize that human management is not always damaging to, and in some cases is necessary for, the preservation of ecological integrity (Anderson 1996).

Keep up the Good Work.

G. ALAN KAUFMANN

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- Pyne, S.J. 1995. *World Fire: The Culture of Fire on Earth*. Seattle: University of Washington Press.

Editor responds: *Space constraints prevent a detailed rebuttal here, but suffice it to say that:*

1) *There is indeed significant, albeit circumstantial, evidence and a growing body of support for the Overkill explanation of megafaunal extinctions in the Americas during the late Pleistocene, when over 50 species of large mammals disappeared (see references for "Bring Back the Elephants!" on p. 64 for reading suggestions on the topic).*

2) *To accept humans as the likely cause of, but dismiss, those extinctions in such an off-hand manner [“after a brief (in evolutionary terms) period of instability after human arrival on this continent, a new (dynamic) equilibrium seems to have been reached”] seems to me to deny our moral culpability and diminish the magnitude of the loss. Would anyone, for example, describe the horror of the Holocaust as “a brief (in historical terms) period of instability in Europe after which a new (dynamic) equilibrium between nations was reached”?*

3) *I am not a misanthrope.* —TB

The fall 1998 issue includes some articles that damn intensive agriculture without consideration of the implications of the alternatives.

The whole point and accomplishment of intensive agriculture is to produce more food per unit of land cultivated. Any reduction in agricultural intensity would require an offsetting increase in the area under cultivation, a problem for biodiversity. Or, alternatively, a reduction in food produced, and therefore a reduction in the human population which could be supported.

Indeed, I have read (in a paper from Negative Population Growth, I believe) that human population has surpassed the level that could be supported by organic agriculture, and that the universal abandonment of chemical fertilizer would require the reduction of the Earth's human population by about one-third. How might the opponents of intensive agriculture propose to accomplish this?

It keeps coming back to population. Is there ultimately any other environmental issue?

BROOKE JENNINGS
Salt Lake City, Utah

I work on preserving and restoring biodiversity, habitat function, and species viability. I have taken fire from many sides and have learned to live with grief and frustration over loss of open space, loss of views, loss of species, and the corruption of what fragments remain by nonindigenous invaders. I didn't know I needed *Wild Earth*—to help me look at what to do, based on what is working in other places. I didn't know that *WE* could offer hope.

What I have found is issue after issue of thought-provoking writing. Not only writing to inflame, as others do. Writing with accuracy and care. Not slick. I do like the paper—it has a nice texture to it, touchable but anti-gloss. I find myself thinking more about how and what to do, and less about what has been lost, not that this isn't important. I enjoy the excursions into history of places, ideas, movements, our use of certain resources. I have come to realize that I value *WE* more than I thought.

More than anything I like the philosophical excursions. Much of my philosophy is wordless, I think, and these excursions help me immensely

with the process of finding appropriate words for writing, for public speaking, for that 15-second sound and visual byte for the latest video reporter stalking hot issues. So while I like reading about what's happening in other places, and about case studies, and about politics and campaigns, it's the philosophy coming through it all that I really enjoy, and learn from, and think about often. Thank you.

KATHLEEN SAYCE
Nahcotta, Washington

ERRATUM *Jamie Sayen's article (“On Wilderness and Cultural Restoration in the Northern Appalachians”) in the winter issue contained an unfortunate typo. The phrase should have read: “a great many of the concerns that render our angry, frightened neighbors vulnerable to industry-sponsored demagogues are shared [not shaped] by wilderness defenders.”*



WILD EARTH WISH LIST
We are in need of relatively recent Macintosh equipment. Please contact us if you can offer hardware, software, or expertise.

POETRY

☞ **Returning**

I would give this life in a heartbeat

To see the tongues of ten thousand bison touch the tall grass plains of Nebraska, sinuous, endless, a profusion of being

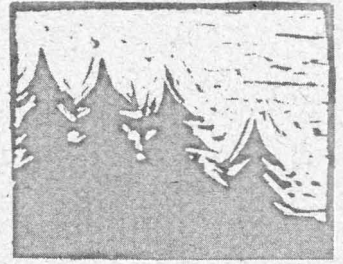
Or the Bay of San Francisco without a city, the heaped shell middens of the Miwok rising along the shores like temples to the moon

Or to have one frail morning in Pennsylvania, with Passenger Pigeons blotting the sun, twelve million wings roaring

With any one of these my speech would return, and the world could begin again

—Glendon Brunk

A Wilderness View



Rewilding Ourselves, Rewilding the Land

Wildness is the patterning power in this lavish production; it is orderly, extravagant, inventive. Wildness coils the molecules of DNA; it spirals the chambered nautilus and the nebulae; it shapes the whorls on a fingertip, the grain in wood, the planes of cleavage in stone; it regulates the waves breaking on a beach and the beating of a heart; it designs the amoeba's flowing form, the zebra's stripes, the dance of the honeybee...

—Scott Russell Sanders

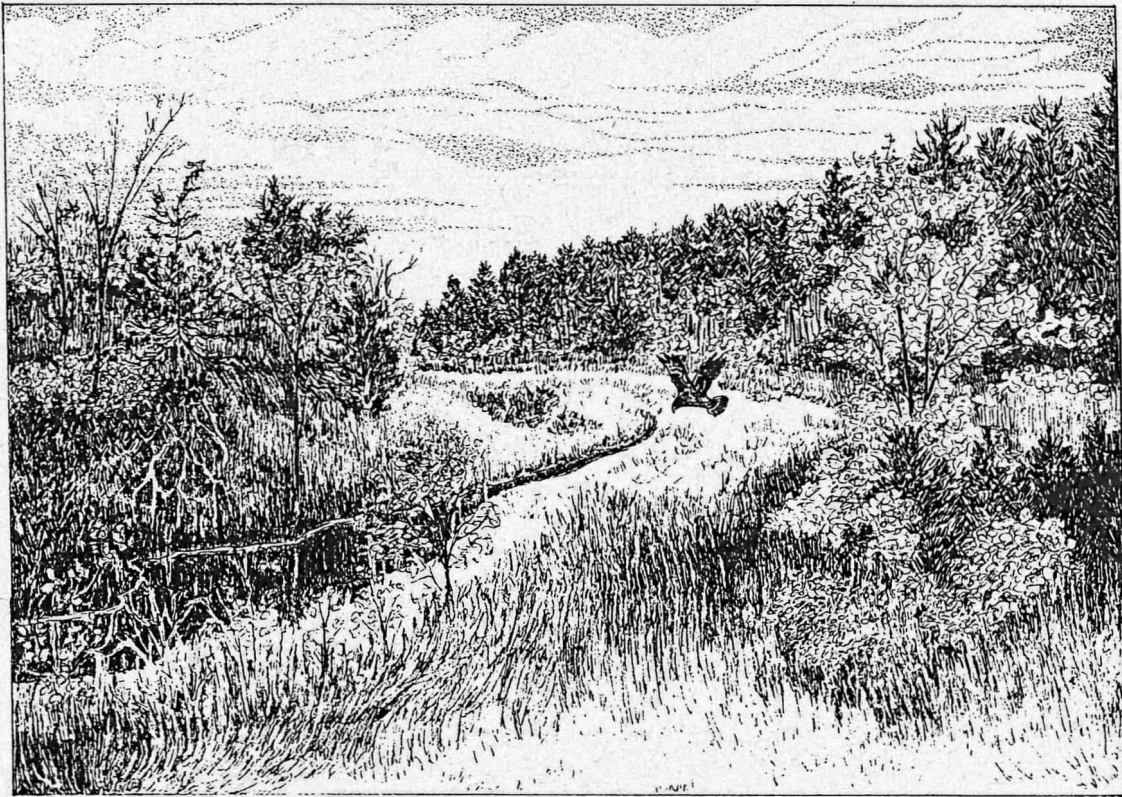
In the woods behind our house are the remnants of an old barn foundation. Stone walls, now largely succumbed to gravity and time, snake upslope past an abandoned orchard overgrown with maple, popple, and ash. Farther up the ridge, an old wood cookstove lies in pieces, unceremoniously dumped there decades ago to rust away at the base of a scraggly apple tree.

That these woods, but recently orchard and pastureland, are covered again in a great green cloak, and that long-absent moose, black bear, and fisher again abide hereabouts, are testament to the healing powers of Nature. Many commentators—most notably Bill McKibben, Jamie Sayen, and John Elder—have celebrated the revival of wildness across the Northern Forest of the northeastern United States, viewing that recovery through the lens of both ecological and cultural possibility. Elder, in his lovely book *Reading the Mountains of Home* (reviewed in this issue), suggests that “The example of Vermont...shows that wilderness can grow as well as erode....” In describing the formal designation of Wilderness on a landscape still showing the scars of historical use, he writes:

The establishment of Bristol Cliffs Wilderness Area...goes far beyond a chastened policy of noninterference or a taboo against humanity. It represents, rather, both our affirmation of recovered wildness and our choice to take an active role in protecting the conditions under which it flourishes. It is a decision to allow a place for wildness within culture, so that culture, in its turn, can benefit from the wildness surrounding it.

That gets to the heart of the matter.

The central task facing American conservationists—and one that will grow ever more formidable due to increasing human population pressure—is to help damaged ecosystems regain health, and to fashion a culture that will allow wildness to flourish. To be sure, there are some imperiled wildlands in the US, as well as intact watersheds in British Columbia and the Yukon (profiled herein) and elsewhere north of the 50th parallel, where a classic wilderness defense posture is necessary. But the bulk of a continental conservation strategy for the next hundred years must focus on allowing ecological and evolutionary processes to reassert themselves across a diminished land—on *rewilding* North America.



Like young woods grown up from fields, the intellectual and philosophical terrain of rewilding is yet a tangled thicket; in this issue of *Wild Earth*, we'll seek to blaze a path through that maze, exploring the resurgence of the real (i.e., wilderness and wildness) from the perspective of the individual, community, culture, and landscape. Particularly provocative are two essays that consider evolutionary arguments for wilderness protection: "Rewilding for Evolution" by Connie Barlow and "Bring Back the Elephants!" by Paul Martin and David Burney. A paleoecologist and leading proponent of the Overkill theory of end-Pleistocene extinctions, Martin exhorts us to imagine a future wild America—avoiding the blinders of the Columbian curtain—and consider restarting New World evolution of Order Proboscidea (a taxa lost from the Americas a brief 13,000 years ago, likely at the hands of man).

Extinction, as the bumper sticker says, is forever. But the notion of reintroducing proxies for our extinct Pleistocene megafauna compels one to think long and hard about the potential breadth of ecological restoration efforts—both in space and time—and about the possibility of atonement for past human action that belittled Creation.

More immediately pressing is to forestall future anthropogenic extinctions and allow threatened wildlife, especially top carnivores, to recover throughout their native ranges. Eminent conservation biologists John Terborgh and Michael Soulé, in a pre-publication excerpt [Why We Need Megareserves: Large-

scale Networks and How to Design Them] from their forthcoming book *Continental Conservation*, assert that much of the scientific and practical understanding of how to protect the living fabric of North America is already in hand. What lies ahead, the real work of saving wild Nature, is more a matter of finding the vision and courage to let the rewilding begin.

Which makes Henry David Thoreau's oft-quoted aphorism "In wildness is the preservation of the world" seem all the more biologically and culturally prescient. Indeed, Thoreau's words are even more apt today than when he spent his days sauntering through the tamed fields and woodlots of 19th century Concord. If, after this century of rapacious despoilment there is hope for rapprochement between humans and Nature—and I believe there is—*rewilding* is the path out of cultural malaise into ecological integrity, and will be the foundation on which to build sustainable human communities in the 21st century.

WITH THIS ISSUE *WE* BIDS FAREWELL TO EXECUTIVE director Monique Miller, who has taken a position with the Center for a New American Dream in Washington, DC. When Monique came north from Washington to join us nearly three years ago, *WE* finances were shaky. Through her hard work and boundless enthusiasm, our circulation, financial position, and influence within the conservation community have been greatly strengthened. Many thanks and best wishes, Monique.

—TOM BUTLER

Wild Words, Wild Lands

by Brock Evans

For twenty years, I have performed a sacred ritual when I speak to an audience of forest activists—especially if they are relatively new to that peculiar form of political combat known to us old-timers as “the forest wars.” “Everyone raise your right hands, now,” I say. “Now slowly repeat after me these words... ‘I will never, ever use the word *harvest* again.’”

Why? Because the conscious dissemination of the innocuous-sounding word “harvest” is one of the most successful public relations gimmicks ever dreamed up by the timber industry. So successfully has it become incorporated into everyday use that even conservationists—who hate the destruction they see happening in our forests—use it just as normally and easily as any timber beast forester. But what’s actually going on out there in the woods isn’t really a “harvest”—is it? Maybe “cutting,” or “logging”—that’s the term we all used before 1968. Too much of the time, it’s plain and simple *mining*, destroying what will never come back the way it was.

“Harvest” was a deliberately conceived term, adopted widely by the timber industry three decades ago after logging interests had suffered a series of defeats in the struggles over creating Redwood National Park and North Cascades National Park, and designating roughly a million acres of new Wilderness in the North Cascades. Top industry strategists mapped out a campaign, declared a counteroffensive against “conservationists” everywhere (we weren’t called environmentalists yet), and repackaged “logging” into “harvesting,” confusing forestry debates ever since.

Another industry-coined phrase still in common use, especially in the Northeast, is “working forest” (as distinguished from the dire fate of forests unlucky enough to have been “locked up” by “preservationists”). Help! Does anyone really believe that a forest not being logged—a wild forest—is just sitting there, doing nothing? Too many of our own people, people who consider themselves forest advocates, carelessly use this disingenuous term, too.

These examples reinforce the idea that we must never forget the importance of words, phrases, verbal images—language. Words are vital tools that can and do transform the debate for us, help us win or lose our battle to protect Earth’s natural diversity.

Environmentalists understand the power of public relations. Our slogan during the Alaska Lands Campaign (1975–80), “Alaska: Our Last Great First Chance,” reinforced our successful legislative drive, which protected 100 million acres, against powerful political opposition. In most of the campaigns I have been involved in lately, there is a conscious search for “the right message.”

But I fear that too often, we let ourselves become paralyzed by the contemporary style of media campaigns, i.e., that we can’t hope to craft a good message unless we hire a communications professional to dream one up for us. And that can’t be done until we’ve had lots of focus groups and even more polling, to “test” the new buzzwords and phrases. Sit back and let the pros fix it for us!



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Polling and focus groups are good techniques, and conservationists should use them. But they aren't necessarily the only—or best—way to find our voice. Indeed, we should begin our search for compelling word-images in the place where they exist already: inside our own hearts. Steve Trombulak's excellent essay "Wild Forests Are Working Forests" (*Wild Earth* fall 1998), which recalled our coinage of the term "ancient forests" as a turning point in the long struggle to protect Northwest forests, reminded me of this truth.

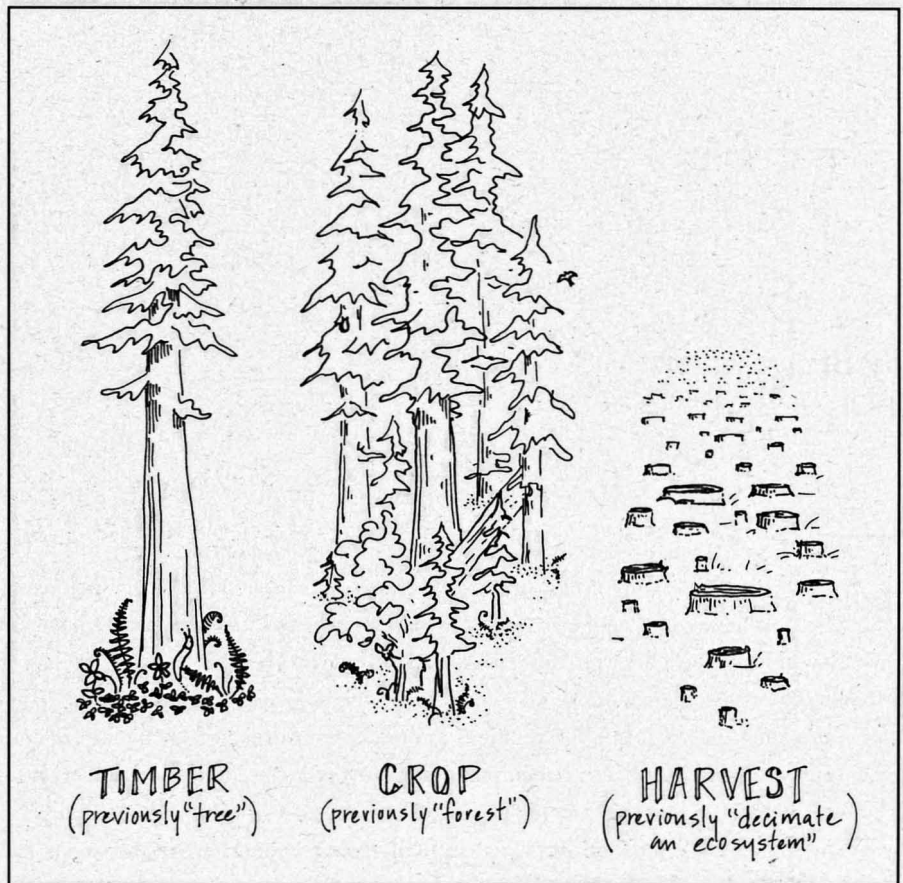
The story of how "ancient forests" became a part of our campaign vocabulary is worth retelling:

We selected those words at a time of great crisis in the battle. It was October 1988, four years after passage of the last round of Wilderness bills in Washington, Oregon, and California. While some wonderful places were protected by these bills, about 90% of the remaining "old-growth" forestlands lay outside them, unprotected and subject to the Forest Service's accelerating logging program.

This was the intent of Big Timber's favorite Senator (Mark Hatfield, R-Oregon) and Congressman (Les Aucoin, D-Oregon). Both held powerful positions on the congressional Appropriations Committees, and they used that power to channel much largesse to their industry clientele. Nearly every lawsuit we won against logging in those years was overturned by an appropriations rider authored by Hatfield (who originated that sinister technique—now the preferred legislative "strategy" of Republicans during the last two Congresses).

So after 1984, the chainsaws snarled and whined even louder across the National Forests; allowable cuts escalated to obscene levels, and every attempt we made to stem the flood was turned back. We thought that what was happening—the destruction of these magnificent public forests, some undisturbed since the time of Sargon the Great (Mesopotamia, 2200 BC), and of individual trees in existence since Charlemagne's time—ought to be a national issue. But we couldn't interest any politicians outside the Northwest. "Leave it to [the tender mercies of] Mark Hatfield," they said.

In desperation, we convened a conference in Portland that September, a high-level gathering of folks I called "proven battle leaders." We didn't need scientists to tell us about the ecosystems, or artists to tell us how pretty it was—we needed



the region's best minds and gutsiest activists to lay out an action plan for how to fight better against such odds. After three days of intense debate, we made three crucial decisions: to treat the entire Northwest forest as a political, as well as biological, unity; to fight for protection of the region collectively, as opposed to each group's individual piece of it; and to wrench the issue out of the domain of regional politics (dominated by Hatfield & Co.), taking it to a better forum—the whole country—in a major national campaign, as we had done for Alaska, Grand Canyon, or the redwoods, in earlier times.

But how to begin? Those were very scary times, and the task seemed immense. The opposition was ferocious, wealthy, and in complete control of all the traditional levers of power (except the courts, thank God). I was obsessed by the idea that we had to find a better name for what we were trying to rescue—one that would resonate with average Americans everywhere. Perhaps a dramatic new term would encapsulate and explain, in one stroke, the beauty and poetry of what was at stake for all of us, and arouse people to action.

Our opponents loved that term "old growth." Vaguely contemptuous, it expressed the forestry establishment's view of all "unmanaged" forests as ugly, something to be got rid of quickly. It well suited the industry's massive PR blitz of the times, which chanted an endless mantra across the Northwest: "Are you going to let a little [spotted] owl take your job because we can't 'harvest' that old growth?" Forest advocates had to find a better mes-

sage, or we could not really hope to break through the Hatfield/industry/labor refrain that this was just a regional issue, to be “worked out locally.”

Our steering committee met in Washington a few weeks later. Coining a new and improved name for “old growth” was a main item of business. We had asked many people for their views, but words like “primeval,” “virgin,” or “untouched” just didn’t seem to grab anyone. At some point, I blurted out, “How about ‘ancient forest?’”

That was it! It had been in the air all the time, half-formed in everyone’s minds and hearts. When it was articulated, everyone seized it. Joyfully, the term became the banner of our cause at that moment, and—as it has turned out—of most other forest battles since then. The Northwest forest wars are certainly not over, but logging in the westside National Forests is down by over 90%, with millions of additional acres across the region mostly off limits—a result we scarcely dared to dream of in those dark days ten years ago.

Those words, “ancient forest,” had a magic and passion to them, and they reverberated loudly across the highly charged political landscape of the times. Some editors of timber country newspapers even forbade their reporters to use the phrase. But the national media, and through them, the American people (our real target) did pick it up. Saving *ancient forests* did become, at last and not too late, a national issue—and that was the way we finally broke the power of the Hatfield/industry/labor axis over them.

A few weeks after we adopted the phrase, I was at a party in Washington. I ran into a friend of mine who worked as a PR person for the timber industry. He practically shouted at me: “Jesus, Evans, where did you come up with that term, ‘ancient forests?’...As soon as we heard that, we knew we were dead!”

Oh yes: language has—can have—a magic and a power to it. It can stir human hearts and rouse people to action—which is vital to a movement like ours, which so often has only the shield of public support to defend the places and the values we love against the destroyers.

It’s all well and good to try to find compelling language by using the tools of our times—focus groups and polling, “message testing.” But, as the ancient forest experience shows, the place to begin that search is much closer. It is right there where the love that drives us on is also to be found—in our hearts. ☾

Veteran wilderness warrior Brock Evans has been fighting to protect ancient forests for three decades. He currently serves as executive director of the Endangered Species Coalition (1101 14th St. NW, Suite 1400, Washington, DC 20005; 202-789-2844; fax 202-682-1331; bevans@defenders.org).

☾ The Forest-Slayers

Have you seen them?

The dreams of which these myths are made.

One has tracks in place of legs,

A mane of smoke, and eyes of glass

Lit from behind by blue gas flames

That take in and reduce all that they cross.

Another bears a cutting chain on either hand,

Listening for the cry of heartwood as it presses in.

There is a third that flies,

Vomiting out a ghosting sweetness

Under which the coughing souls lie down.

But the tallest that the acolytes make idol

Is the image of the Counter with his steely paunch

And open mouth exclaiming sounds

That grow in meaning as they grow in number.

His arguments are simple but insistent,

Heard now from shore to shore above the asphalt,

The silted rivers and the treaded moss,

And the lesser dreams are answers in their litany.

Have you seen how,

Each in his way,

So many men have gone to prove them,

Jaws set in granted anger,

Seeking for the signs upon the trees?

Their cry is *What will not survive*

Must not be left to linger;

Only when the very last has been accounted

Will the myths stand irrefutably

Upon the corpse of love.

—Elye Alexander

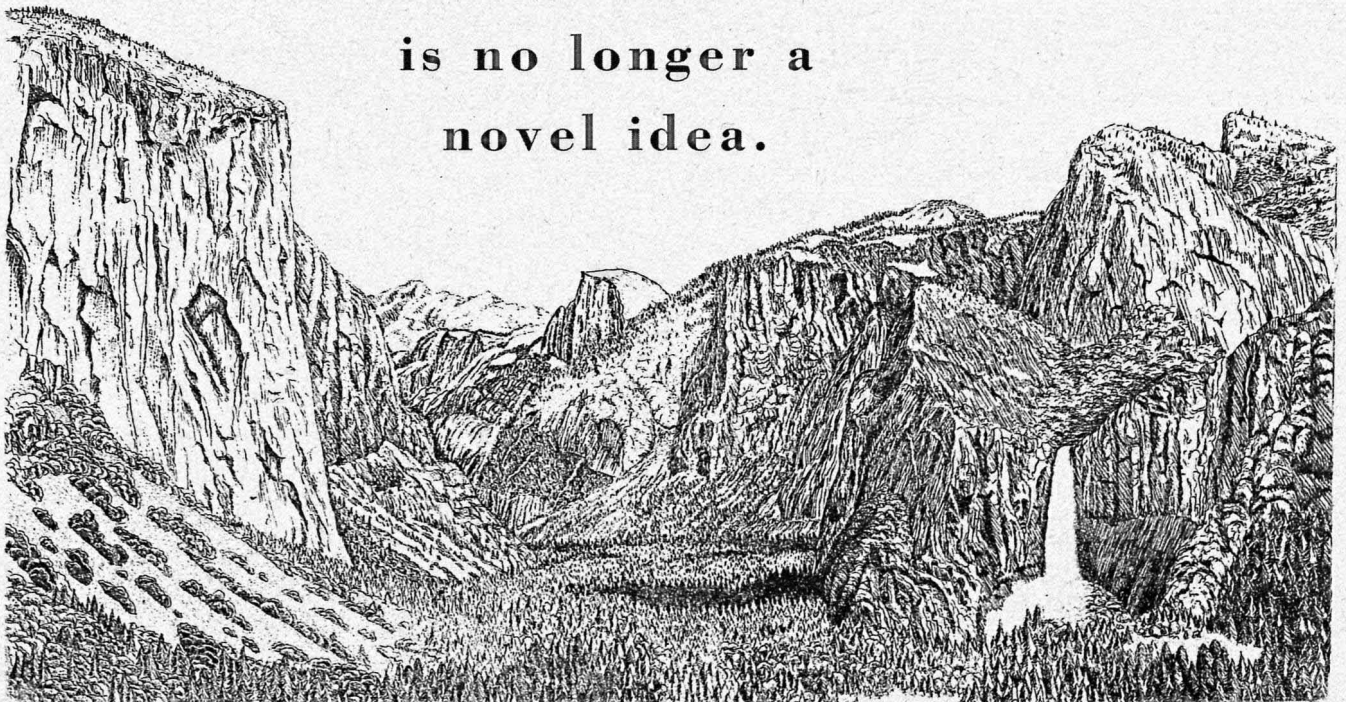
Biocentric Values Go

Mainstream by Sam Hitt

During the last part of the 20th century, the hearts and souls of ordinary citizens have moved slowly but consistently toward a biocentric worldview. Beliefs in the intrinsic rights of Nature, species preservation, and responsibility to future generations are becoming as American as apple pie and motherhood. As this quiet shift in values takes place, we have the rare opportunity to be guided by Jeffersonian optimism instead of what some perceive as Malthusian pessimism.

It is not surprising that the rise of biocentric values has largely gone unnoticed by those who track cultural trends; pundits and pollsters focus on rapidly changing opinions and attitudes, not deeply held values. The slow tectonic shift in the way we view the natural world has been only recently documented by anthropologists and sociologists seeking to chart Americans' attitudes toward Nature.

**Today, the intrinsic
worth of Nature
is no longer a
novel idea.**



One fascinating recent study that probed attitudes toward global climate change came to the surprising conclusion that biocentric values are now widely shared (Kempton et al. 1995). The authors were quick to admonish conservationists for continuing to base their advocacy on outdated utilitarian grounds (e.g., protect forests because they may provide medicines to cure cancer).

Indeed, this call to anchor the conservation message on deeper values has been ignored for most of this decade (Sagoff 1991). It appears that conservationists have fallen prey to a common political dilemma—leaders losing touch with the people they are supposed to lead.

Today, the intrinsic worth of Nature is no longer a novel idea. More than 80% of the public agrees that “other species have as much right to be on this earth as we do” (Kempton et al. 1995). Species preservation is also widely supported: 90% of the persons polled responded affirmatively when asked if “preventing species extinction should be our highest environmental priority” (Kempton et al. 1995).

Even those hurt economically by land-use restrictions often back protection efforts—which shows how deep support for species preservation runs. A majority of laid-off sawmill workers in Oregon agree that “all species have a right to evolve without human interference” (Kempton et al. 1995). More surprising, a substantial minority of the diverse groups surveyed go so far as to prefer that a few humans “suffer or even be killed” than have humans cause extinctions (Kempton et al. 1995).

One of the most widely and strongly held beliefs is the obligation we have to future generations. A full 100% of those interviewed agreed that “we have a moral duty to leave the earth in as good or better shape than we found it” (Kempton et al. 1995). This is about as utilitarian as the new American conservation ethic gets.

Utilitarian, sustainable-use theories actually lose ground in public debates as deeper ecological understanding and emotional attachment to other species develop. In little more than a decade, for example, American attitudes toward hunting nonendangered whales shifted dramatically as we learned more about their complex biology and social behavior. In 1980, three-quarters of Americans said they approved hunting nonendangered whales for commercial purposes; by 1993, only one-third of Americans agreed (Kellert 1996).

Behind this ethical sea change is an increasingly sophisticated understanding of biological principles. Today Americans correctly view Nature as a closed system with limited resources where human changes often have multiple and unpredictable effects. Most people wisely urge caution in manipulating Nature—even when the affected species are economically unimportant.

Another study has documented an emerging demographic subculture powerfully attuned to whole-system thinking and global issues (Ray 1996). This group, whose roots may be traced to 19th century American Transcendentalism, now includes nearly one in four Americans. These persons believe a resacralized relationship to the whole planet is necessary to stem the loss of biodiversity, stabilize the global climate, and protect rainforests. Biocentric values underlay their commitment to ecological sustainability and limits to growth.

Surprisingly, this study also found that over 60% of people are committed to ecological sustainability; only ten percent of Americans describe themselves as strongly pro-growth and opposed to sustainability (Ray 1996). The considerable power the latter view has over our political process stems from campaign contributions, not people power.

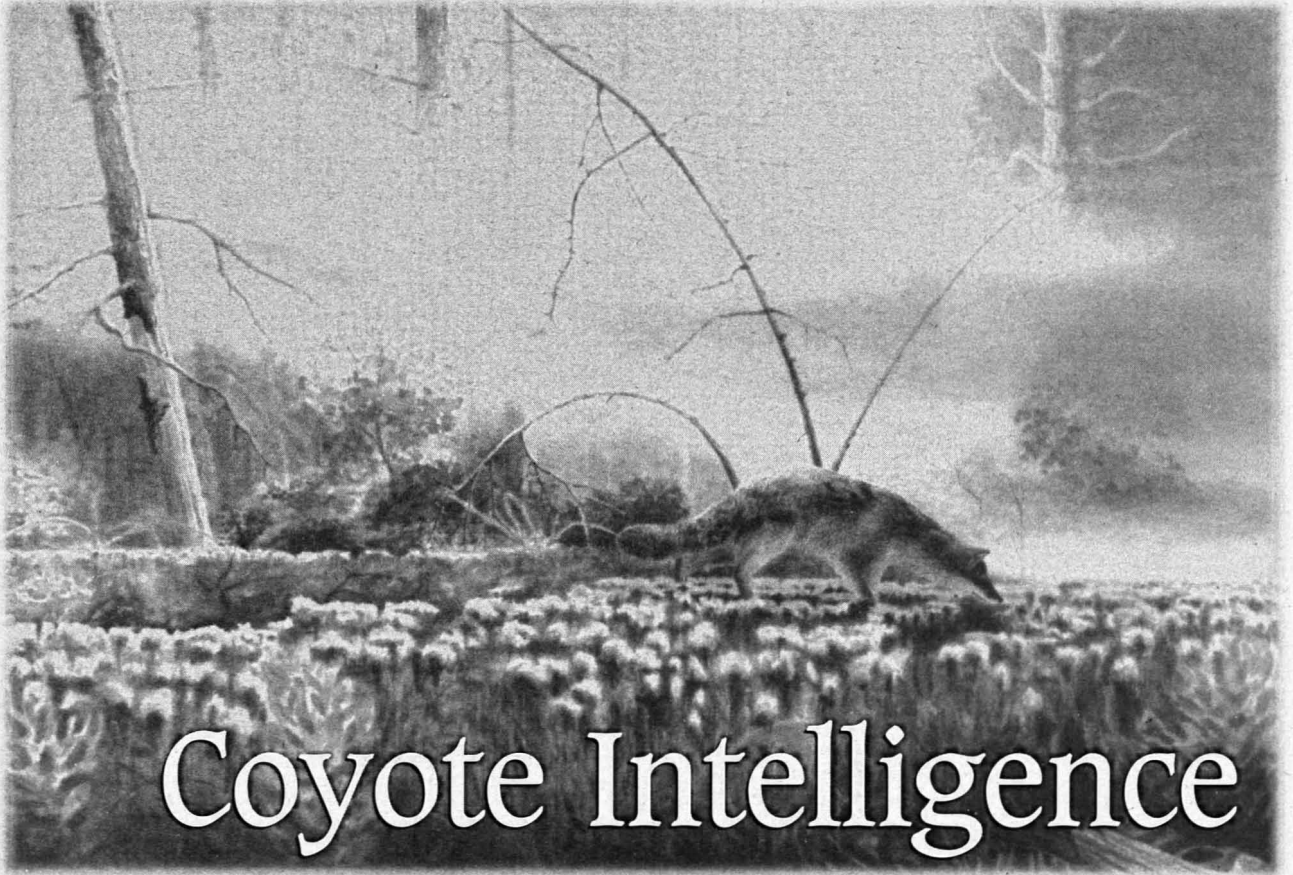
Clearly, a large number of those sympathetic to ecological concerns are retired people, ethnic minorities, union members, and the poor. Many in this group long for simpler times and have difficulty handling the increasing complexity of the modern world. Resentment and fear of change make them ripe for manipulation by religious and political leaders in service of the dominant materialist culture (Ray 1997). It is imperative that conservationists reach out to this group to form strong and lasting political alliances.

As grassroots conservationists, we spend so much time in daily struggles to protect wild Nature that it is often hard to discern the large-scale shift in values now taking place. In the long run, these skirmishes are but small side eddies that listlessly circle off the main channel of history. The challenge of the 21st century will be to stay in the current—and remain hopeful that America’s democratic promise will give rise to a world rooted in biocentric values. ☺

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Coyote Intelligence

Tracking the Wild Within **by Paul Rezendes**

I was walking in Green Mountain National Forest in Vermont, picking my way along a dry streambed. It was late August, a warm, clear day with hardly any wind. Animals have a hard time picking up scent when the air is dry, and my scent was contained by the ravine through which the stream ran. Only my head was visible above the stream banks.

I scanned the forest for wildlife. Movement in my periphery caused me to slowly turn my head. I was startled to see a coyote staring back at me. It soon moved off, and I thought I heard coyote yips, but I wasn't absolutely sure. Then I saw another coyote, moving along the same path as the first. It stopped, seemed to look back in my direction, and continued on.

I became very still. Two other coyotes appeared. They had more rust in their coats than the first two animals. These last two animals approached each other and met behind a tree. I was intensely curious to see what they were up to, but I didn't dare move and give away my presence. In a couple of minutes, the rust-colored coyotes moved out from behind the tree and stopped 150 feet away from me at a deer carcass.

This essay is excerpted from The Wild Within: Adventures in Nature and Animal Teachings with permission of Jeremy P. Tarcher, Inc., a division of Penguin Putnam, Inc. ©1998 by Paul Rezendes.

As the coyotes noshed on the carcass, I raised my binoculars. With the binoculars I could literally stare into their eyes, slanted and colored a striking bright yellow. Those eyes seemed to look past me and through me as if I wasn't there. Yet, for some reason I couldn't fathom, and which raised the hairs on the back of my neck, their attention was drawn in my direction. They would eat, stop, and stare toward me.

I didn't dare move. I felt as though I was going deep into those eyes, deep into coyote, into wildness, a place that has no abode, no face, and harbors no distinctions.

I had been watching these animals for a good five minutes when I began to feel surrounded by coyotes. Dark shapes moved deep in the forest. Now and then I thought I heard yips. The two rust-colored coyotes moved off the deer carcass. Another coyote came to take their place. I realized that I was witnessing a pecking order at the carcass: two older animals had eaten first, followed by two younger animals, perhaps siblings. Then a last coyote, possibly an orbit animal, had taken its turn.

I decided to try to shoot some photos, and ducked down behind the banks of the ravine. You shouldn't be able to sneak up on a coyote, but I thought I'd give it a try. I moved as quietly as I could, keeping trees between us, covering perhaps 25 feet in ten minutes. When I gauged that I was within photo range, I peeked around a tree. I was amazed to see the coyote was still there, and I figured that I'd get only one shot. I was 125 feet from this animal, which, I assumed, would bolt when it heard the camera's shutter click. I took a photo. The coyote's ears perked up. It stared straight at me. Then it dipped its head back to the deer carcass, long snout pecking, salvaging the tiniest scraps. I took more photos, and each time the shutter clicked the coyote looked up. Eventually, it grabbed a bone and dashed off into the forest.

I checked the carcass. The rib cage looked like the skeleton of a wrecked ship: the long chunky twist of the spinal column; the skull in the shape of an iron, oddly flat on top. There was hair everywhere but almost all the meat had been scavenged. Maybe that's why the coyotes didn't stay long. There wasn't much left to eat. I watched the carcass for a while longer, but the coyotes did not reappear. I put my camera away and hiked back down the streambed.

Since that day, when I close my eyes I can see the pupils of the two rust-colored coyotes. There was something secret there, a wildness that didn't only belong to the coyote but that I recognized as my fundamental nature. It was who I was but it didn't belong to me. It was the intelligence of all beings. It was uncultivated, unbiased, and unconditioned. It was true intelligence.

WILDNESS IS NOT SO FAR AWAY. SOMETIMES IT IS MUCH closer than we think. I remember once approaching the frozen shores of Somerset Reservoir in Vermont and glancing out over an expanse of ice. A quarter of a mile away, six coyotes disappeared single-file into the forest. I thought, *How amazing that there are so many coyotes around.* Some biologists think there are more coyotes than foxes in North America. Yet we hardly ever see coyotes, even though their wildness is among us. It is everywhere, but it is hidden and secret. Most of us don't know much about the world of coyotes, but coyotes know a lot about ours. They watch and listen to us.

One winter day I tracked a fisher with eight students. The fisher led us up the north slope of Bemis Hill in western Massachusetts to a small bowl cut into the hillside. It was a hard spot to get to. Below the bowl was a cliff, above it a steep slope, and to either side thick stands of conifers. Inside the bowl were ten coyote beds in the snow, small round circular indentations where the animals had bedded down. Some of the beds were quite close to the cliff's edge. From their vantage in the bowl, the coyotes had a good view of the Millers River and the railroad tracks below. The hillside was cupped like an amphitheater. Every sound that came up the slope was amplified. The coyotes couldn't have picked a more strategic position. The location was unapproachable without their notice. I stood in the bowl, astounded that I could see and hear every sound down in the valley where I live. The coyotes must have been aware of my every movement. Although we are often unaware of wildness, wildness is aware of us. It is everywhere.

Through tracking we can find coyote fortresses, learn the language of the forest, and become intimate with an animal's life. But how do we come to know our own true nature? How do we find the metaphoric coyotes inside us, which are watching and listening to us but of which we are mostly unaware? How do we live the wild within?

One of the ways I suggest is to practice tracking the self. But this practice can sometimes become a trap. It can work against the awareness that is the wild within. I can't tell you what your own path will be. I can only show mine in hopes that it will help you discover your own entrapments. My practice, my journey inward, was fraught with entanglements, distractions, and wanderings, which, in the end, were valuable lessons. ☾

Paul Rezendes is a photographer, tracker, teacher, and writer. His books include Tracking and the Art of Seeing and (with Paulette Roy) Wetlands: The Web of Life. This excerpt is adapted from his new book, The Wild Within: Adventures in Nature and Animal Teachings (Tarcher/Putnam, 1998).

Grizzly Fears

by Glendon Brunk

It has been close to 30 years now since I had my first serious encounter with a grizzly. I was just a kid, in my early twenties, crazy for the wild and adventure, staying in an old cabin 30 miles southeast of Fairbanks on the Tanana River, building my own log cabin just downstream. Late August like it was, the nights were starting to get dark for a few hours, a contrast to the round-the-clock sunlight of full summer. The head of my bed was about three feet from the cabin's only door, a rickety wooden slat affair that admitted huge drafts of frigid air in the winter. I'd been asleep only an hour or so when I awoke suddenly to my dog barking, the unmistakable, gut-bending whoof of a husky badly scared. I lay quietly then, eyes wide, staring up into the blackness. The dog yelped once and ran behind the cabin. I sat up. Suddenly something big hit the cabin door, rattling it like a sheet of craft paper. Then came a low, insistent growl, a terrifying sound with enough big-creature in it to send adrenaline pummeling through my veins.

That was back in my dedicated hook n' bullet days when I never went anywhere without some kind of a gun. I shucked my arms out of my sleeping bag and grabbed the 30.06 leaning up against the wall by the head of my bed. I pushed the safety off and jacked the bolt. With a sinking feeling I felt the bolt miss the shell. (Over the summer months the clip spring had weakened enough so that it would not push the top shell up high enough for the bolt to receive it.)

I felt helpless, terrified. I scrambled out of bed, then stumbled around in the dark with my useless rifle pointed at the door, hollering "Get the hell out of here!" Finally, after a couple more swats at the door, the creature left and made the sad mistake of going upriver to my neighbor Denis's place. Denis, a huge man from Minnesota, known locally (never to his face, of course) as Grizzly Den, was a fellow who would kill just about anything he could get his sights on, damn the seasons, the species, or any ethics that might be involved. The animal entered Denis's compound and tried to crawl into the corral with his skidding horse. Denis's sled dogs, all 30 of them, began baying. Denis leaped out of bed, naked as a tortellini, and from his front porch shot at a hazy black silhouette.



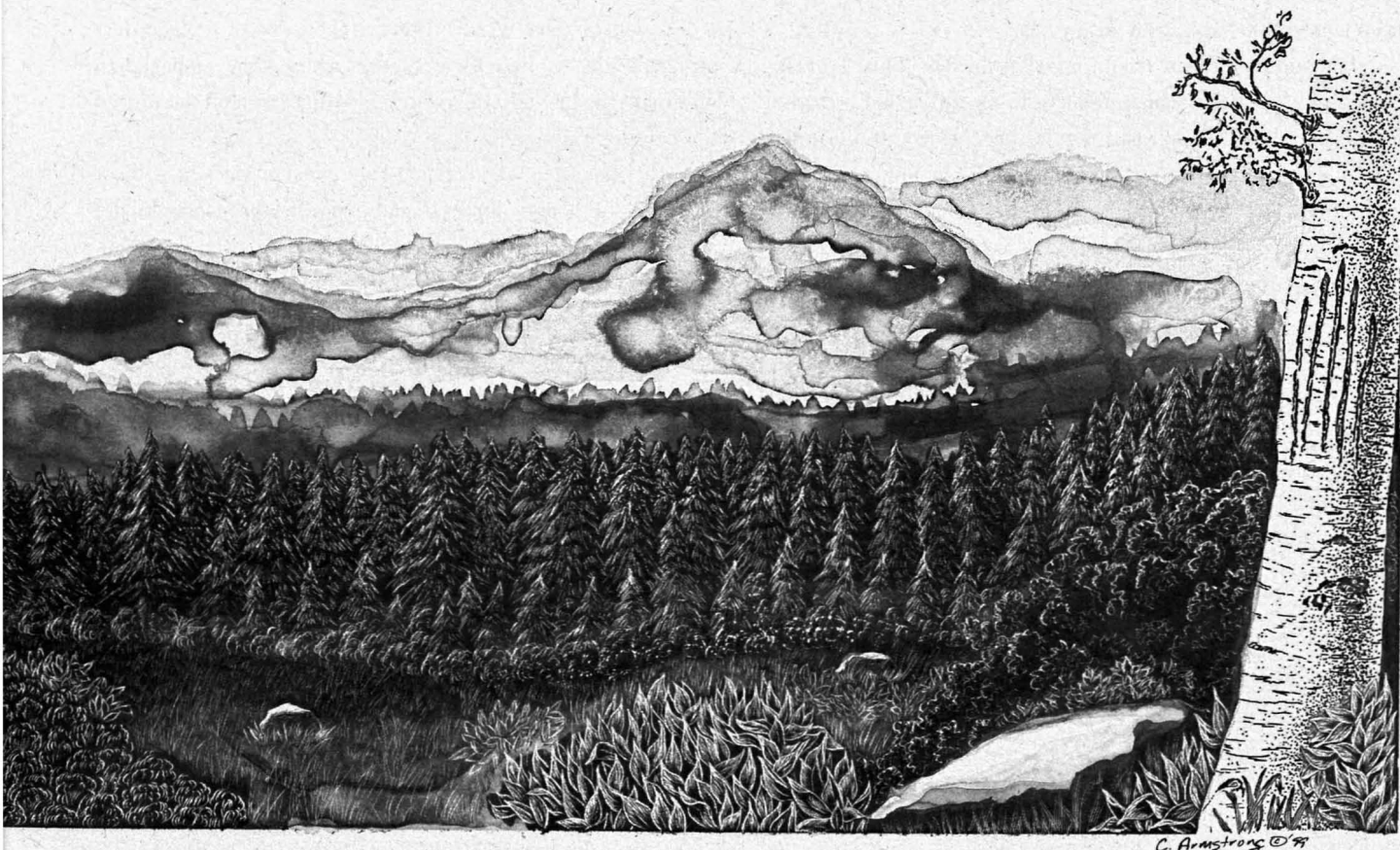
The next part of the story is a testimony to the youthful impetuosity and testosterone overload that most of us young male Tanana dwellers were victims of then. Denis and his (reluctant) wife came down and got me, and off we went through the moonless night, stumbling along by the pale light of a hissing Coleman lantern, following the dull rust spatters of a blood trail, accompanied here and there by the unmistakable prints of a large bear. We followed the trail a hundred yards up along the river bank before it cut into the woods. We'd made about fifty slow yards in the woods when the world suddenly erupted. Brush rattled and snapped beyond the reach of the lantern light. Agonized, angry roars beat against the trees like the devil's own voice. We held our rifles ready for the charge, for a snarling fury to erupt from the darkness. But none came. And then as suddenly as it had begun it ended. The woods around us were completely silent.

We were at least smart enough to give up the pursuit at that point. We went back to our respective cabins. The next morning Denis and I got up at first light and picked up the trail again. When we approached the spot where we'd heard the roaring, the ground all around was gouged and ripped, small trees were scarred and broken like grass stems. At the base of a big spruce we found him, an old boar grizzly, shot hard, up

high and behind the lungs, stretched full out on his stomach, his head twisted grotesquely off to his right and up under his leg. Blood froth rimmed his mouth. His canines were broken and dangling from their roots. That bear had given up life in great agony. I remember thinking that the way his head was twisted up under his leg like that, it looked like he had been ashamed to die the way he had.

He was a big bear, record book, but old and thin, missing back teeth; there was no way he would have made the winter. The outside toes on his right front foot were gone, most likely lost to a trap at some early point in his life. Those missing toes were the clear signature of a bear that had raided cabins up along the Salcha River for years. Glad as I was that he hadn't come into the cabin with me, I remember feeling sad, and wishing he could have had a better, more dignified death.

I try now to recall how I felt standing there in the dark woods with that bear roaring his death throes. It's strange, but I don't recall any fear. I felt fear in the cabin, I guess because I felt so helpless. But in the woods, all I can remember is a calmness, a feeling of being exactly where I wanted to be. Mixed with it, too, was a sense of exhilaration. This same mix of feelings I've experienced other times, always when I've been in the most danger. There may be some grand psychological explanation for it.



If I had to label it, though, I would call it a swift, exacting moment when one's life finally comes to some essential connection, some place where the dread of one's own mortality is temporarily exorcised. Our ancestors, in less predictable and insulated-from-Nature times, must have often visited this place. I would guess, for the most part, their lives were a great deal richer for it.



I STARTED THINKING SERIOUSLY ABOUT FEAR AND grizzly bears not long ago when I was attempting to see as much of the Bob Marshall Wilderness as I could. "The Bob," as they call it in western Montana, is a pretty piece of country, about as wild, I suppose, as it gets in the Lower 48. When people asked me what I was up to and I told them I was exploring The Bob, I couldn't help but note how routinely predictable their responses were: "There's grizzlies in there, you know," or "You're going in there with all those bears?" These were mostly reasonable people, too, wilderness travelers some of them. But their first reaction, consistently, returned to the fact that the place might harbor killer bears. The notion seems to cling like an unwanted house guest, that grizzly bears inhabit every possible nook and cranny of the Montana (and Alaska) wildernesses, and if you don't watch out real careful you're going to end up dead, looking like you've been tackled by...well, by a grizzly bear.

For sure, there are some grizzlies in The Bob. I must emphasize "some," because relative to most places I've traveled in Alaska, The Bob is a regular bear desert. In close to 200 miles of walking trails, as well as a fair amount of off-trail wandering, I've seen only a couple of definite grizzly signs, and not one in the flesh. Yet, I have been assured by Chris Servheen, former head of the federal Grizzly Bear Recovery Program, that an estimated 400 grizzlies reside in the whole ecosystem, which includes Glacier Park. But they're not in the Bob Marshall Wilderness in elbow-scraping numbers, certainly not bountiful enough that you need to carry heavy artillery or spruce up your will before you leave town. From what I know about bears I'd say that in The Bob they're living in some pretty confined and remote pockets, and that they'd much prefer we human types just leave them alone. So people's fear of them is for the most part unfounded.

Not that the fear is all bad. As I told one friend when she asked me whether I was afraid of bears: "Sure I'm afraid of bears. But I'm sure glad they're out there, because it keeps a lot of people out of places they'd be in otherwise." I didn't add that in my mind, fear is one essential, integral, unmitigated part of the true wilderness experience.

I think it was Doug Peacock, the grizzly guru of the West, who said, "It's not really wilderness unless there are things out there big enough to eat you." Peacock was alluding to the idea that a little reasonable, solidly grounded fear is what makes life worth living: Zest, it's called. You want safe and predictable Nature, go hang out at the San Diego Zoo or Disney World. Buy stock in some newly formed virtual reality company. Try golf. Leave the few, hard-pressed, and harassed grizzlies left in North America alone.

Of course, fear is a relative thing. Like most things we think about, the thinking is usually a lot more scary than the actual fact. For certain, our irrational fears keep a lot of us from doing some pretty wonderful things. Our fear of bears (or anything else, for that matter) leads most of us to all kinds of stop-short-of-enjoying-life-fully decisions—like an acquaintance of mine in California who was reluctant to visit Montana because he'd heard a grizzly had walked through the streets of "some town out there." The fact that the town was Gardiner, a tiny burg up on the very northern boundary of Yellowstone Park, had nothing to do with it. In his mind there were bears, dozens of them, battling over the turf in downtown Missoula and Great Falls. I have to mention again that he was from California, where some real serious turf wars are going on in the streets he inhabits. (And I'll ignore the irony of a place they still call the "Golden Bear State," where they managed to eliminate the last villain grizzly somewhere around the turn of the century.)

There are a lot of emotional knee-jerks around the subject of bears—all bears—but especially grizzlies. For example, the author of a letter to the editor published last year in Missoula's daily paper expressed outright disgust because the Fish and Wildlife Service was considering reintroducing bears into the Bitterroot Wilderness of Idaho. He related that his nephew was elk hunting in Wyoming, just "walking up a trail, and was attacked by a grizzly. He went into the fetal position and tried to act dead. His gun was nearby, but every time he reached for it, the bear hit him again."

Now in my mind that sounds like a pretty smart bear, battling a guy for reaching for a gun. Not that I want to demean the terror the young man must have felt, or the pain that he no doubt endured from lacerations that took over 200 stitches to close. The most important point, though, runs deeper than the subject of one person having a nightmare experience with a bear. It relates to something else the letter writer had to say: "It would be a crying shame and, yes, stupid to lock people out of these beautiful areas because of fear..."

There it is again, the old "f" word. If the Fish and Wildlife Service put bears back in the Bitterroot, some people automatically assume that it becomes off-limits for most of the population. I understand the reasoning, but to me it seems out of place relative to some of the things we daily accept in this society. I'm wondering how many roads the guy stays off of because somebody once died in a car accident? Or how many lakes he won't swim in because somebody drowned there? I once heard an Alaska Fish and Game official say that more people are killed by man's best friend in any given year in Alaska than are ever killed by bears.

The point is, most of our fears run irrational. We fear grizzly bears more than some things that truly deserve a good dose of horror, like our own society's corruption and violence. But I suppose, given our modern relationship with Nature, it's understandable. Grizzly bears are one of the few wild elements left, in a society determined to create predictability and homogeneity and that very rarely delivers us Nature at its most horrible, unpredictable, uncaring, demeaning, and nondiscriminating best. Grizzlies are a reminder of the dark side of things, of momma Nature beating on the door, shoving the real goods right in our face. What with all our technological marvels, all our wise notions of dominance and security, the message still comes through: you slip up just a little bit, buddy, and you're hosed.

I've had a couple dozen encounters with grizzly bears since that first one on the Tanana River. I must hasten to add, that even though I've killed several black bears for their meat, I've never killed a grizzly. The best I can figure is some instinct kept me from doing it. Maybe somewhere in my youthful subconscious I knew a truth about myself, and I saved myself from killing an animal I was sure to have deep regrets about when I finally made the decision to quit hunting altogether. Yes, I quit hunting. There are no complicated philosophical explanations for it. All I can say is that the sorrow of killing simply began to outweigh the pleasure of the hunt. I say this, and at the same time I must admit that the old killer instinct is never far below the surface; it can rise easily and entirely when the circumstances are right.

I THINK THAT IT'S IMPORTANT FOR US TO fear bears. We live in a world of natural disasters—tornadoes, for example. But nobody ever cautions me about going back to my boyhood home in Indiana because they have tornadoes there. And I've personally known several people killed by tornadoes. In contrast, I've never personally known anyone killed by a bear, even though I've lived a whole lot longer in bear

country. Twenty-five million people live in California, with an iron-clad guarantee of multiple earthquakes, and more people are moving there every day. Yet you talk to Californians, most are totally nonchalant about earthquakes.

The difference with bears is that they just seem a lot more personal, not abstract and distant like weather or plate tectonics. A bear is a living thing, furry and fast, with teeth and beady little eyes and long toenails, a creature clearly not feeling all warm and fuzzy about the presence of human beings. Our response over the centuries has been to eliminate things that we perceive as a threat to us. We've figured for a long time that if we can just snuff out enough Nature we can make the world safe for civilization. Today, of course, it's old news that if we choose to, we can exterminate a whole species. Gone. Done. Kaput. We win.

But not really. Perhaps—a highly cautious and qualified "perhaps"—a slight majority of people are beginning to realize that "civilization" is not about getting the world safely sterile. A few years ago the Idaho Fish and Game Department commissioned a poll regarding the reintroduction of grizzlies in the Bitterroot Mountains on the border of Idaho and Montana. In response to the poll there were some lame comments, like: "They'll do away with game, and the hunters do a good enough job of that already," or "It's not practical," or "Unnecessary when they're in Alaska." And another that did a masterful job of reordering history with a Zen flare: "Since they're not there now then it's not meant to be."

The good side of the poll, though, seems to present a hopeful paradox. Even though the vast majority of people fear grizzly bears, most would still like to see them back in wild areas. Seventy-seven percent of the national respondents were in favor, 73% in the region in favor, and 62% locally. Of those who disapproved, in all cases over half did so because of safety concerns.

It's noteworthy that the farther away from the Bitterroot the people lived, the more they were in favor of reintroduction; no doubt this says something about the reality of bears actually being in your backyard. But the fact that over 60% of local residents supported it says a whole lot about changes underway in the wild West. One of the respondents summed it up quite simply: "The bears belong in the mountains."

JULY 17, 1987, THE BROOKS RANGE IN ALASKA'S Arctic National Wildlife Refuge, my most favorite place on Earth. Tom Ballantyne, my wilderness partner of many seasons, and I have been out for over three weeks now. In that time we've seen plenty of grizzly sign. On one occasion we surprised a young boar grazing contentedly



We modern humans choose to fear the bear within us.



among a small herd of caribou on a tundra hillside. Two days earlier we saw a bear move high above us on a mountain ridge, then disappear into low clouds. We know we are overdue to see more.

Today we follow a westward compass bearing, hoping to gain a pass that will take us back to the broad gravel wash of the Canning River (the western boundary of the Refuge) 30 miles away, where eight days earlier we cached our raft and the bulk of our gear. Today we use the compass because we move through a surrealistic, drizzling, white-on-gray cloak of fog, a separation from anything familiar. As we move, odd forms emerge like ghosts to metamorphose into rocks or hillsides. We move slowly, attentively, concerned that one of those forms might indeed become a living bear.

Eventually we gain the pass. But on top we can't figure where to turn; the country appears to fall away too steeply on all sides to trust a descent in the fog. We talk it over and decide our only choice is to camp and wait.

Early the next morning the fog clears enough to resume our journey. We climb down into a beautiful green Shangri-La of a valley. At noon we stop and eat lunch in the steep-walled canyon of the creek we've been following. We are about done with lunch when we spot a big grizzly standing on the canyon rim just across from us. The bear is no more than a hundred yards away, yet clearly doesn't see us. We watch it poke around in a little ravine that runs down the canyon wall. Tom and I whisper to each other, trying to decide whether or not we should announce ourselves. Suddenly our presence becomes a moot point. The bear turns quickly and begins to climb the mountain, throwing worried glances downstream over its shoulder. We watch it climb high above us until it comes to a heavy talus slope. There, like a tired dog, it turns round and round several times before it finally beds down in the rocks.

We can't figure what spooked that bear. But when we climb out of the canyon the source quickly becomes evident. A quarter mile away another grizzly chases two caribou downslope and across the creek, then up through a steep break in the canyon wall on the far side. The caribou easily outdistance the bear, a fact that obviously perturbs the bear badly. As it climbs the far slope it swings its head back and forth in an exaggerated, irritated way. Everything in its body language indicates an animal that has had enough of losing.

We know we have to get upwind from it; we want it to get our scent if it spots us, not to mistake us for more caribou. So we start moving cautiously along the opposite side of the valley, doing our best not to attract the bear's attention. We are doing fine it seems. But just as we get directly opposite the bear, it swings its head up and looks hard at us. In the next instant it breaks for us, coming way too fast, in that rolling, flowing, ground-eating gait only a grizzly possesses.

We know we have to gain some high ground fast, to do our best to get ourselves between the wind and the bear. But a couple of middle-aged guys running across rough tundra with heavy packs is no ballet performance. We stumble and trip across the hillside. A steep-sided ravine drops sharply ahead of us. We plunge over the edge, pant and claw our way up the other side, concerned that the bear might catch us down in there where there is damn little maneuvering room.

When we make the top there is no sign of the bear. We keep moving and make the rise. There we quickly turn in the direction we expect it to show, dropping our packs in the same motion.

The wind is at our backs now. Tom pulls out his camera and gets ready to photograph the charge. I crank a slug into the chamber of the shotgun I carry. At that instant the bear appears over the edge of the canyon, coming for us at a dead run.

It takes a lot longer to tell it than it actually took. Tom's motor drive begins whirring. I pull the shotgun up and hold it on the bear's chest. As it closes on us we both holler. Just as I'm ready to pull the trigger, the bear computes the situation—smell, sound, sight—and suddenly, frantically, veers off and away from us. It is astounding how immediately its whole demeanor changes, how quickly it goes from bold aggression to absolute panic. The bear heads uphill away from us, sprints up a 45 degree slope, an incline that would have me wind-broke in a few seconds. In the next moment it disappears over the top of the ridge.

We live in terror of those wild, untamed, restless places within and without.

As it is with any close call with a bear, a grand mix of emotions—joy, terror, relief—boils through one like a storm. That particular bear, though, left me with something else. I remember it very distinctly. Seeing his bold male (my assumption) swagger turn to witless panic, Tom and I beheld how a human presence can so easily elicit terror in the most awesome of creatures. Witnessing his fear I felt embarrassed and deeply sad, embarrassed for the bear and embarrassed for my own species, sad for the legacy we modern humans have sown among wild creatures. We have done so much to alienate the world we live in.

It took that close call, though, for me to have an epiphany of sorts. It took cranking a slug into the chamber of my shotgun, readying myself to shoot, before I finally came face to face with the kind of “non-hunter” I was. There I was owned by my own fear. There I was still depending on a firearm for protection. I was struck by the hard irony of it: for me to be in this wilderness place I loved, I was prepared to kill one of the creatures that absolutely defined its wildness. I had to ask myself that day, was the experience of being there really worth that kind of sacrifice?

IT SEEMS TO ME THERE ARE TWO TYPES OF FEAR: legitimate fear and projected fear. Legitimate fear, like the fear I felt when the bear tried to get in the cabin with me, is real: there is a clearly definable threat to some aspect of one's life, either carried from past experience or felt in the present moment. Projected fear, on the other hand, is fear of the future, a fantasy of what *might* go wrong. Projected fear is the cause of so much bigotry, intolerance, violence, and suffering in the world. Humans may be the only species on the planet with the capacity to project fear: to imagine what might go wrong, and then to create elaborate defense mechanisms—be they psychological or mechanical—to prepare for the possibility.

There's so much irony in it all. I won't say I begin to understand the intricacies of the position we humans have forcefully taken on this planet. But I will say that it seems in wanting to have it our own way, in seeking what's missing in our overly civilized spirits, we so often tend to project fear on those attributes of Nature that would seem to sustain us most, the very qualities that would lead us home to the missing parts, the wild, unscrubbed, unruly, arrogant, and at the same time, soft nature that is ultimately us.

We modern humans choose to fear the bear within us. We live in terror of those wild, untamed, restless places within and

without. They wake us at night and keep us running scared during the day. Most of us don't seem to understand how our fears control us. Instead, we push against them until our souls bleed. We run scared to the shopping centers and movie houses, drown ourselves in a hundred addictions, all under the misperceived notion that such activities will somehow provide solace. There's more sad irony to it all: the more we run from our fears, the farther away from our essential, longing selves we're taken.

I don't mean to infer that an experience with wilderness and bears is the only route home. But I will say that the combination is certainly one of the shortest paths I know of. Like that trip Tom and I took up in the Arctic. The bears were there for us and we knew they were there, so there was no more running from the shadow. We were incapable of escaping our deepest cravings and fears, and in the process we could begin to discover that we truly were alive. We were alive because we were forced to come face to face with our own mortality. And if I'm to understand anything about human psychology, it's that peace can begin to enter one's life when one accepts the inevitability of one's mortality; that's when real spiritual healing begins to take place. In my mind, then, this alone is the only argument that's needed for the protection and restoration of primal wilderness: give us untamed places so that we may have the opportunity to come home to ourselves.

To this end, I would add, may grizzly bears always roam the Earth. And all the other fearsome creatures, too. Let's hear it for killer sharks and vipers and poisonous spiders. Unfurl the flag for crocodiles and sea snakes. Up with lions and tigers and rampaging elephants. Three cheers for panthers. And let's not forget polar bears. You want terror, those white demons creeping across an ice flow like a stalking cat, thinking you're a ring seal, now that can turn the hardest heart to jelly. Hold on all you wild terrifying predators—keep scaring us, because there's some hope that the tide of human consciousness is turning. I see evidence. Like what one of the interviewees in the Bitterroot grizzly reintroduction poll had to say: “I support it because I can't think of any reason not to.” Now that kind of thinking I like. ☾

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Coming Home to the Wild



Author's Introduction

by Florence R. Shepard

*In summer of 1998, Alan Watson of the Aldo Leopold Research Institute invited me to participate in the Sixth World Wilderness Congress in Bangalore, India from October 24–29, 1998. He asked me to summarize Paul Shepard's ideas on "wildness and wilderness," as set out in his last book, *Coming Home to the Pleistocene* (Island Press, 1998). At first I was ambivalent about accepting Alan's invitation and reluctant to travel alone to Bangalore, a place that holds poignant memories for me. Paul and I had spent several months there in 1988–89 when he was conducting research for *The Others: How Animals Made Us Human* (Island Press, 1996). Along with misgivings about traveling to India alone, I feared that the experience would reawaken the deep grief over Paul's death that over time had receded from a raw wound to a more subtle kind of pain.*

But one day, in the solitude of my cabin in Wyoming, I decided to give it a try, and set to work summarizing Paul's ideas. I sat at the computer with the book (which I had edited), flipping through the pages, pulling out parts that best characterized Paul's thinking, sometimes using his very words. I wanted to present this paper for Paul—using his ideas exclusively—without interpretation or extension on my part. The project was so engrossing that I spent several days at it and in the end had before me a paper that communicated Paul's final insights.

*But a problem bothered me. Having been a professor for most of my adult life, I carry a strong sense of honesty about documenting other people's ideas. I fully intended to go back over the manuscript, inserting the proper annotations. But when I began doing so, I found it an impossible task. I had been so immersed for over a year in editing *Coming Home to the Pleistocene* that my voice and Paul's had somehow melded, so that I could not separate the two. Although I had adhered to his ideas and thoughts religiously, I could not determine where to insert quotes. In fact, the entire manuscript, except for the last few paragraphs, was a paraphrase of Paul's ideas. I decided annotation was not only impossible but unwise: Hundreds of notes, rather than clarifying, would interrupt the flow in a delivered paper as well as in the reading of the paper by others. So with this disclaimer to any of the ideas in the text and with my apologies for poor scholarship, I submit "Coming Home to the Wild" to Wild Earth's readership.**

I debated with Alan about the placement of the paper in the conference's schedule. I wanted it to be first; he favored placing it last. I deferred to his judgment and was the final presenter in his sectional meetings. Delivering this address and experiencing the overwhelmingly positive response to Paul's ideas by the audience was one of the highlights of the conference, if not of my entire life. It reinforced what I have believed since I first read Paul Shepard's words—that he was a prophet and a visionary.

*I have also granted permission to the US Forest Service to publish it in their proceedings of the Sixth World Wilderness Congress (Watson, Alan E., and Greg Aplet. 1999. Personal, Societal, and Ecological Values of Wilderness: Sixth World Wilderness Congress. Proceedings on Research, Management, and Allocation, Vol. II, proc. RMRS-P-000. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station).



Paul Shepard's book, Coming Home to the Pleistocene, written during the last months of his life, is like a mirror held before us "thinking animals" that reflects our primal human being. This image, if comprehended and lived fully, Paul counseled, can make us at home on Planet Earth, rather than ecological misfits. We recognize this image, for at the heart of our identity is a fundamentally wild being, one who finds in the whole of wild Nature all that is true and beautiful in this world.

In his address at the Fifth World Wilderness Congress in 1993, Paul put forth more assertively than ever before an idea he had been tracking for years. We are, he proclaimed, *wild to the core*. Furthermore, our self-consciousness and worldview are based not on the teachings of civilization, but rather on the biological legacy as well as the cultural influences passed on from our ancestors, the Pleistocene hunter/gatherers.

He elaborated further: Our genome, the genetic inheritance that identifies us as humans, has remained relatively unchanged

for the past 10,000 years. When we walked out of the Pleistocene we were essentially the same beings as we are today. In fact, because of the slow mutation rate of genes in humans, our genome is essentially as it was 100,000 years ago when ancestral humans roamed the Earth. And that genome, in turn, was the culmination of the evolutionary change in still more ancient primate ancestors whose brain size and body weight increased threefold in the relatively short span of two million years. We are, for the most part, he insisted, the same creatures who came down out of the trees on the forest edges, placed our feet firmly on the ground, looked around in an innately suspicious primate fashion, and began the game of chasing and being chased.

Much smaller than the large carnivores, we developed the acumen to watch predators and prey around us, for we were both, and we learned from our adept fellow creatures. Animals became our teachers, shaped our perception and cognition, and gave us the basis for music, dance, ceremony, and language.

From the beginning we were omnivorous and gathered what was plentiful to eat, understood the phenology of the seasons, hunted accessible small animals, and scavenged large dead bodies. Paul insisted that our most prized cognitive skills—the ability to think and plan ahead, to match our intellect with others in collaboration, to synthesize many bits of information in appraising situations, to read signs, to create symbols that convey information, to design beautiful artistic expressions, to find joy in music and celebration and communion, to overcome obstacles through the use of cunning, and to relate existence to the cosmos and acknowledge the spirit world—were not the legacy of civilization but were bequeathed us by our hunter/gatherer forebears.

But our cunning has turned against us in these last 10,000 years as we have overstepped our human bounds and ignored the “limits of the natural order” (Turner 1998). We have changed the face of the Earth more rapidly and more destructively than any meteoric catastrophe; our mindless exploitation of Earth’s limited resources has placed this planet in an ecological crisis since the turn of this century. These changes came about as the result of two concomitant movements:

- through the domestication of plants and animals and the sedentary life that agriculture promulgated; and
- through pastoralism, the keeping of herds that created the conditions for ownership, surplus, and scarcity that stratified humans into classes. And with the horse and its harnessed power came the capacity for invading and conquering others.

Along with these changes in lifestyle arose a different spirituality. Mounted powerfully on prancing steeds, we turned our eyes and hearts away from the spiritual and ecological sustenance of the Earth and looked skyward for a god or gods to save us from an earthly existence. We began to see life not as a seamless intertwining of past and present, but as a linear set of chronological events beginning in the past, coming to the present, and leading on to the future. This life was not enough to satisfy us; we wanted paradise and immortality. We abandoned the wisdom of our own instincts, denied death as a part of the ever-renewing cycle of life, and, in the end, rejected the numinous Earth as the source of life in favor of a material world where we were supreme, rational beings.

This turning away from the wisdom of the Earth worried Paul Shepard in his later years. However, during the first two decades of his adulthood, he lived an optimistic, tempestuous life of environmental activism. In the early 1970s, he “became

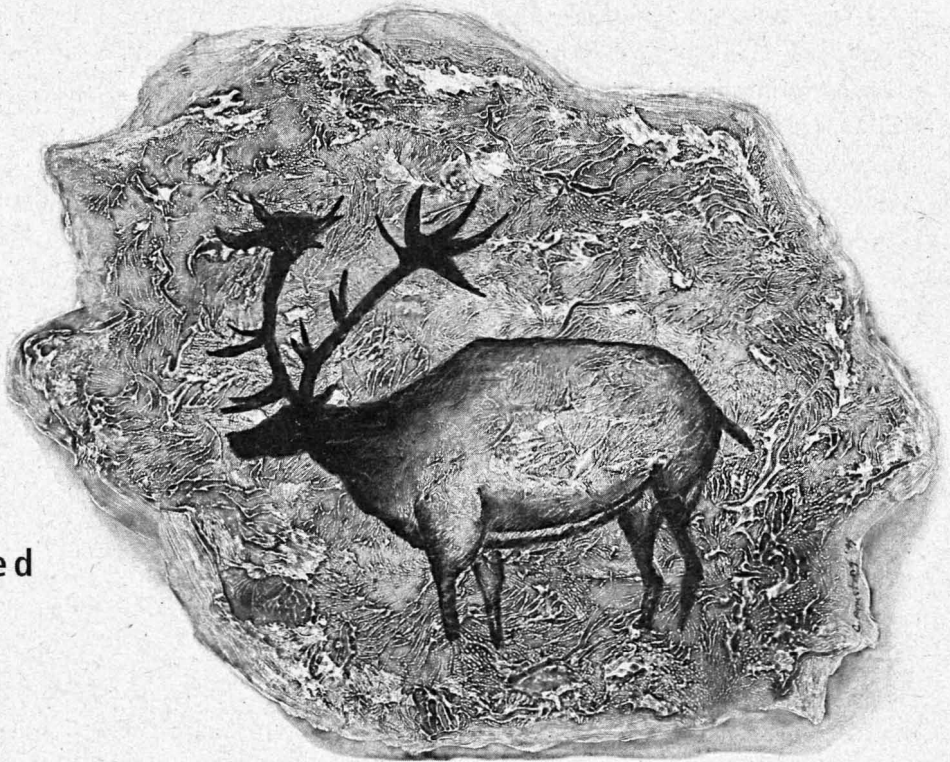
disillusioned with the environmental movement...and no longer believed that understanding the meaning of ecology would make any difference in turning the public’s consumptive mind to a more sustainable economy” (Shepard 1998). At that time he began looking deeper into the origins of our problems and in his writing presented what some think was a prophetic and visionary message. This thoughtful enterprise led him to explain Western perceptions of ecology, animals as the language of Nature, and the ontological (developmental) framework of the human life cycle. Through his research he became firmly bonded to the ancient hunter/gatherers and dreamed of a time when there was no distinction between the wild and the tame. This thinking led him to discern the differences between the concepts of wildness and wilderness.

Wildness, he said, is the state of our genome, our evolved genetic endowment that has been honed by evolution over millions of years. Like other uncontrolled creatures on Earth, he maintained, we are a wild species because our genome has not been altered with certain ends in mind as have the genomes of domesticated plants and animals that humans have manipulated for our own purposes. Paul agreed with philosopher Holmes Rolston who said that wildness is not just something “behind” and separated from ourselves, but is the “generating matrix” for what we are (Rolston 1983). Although we have taught each other social and cultural conventions in order to live together, and although we are creatures that can adapt to deficient environments, we are more at peace, less stressed, and more sane in environments that resemble the ones in which we evolved. The primal landscape, Paul reminded us, is still etched on our brains and is recognizable and familiar to us. Without it, he insisted, we are ecological misfits and often physical and mental wrecks.

Wilderness, on the other hand, is both a cognitive construction and a place we have dedicated to wildness that provides the optimal conditions for the wild genome’s elaboration. We think of it as a place set aside, a realm of purification outside civilization with beneficial, therapeutic qualities, a release from the overdeveloped environment and the disease of domestication. But we take wilderness too literally, too legalistically, he advised, and in the process we lose the meaning for which it was intended, the place where wildness can flourish.

Early in his career Paul Shepard gave up writing and thinking about wilderness landscapes as a key to our sense of Nature. He felt we had been corrupted not only by domestication but also by the conventions of Nature aesthetics, where we had been steered by Freud’s psychology depicting us as creatures destined to suppress sexual or combative urges. Nature, Paul asserted, has been oversold for four centuries as an aesthetic as opposed to a

Wildness cannot be captured on film or on canvas; wildness is what we kill and eat because we, too, are wild and are also eaten. We are a part of a sacred trophic community.



religious experience—even the spiritual uplift of wilderness is burdened with our egocentric human purposes. When wilderness became a subject matter in art, the criteria of excellence became technique. In such a context the real landscape is objectified and distanced through photography or landscape painting, or for that matter, through Nature writing. As a consequence of this abstraction of Nature as art, masses of people who are not interested in art analysis regard the extinction of animals, destruction of old-growth forests, pollution of the sea, and the whole range of environmentalist angst as “elitist.” Wildness, he cautioned, cannot be captured on film or on canvas; wildness is what we kill and eat because we, too, are wild and are also eaten. We are a part of a sacred trophic community.

Paul warned us that the corporate world has drawn our attention away from wildness by negotiating parcels of wilderness too small to allow random play of genes. This establishes a dichotomy of places and banishes wild forms to enclaves where they are encountered by audiences, while the business of domesticating and denuding the planet proceeds unabated.

IN A CLOSING STATEMENT OF HIS LAST BOOK, PAUL declared his own “primal closure.” “We ‘go back,’” he said, “with each day...with the rising and setting of the sun, each turning of the globe...to forms of earlier generations....We

cannot avoid the inherent and essential demands of an ancient, repetitive pattern.” He implored us to return to the integrity of our genes, to trust them and follow their lead, and to acknowledge our ontogeny, the biological pattern of growth and development during our life cycle that we inherited from our primal ancestors.

Our lifelong development brings physical changes that occur rapidly during the first years of life and with these changes come differing psychosocial responses. To these changes within each of us, however, there must be appropriate responses in the culture to mitigate our neoteny. Neoteny is that strange immaturity retained by humans that makes us dependent on others and on the culture for help and support throughout our life cycle as we confront critical life passages.

Young children require the firm nurturing of loving caregivers, but as they grow and become more self-sufficient they increasingly need opportunities for exploration in Nature. Their cognitive development begins with the taxonomy of animals, who are like us and yet so different, who provide not only the basis for language categories but also the psychological basis for otherness, the understanding of difference apart from the self. These initial explorations in childhood promote identity formation as well as develop our capacity for symbolic and metaphorical thought.

Progressively more independent explorations in familiar terrain widen and deepen children's experience. These explorations begin with the topography of their mother's and their own bodies and move outward until their identity takes in other creatures as well as their surrounds. As adolescents, the recognition of universe and cosmos blossoms, and, at this time, their astonishing zeal should be accompanied by story and music and celebration from the adult community to match their expanding cognition and spirituality.

In the ideal world of our ancestors, children and youth, as well as adults, live lives richly textured with play, sound, and movement and shared in common with people of various ages. Segregation by age groups is not a wise practice, Paul advised. Without close contact and mentoring—preferably by adults who are not parents—youths, longing for affiliation, congregate in groups (gangs) and try in their own immature ways to “grow themselves up.” But without guidance and bonding to Nature and its wild creatures, they grow into immature adults, ignorant of their place in an ecologically sustainable community.

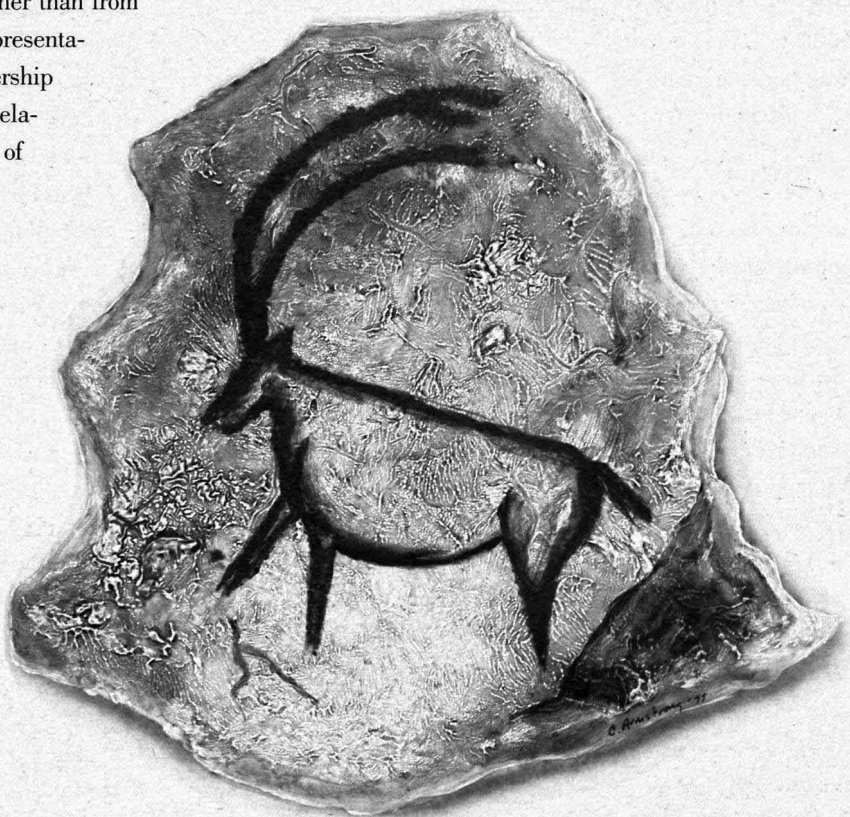
In a neo-primal community centered in place, adults find full and active lives with emphasis on small group collaboration, some independent family subsistence and sharing, self-restraint in accumulation of material wealth, diverse activities, and less emphasis upon the individual household and more on the sharing community. Prestige comes from integrity rather than from inheritance or fame. Participation and broad representation in the political realm is expected of all. Leadership is dispersed, emergent, and dynamic, and gender relations are egalitarian. Elders are important keepers of stories and are revered and cared for.

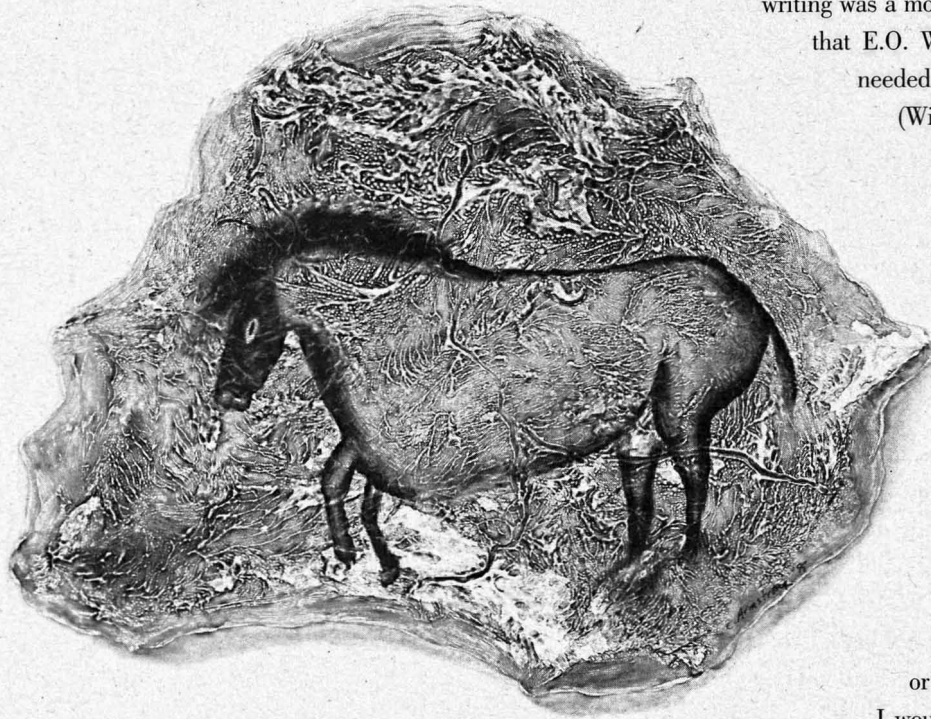
Paul used the “fire circle” as a metaphor as well as a literal example of community in which a small, cohesive group is bonded in discourse, communion, celebration, mutual support, and enlightenment—an interesting idea around which we can fashion families, communities, and work groups. Important events like birth and death are seen as the binding matrix of spiritual existence. In such a plan no one is neglected or relegated to others. No one is unimportant. We each take responsibility for others and they for us, as we give care, support, recognition, and respect.

The primal community has many applications in our modern world. It means living more firmly in place but allows for peri-

odic peregrinations or pilgrimages. With rapid communication, we have opportunities to keep our fire circle cohesive and the members strongly supportive of each other even when they are separated by continents. Narrative is a central motif. An integrated spirituality pervades all aspects of life and brings a respect for otherness. In a healthy and active community, members acknowledge their need for ceremony that makes explicit their interdependence. Welfare of other creatures and of the Earth comes first, not last, in the order of business in all arenas of decision-making. Paul Shepard saw this community closely tied to sacred trophism through the practices of hunting and gathering where omnivory is the dietary plan with sacramental rather than sacrificial trophism. Rather than restrictions, more emphasis is placed on the freedom of people to make choices to accommodate their developing psyches. This is the life cycle we inherited. This is the life cycle we should acknowledge, implored Paul Shepard.

IN TERMS OF THE LARGER VIEW, PAUL SAW A WORLD MADE up of three composite systems: genetic systems, ecosystems, and cultures. Each system is a mosaic of independent and distinct parts that are portable yet embedded and that can be exchanged and recombined in an “integrated and lively conglomerate.”





These three systems lie in horizontal proximity, each affecting the other and responding to the other. Although the genes dictate the range of feasibility, they carry millions of years of possibilities for the inter-webbing of creatures in ecosystems. Cultures arise in response to the elaborations of genes and ecosystems and can result in rich, diverse human and creature-friendly societies and environments.

We should not ignore what is possible in our own lives, within our family groups, and among our neighborhood communities. Here in this essential matrix, appropriate cultural responses can stabilize our home place and spill out into the world at large. But our purpose in formulating plans must be to be true to wild nature within and outside of ourselves. Our wildness, as Paul saw it, is not some dream of a future paradise, but aspects of community within which our primal ancestors lived. We have only to go back to this wisdom and bring it into our lives in every way possible.

We are all brothers and sisters in our genetic endowments, essentially alike, essentially wild. Cultures may differ in their ecological integrity and practices but individuals within those cultures are made from the same stuff, feel in the same way, and think and communicate in surprisingly similar modes. In his life work, Paul Shepard chose to think about our wild nature within a greater ecological community. He worked through the errors we have made, pointed them out to us, and hoped that we will pick up his work and carry it forward. Throughout his life, his

writing was a model of consilience, the unity of knowledge that E.O. Wilson has told us in his recent book is needed if we are going to preserve life on Earth (Wilson 1998).

I SPEND SOME TIME EACH YEAR IN A cabin in the Hoback Basin in the Greater Yellowstone Bioregion of the Northern Rockies of North America. Designated Wildernesses as well as healthy public lands and National Parks abound in this region. The headwaters of three great rivers in the West are born here. If anyone were to say to me that Wilderness Areas are a thing of the past, that they cannot be sustained, that they are not important or needed, or that it is too late for wilderness, I would argue steadfastly. Granted, my idea of wilderness is unique to the place where I live; there

are other definitions of wilderness throughout the world, appropriate to other cultures and other bioregions. But, as Paul Shepard told us, at base they must have one common purpose. They must be places that sustain *wildness*, where the free play of genes is allowed to take its course.

We can view and define wilderness from differing cultural perspectives, but when we talk about the wild, we are, I believe, of one heart and mind. There is nothing relativistic about wilderness, nothing to be negotiated. Genes are either wild or they have been tamed. Wildness does not depend on the context. It is something fundamental to all our understandings; it is not culturally based or socially constructed. We can all recognize wildness when we see and hear it for it resonates within our own essential wild nature. Wildness is the reason we are here. It is the reason we are fighting for endangered species, for wilderness designations, and for our human being. ☾

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In Defense of Anthropocentrism:

Is my title a joke? Well, not entirely, which leaves me some explaining to do.

The issue is intellectual honesty. We humans are creatures of the Pleistocene, alert storytellers, hunter-gatherers who evolved in forest and on savannah. Only by some accident of history did we end up careening down a freeway simply to get to an office and sit all day, staring vacantly into a computer screen, crunching numbers. We were likely more “anthropocentric” during the Pleistocene, more keenly aware of who we were and where and how we were situated in the landscape. Nowadays most Americans are *not centered at all* but lost in cyberspace, cast adrift in the “geography of nowhere” between suburbia, boob-tube culture, the freeway, and a large glass building.

A crucial distinction needs to be made: between *ideological* anthropocentrism characterized by the Cartesian split, arrogance, technological heroism, affluence, unlimited development of natural resources justified by dominion theology (which is a bogus reading of the Bible anyway) and *biological* anthropocentrism, which is simply seeing, experiencing, living in the world from a human point of view. As to the latter, I do not know how we can be in the world in any other way. Since we have large brains, binocular vision, amazing digital dexterity, and are bipedal, slow runners with only an average sense of smell, we obviously will not perceive or react to the world the same way a pronghorn, with superior speed, or a grizzly, with superior strength and sense of smell, will experience the world. And, of course, a grizzly and a pronghorn experience the world exclusively from their point of view and likely act in self-interest. Especially the GRIZ, who rather insists on a grizzly-centric point of view and will chase out anyone who disagrees with it.

Modern alienation from the wild Earth is merely a product of the wrong kind of anthropocentrism. But I don't think we can solve the problem of ideological anthropocentrism by the proposed alternative point of view, “biocentrism.” Some of the principles of “biocentrism” contain a great deal of merit: “biocentrism” posits a comprehensive worldview that sees humans as biological creatures no more or less intrinsically valuable than any other creature; therefore, human self-interest does not have priority over the ecological integrity and health of the biosphere.

“Biocentrism,” though, is an oxymoron: how can we think *biocentrically*, when the biosphere has *no center*, only circumference within which exists an infinitely complex tangle of interrelationships that humans cannot even begin to comprehend? Much of our world remains a mystery and we ought to stop behaving as know-it-alls. We are simply arrogant if we believe our thinking can achieve a “biocentric” level of omniscience.

A crucial distinction needs to be made: between which is simply seeing, experiencing, living in

by Carl D. Esbjornson

A Wilderness Proposal

The real issue is defining a better kind of “anthropocentrism,” a biological rather than egocentric consciousness that recognizes two fundamental truths:

1) Human activity, no matter how ecologically conscious and benign, has an impact on the Earth. Our dominion over the Earth is not just a biblical precept but a biological fact: humans have large brains and manual dexterity; we are successful generalists because of our ability to shape and manipulate our environment. Even if we, like the native peoples of the Arctic, were to adopt an intuitive sense of fellow creatureliness with other animals, we still cannot escape our biological fate as dominant creatures. We can, however, radically alter the way we exercise dominion, which leads to my next point.

2) We share this planet with many other living creatures. We even compete with them, which can lead to extinction of other species if we don't watch out. And we damn well better watch out. Author Bill Kittredge says that our stories can heal us, that what we need is better stories, new myths, because the old one of Nature conquest—frontier over-aggression—is not working, which is very evident in the American West, where I live.

Biological anthropocentrism, by necessarily including human beings, implies the end of the “separate-but-equal” doctrine of wilderness that has driven much of wilderness thought in this century—wilderness “where man is a visitor who does not remain.” I do not wish to repudiate Howard Zahniser's classical definition of wilderness, which I consider along with Aldo Leopold's “land ethic” one of the two greatest ideas of the 20th century; I wish only to build upon it. We should enact that definition in a series of connected self-regulating core preserves where humans can visit but are not allowed to inhabit or exploit. But, we also need to step outside



**ideological anthropocentrism...and biological anthropocentrism,
the world from a human point of view.**

the boundaries of core wilderness areas to address the thornier, more difficult truth about how we see ourselves in the world, how we ought to be a part of the world.

For starters we need to revisit the significant works already written on this issue, including Gary Paul Nabhan's *Cultures of Habitat*, Gary Snyder's *Practice of the Wild*, and Wendell Berry's *Home Economics*, books whose exploration of human economies can lead us right back into an honest, intelligent discussion of how best to carry out a program of massive ecological restoration and wildlands conservation. We can no longer abdicate responsibility by simply pouring the foundation of wilderness preservation without building a house upon it; we cannot simply set aside Wilderness and continue driving Sport Utility Vehicles. As a dominant and successful generalist species, we need to choose; we need to accept, come to terms with, and limit our dominance; we need to form a relationship with our fellow creatures based on respect and generosity.

Another problem with "biocentrism" is that critics sometimes accuse its proponents of misanthropy. That is an unfair criticism. Even so, on rare occasions I detect an attitude, a tone in some of the rhetoric of the "biocentric" view, not stated but present, behind the words, a spirit presiding in the little lower layer of its discourse. I think I recognize this presiding spirit because I grew up Lutheran. I think a few Catholics would recognize it, too. I think the Puritans most certainly would have recognized it. So would the Jonathan Edwards of "Sinners in the Hands of an Angry God." It is an unrelieved gloom about humanity. We are this loathsome spider, capable of only the most relentless depravity. We are oafish, wanton, gluttonous, copulating, fornicating, procreating, greedy, short-sighted, selfish, and self-righteous beasts.

It's true. We are. But I am not keen on all this sackcloth anthro-flagellation. I prefer simply to have a good laugh at human folly—and then to get down to the real work. But let us not work too hard. We are not going to save the Earth—or destroy it. Earth will save itself; and, if humans overstep our carrying capacity by means of overpopulation, overconsumption, and overproduction, we'll die off. As Yogi Berra once said, "Nature bats last." Conservation is not about saving the planet; it is about the preservation of wildness, which means the preservation of biodiversity—and our humanity.

So let us enjoy being human, for our species has some really fine qualities if only we'd acknowledge them. Let us leave enough time for friends and family, for laughter, singing, and dancing for joy, for telling stories around the campfire; time, too, for volunteering in our communities, attending church or temple, and getting out into the wilderness where we belong.

Then let us make a reasonably intelligent effort to ask the right questions about why we need to attempt this ambitious program of wildlands restoration and preservation.

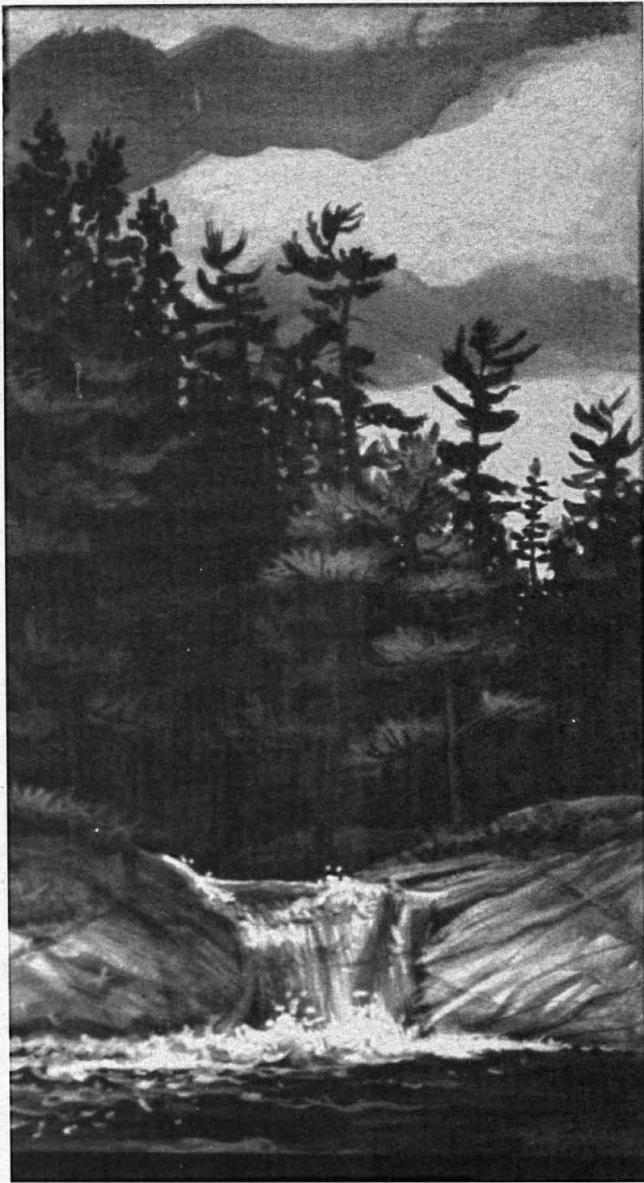
I'll begin with my own.

One reason I support wilderness is why many people do: without wilderness, there is only diminished life, a world dominated by concrete, machines, and angry crowds of people bewildered by alienation but not knowing why because their yearning for their one true home, the wild Earth, is too deeply repressed in ancestral memory. Wilderness, according to Wallace Stegner, formed our character as an American people; it is our "geography of hope." Wilderness, according to Ed Abbey, has political value; it is the last refuge of liberty for men and women who yearn to be free, including free to hunt, fish, confront physical challenge and even danger, to enjoy solitude, to be eyewitnesses to the wild beauty of Nature.

Living on a wild Earth will be more difficult, more challenging, more dangerous, and much more fun than the way we live today. Living on a wild Earth will require more alertness, skill, savvy, and vigor; in short, it will make us more fully human, more fully alive, because life will have an edge, a meaningfulness, quality, variety, and richness that it simply does not have in our droning industrial society.

A culture of wildness will also, necessarily, call for a much smaller scale, more leisurely, decentralized, tribal, communal, or democratic organization of society; it would make knowledge of geography, especially local geography, indispensable. A localized culture would not solve the nagging problems of human greed and violence and limited intelligence, but without a large-scale, highly centralized, impersonal, totalitarian organization of society, there would be more accountability. An individual could no longer hide behind the glass walls of all our incorrigible institutions—academic, governmental, business, financial. Bureaucracies could no longer pass the buck. The tribe or community would have to agree with a particular action, and in a culture of wildness we would also have to consult the GRIZ and the lay of the land before acting on our decision. Abuses still would occur as they always have occurred in any human society, but the negative effects would be far less, much more measured, and easier to correct. The real issue, again, is placing limits on our domination of the planet.

These are all excellent reasons for preserving wilderness, and they represent a distinctly "anthropocentric" point of view—we have lost home, and it is time we come home, again, to the wild. After making every effort to relate to, appreciate, and absorb the "biocentric" view to no avail, I keep returning to the truth: like the grizzly bear, we have suffered loss of habitat; we



are imperiled by the industrial economy and the destruction of wildlands. No, humans are not listed as Endangered under the auspices of the Endangered Species Act; in the spirit of our age, the ESA operates according to a merely quantitative standard—and by sheer numbers we greatly outnumber the grizzly bear. But we *are* endangered. Industrialism has not produced more ease, comfort, or convenience; it has been nothing but a diaspora, a journey into hell, into bewilderment, longing, and the most profound spiritual emptiness. Into exile. Like the Israelites in Babylon, we pine away by the banks of the river. It's as simple as that. We want to go home. I know I do.

Coming home, again, to the wild means figuring out how we can go about our business in a way that leaves room for bears, wolves, and humpback whales; wilderness is not just our home—it is home to millions of other species as well, each with their own rights to life and liberty. How can we apply our meager knowledge and limited intelligence to inhabiting whole

ecosystems and watersheds without destroying them? How can we alter them (for I am not always against altering) without simplifying them? And, of course, how can we engender respect for all living things—for banana slugs and mosquitoes, and other creatures we may neither understand nor appreciate, but nonetheless are part of the wild Earth?

A REWILDED EARTH WOULD BENEFIT HUMANITY GREATLY; it would be in our self-interest. And it would serve the interests of our fellow creatures a lot more. No matter what, I remain at heart an optimist: this tough, old, lovely planet has survived plate tectonics, mass extinctions, collisions with comets and asteroids; it *will* survive ideological anthropocentrism and our poor excuse for a civilization. So to all enviro-conservationist doom-mongers, I bring you tidings of great joy. The prospects for industrial civilization are bleak. Evolutionary biology should teach us that anything this ugly, gross, over-aggressive, self-defeating, and stupid cannot last. If nothing else, the Second Law of Thermodynamics will soon make short work of industrialism in the next century. Mechanized civilization will burn itself out and biological, geological, and cosmological time will reassert itself. For time is measured by entropy, and accelerated time in modern industrial society means accelerated entropy.

Sure, industrialism is behind the diminishment of wildness everywhere in the 20th century as the global-economic techno-industrial behemoth walks the Earth, like Francisco Goya's spooky colossus. Yet industrialism, despite its utter domination of the planet—*because* of its utter domination of our planet—is in its death throes: evidence of its failure—the general breakdown of civil society along with human and planetary health—is everywhere. Like the dying of any rough beast, this will not be pretty, but, if we plan ahead, we may effect a reasonable though somewhat painful transition, without cataclysm and the end of high civilization as we know it. Preparation for the inevitable demise of industrialism could be among the good arguments for visionary and meaningful conservation. The repressed yearning for wildness that I believe resides in the hearts of most humans may eventually reach critical mass and enact the necessary comprehensive cultural transformation, the marriage of high technological sophistication with a Paleolithic sense of closeness to the Earth. In wildness, humans may recover their deepest humanity, and in wilderness, the diversity of life may flourish. ☾

Writer and conservation activist Carl Esbjornson (whose last name means "son of the Bear God") lives in Bozeman, Montana. His work has appeared in various publications, including Environmental Ethics, Sierra, Wild Earth, and others.

The Ark of the Habitat

Taking the Rainbow Seriously

by Kelpie Wilson

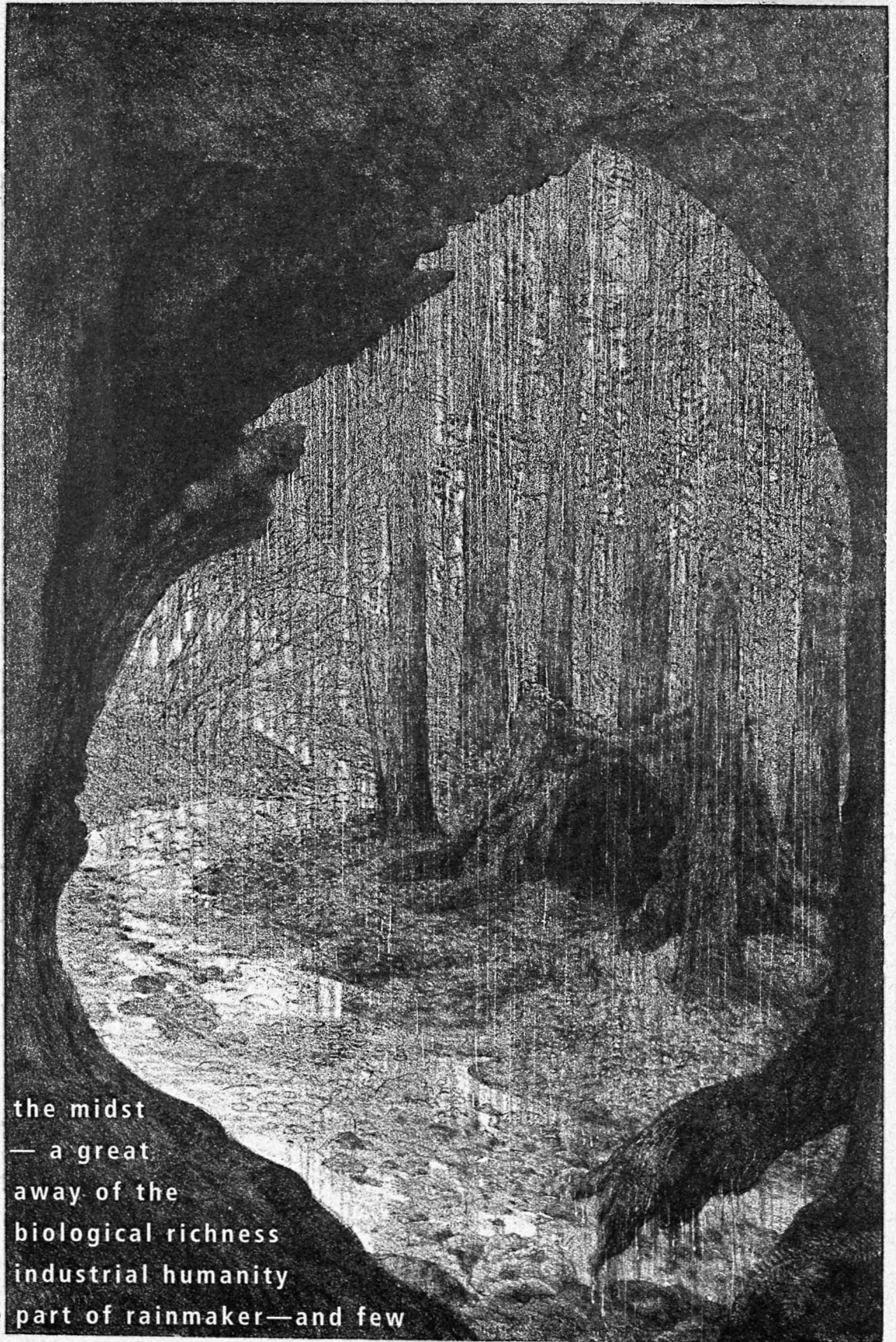
The biodiversity protection movement is guiding the most important social and cultural transformation of our time, only not everyone realizes it yet. Growing up in the sixties I saw the ideals of Peace and Justice mobilize a whole generation. Stopping the war on the Earth will require us to enlist the most powerful ideals we have and to think big, really big—even beyond concepts like Peace and Justice. Most of us in the environmental movement tend to approach our work as piecemeal issues: we talk of saving forests, cleaning up rivers, or stopping mines, when what we need to be talking about is Saving Creation.

Our most powerful ideals are still religious ones. Tom Hayden, in his book *The Lost Gospel of the Planet Earth*, shows that at the root of all religions is a reverence for the Earth and all Creation. The great modern religions, Christianity, Judaism, Islam, and Buddhism, have wandered far in search of transcendence, yet the root of Earth love still anchors these traditions to the ground, if only by a thread. Because new human consciousness sprouts best from the old, we must nurture these roots. Modern Christianity achieved its flowering through a slow process over centuries of incorporating older pagan traditions and modification of these traditions to suit a Christian theological framework.

Human culture is a continuous story that has been told and retold for 30,000 years or more. If we look at the images of the late Stone Age, we can recognize stories that are still comprehensible today in the hunting magic of the painted bison, the stone Lady of Laussel with her horn of plenty, and in the images of spirit birds that prefigure angels. Stories build on stories, just as the cave paintings often show animals painted over and merging with other, earlier paintings. Culture is not simply the story itself: it is the act of telling and retelling, painting and repainting the picture.

Our job now is to find the pentimento, the traces of earlier stories that shine through in our culture and give us what we most need today. We can build on these traces and paint a new, meaningful layer that resonates with the majority in our culture. One such story that we might retell is the story of Noah's Ark, known to us from Genesis in the Old Testament.

The Genesis Noah story instructs people to care for Creation. Because God was angry and disgusted with the corruption of the people He had created, He wanted to wipe the slate clean and start over. He commanded Noah, the one good man, to build an ark and stock it with two of every kind of creature. God makes it very clear to Noah what he must do. He repeatedly issues the commandment to include every living thing, "every creeping thing that creepeth upon the earth," not just the cattle and sheep, and animals perceived as useful. Since he is a good man, Noah obeys and loads them all, two by two.



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Later, when the land has dried out and all the creatures are sent forth to be fruitful and multiply, God establishes the dominion relationship between man and the rest of Creation. God decrees: "Every moving thing that lives shall be food for you. I have given you all things, even as the green herbs." Then God sets a rainbow in the sky as the token of the covenant that He makes directly with "every living creature of all flesh": that never again will He destroy them. Thus God gives Noah's descendants the right to consume the flesh of creatures but not to destroy them. This is a revelation to those of us who know the Christian concept of dominion from the likes of James Watt. Stewardship is an awesome responsibility, not a "takings permit."

The call to stewardship expressed in the Ark story is a powerful message, and it is one we must use in our mission to save Creation, if for no other reason than that the vast majority of Americans consider themselves Christians. But pandering to a particular belief system is not the objective. E.O. Wilson surmises that no matter how far science may extend its explanatory powers in "consilient" directions, humans will always require a "sacred narrative" to provide both meaning and hope. It's in our nature.

As a sacred narrative, the story of the Ark has something for everyone. Cross-culturally, the story of a great deluge is ubiquitous. Joseph Campbell, in his work on the science of myth, includes the flood as one of a few primal themes (e.g., the theft of fire, virgin birth, the land of the dead, and the resurrected hero) that appears over and over in mythology worldwide. The Noah story itself is based on an ancient Sumerian flood myth at least five thousand years old. Good King Ziusudra is the Sumerian Noah, and the Goddess Ishtar plays the role of rainbow covenant maker. In India there is a Noah figure called Manu, and in China he is called the Great King Yu. The Greeks had Deucalion, son of Prometheus, who survived the deluge to repopulate the Earth with his wife Pyrrha. The Irish tell myths of founders who were the direct descendants of flood survivors.

One survey of flood myths found 500 such stories, 62 of which were shown to be entirely independent of the Middle Eastern accounts (Frederick A. Filby, *The Flood Reconsidered*). The myths are found in Asia, Europe, the Americas, Africa, Australia, and the Pacific. For instance, in the mythology of Vietnam, a brother and sister are said to have survived a great flood while stowed in a wooden chest that also contained two of every kind of animal.

In the Andean version it is a celestial llama who tells a simple llama herder of the coming flood. The two of them together gather up all the animals and the man's family to find refuge on a high mountaintop. There are similar Aztec and Mayan stories.

Other American Indian myths include a Haida tale in which an old woman causes the seas to rise when the children of the tribe mock her disrespectfully. And from the Papago people: Coyote warns that a flood will come and destroy the world. The hero Montezuma builds a boat for himself while Coyote makes his own dugout canoe by gnawing out a log. Flood myths exist in the traditions of the Inuit, the Huron, the Algonquin, the Iroquois, the Chickasaw, and the Sioux.

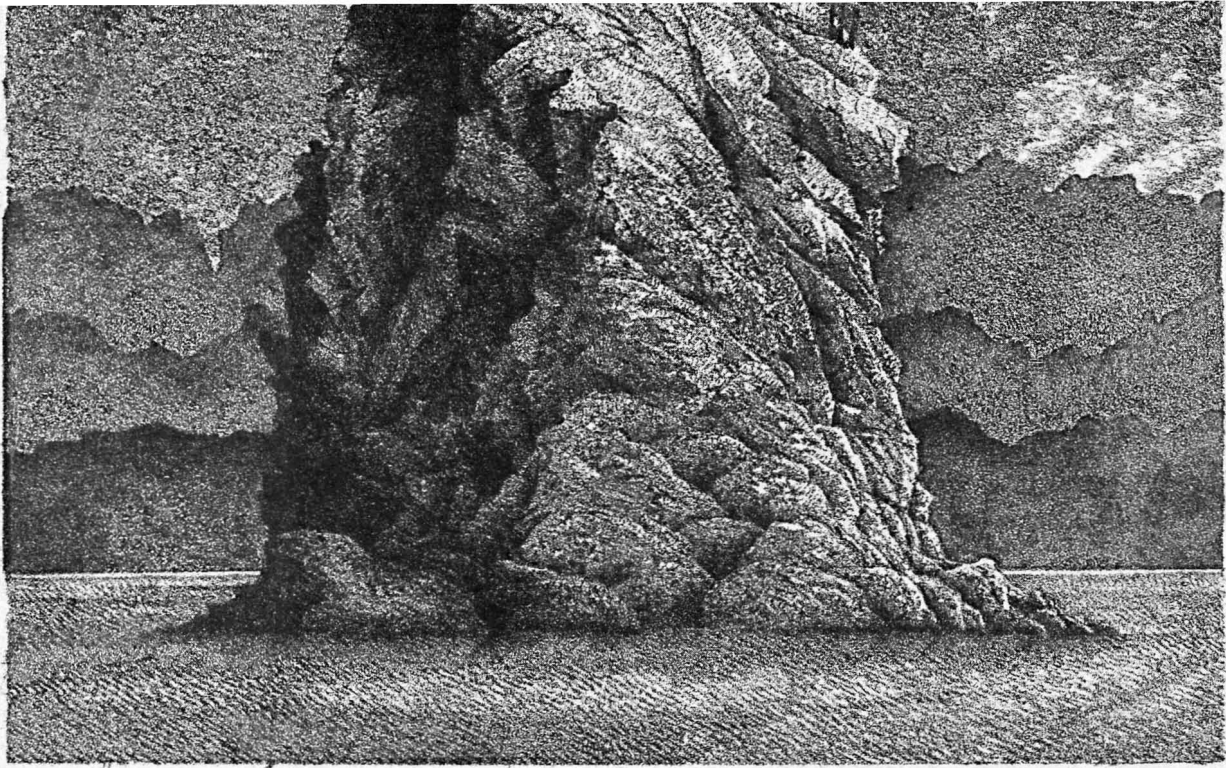
No survey of ark stories would be complete without mention of the etymological and iconographical congruities between arks as both ships and containers and as goddess symbols that represent fecundity and abundance—like the holy grail and the great bear.

WITH THE UNIVERSALITY AND RICHNESS OF THE FLOOD myth revealed, we are ready to begin layering on the new story, starting with the scientific knowledge of historical floods. The end of the most recent ice age began about 12,000 years ago, coinciding with the beginnings of the neolithic revolution, a period of culture formation that led to agriculture, weapons of war, and eventually writing. Over a period of thousands of years, melting ice caused the seas to rise by 200 feet around the world. Many sites of human habitation must have been inundated. Aboriginal Australians have myths of former hunting grounds that form accurate mental maps of 10,000-year-old coastlines that have since been covered by rising waters.

Recently, geologists have shown that around 5600 BC, a large freshwater lake that became the Black Sea was inundated by an onslaught of salt water from the Mediterranean when the straits of the Bosphorus opened suddenly over a period of days (Doug McInnis, "The Real Genesis Flood," *Earth* 8:98). The people who lived along the shores of the lake would have fled to high ground and then into Europe and Mesopotamia, carrying a flood story with them.

Perhaps more interesting than the empirical evidence for the deluge are the psychological implications of the myth. The flood story may help us understand the structure of the human mind from the very beginnings of culture formation. I believe it says two things about humans as a species. First, the flood always occurs because humans have behaved badly: they are not living in harmony with the universal laws as their Creator intended, so the flood is sent as punishment and as a cleansing. This suggests that we know or are capable of knowing how to live in right relationship with the Earth, but we need to be vigilant and make sure we keep the laws.

Second, and more important for our mission of saving Creation, is the response of the people to the flood: they always



take care to save all the seeds of life. The people don't use the opportunity to do away with inconvenient species such as spiders or snakes or tigers; they understand that everything is God's Creation, and they know it's not for them to decide what's good and what's not. They also are not concerned with keeping the ephemeral works of man; they don't embark with swords or gold jewelry, or even tools like hammers and plows. That stuff isn't important.

In modern times, the deluge is us—from our overwhelming and expanding numbers to our endless accumulation of stuff. It is, after all, the works of man—the housing developments and shanty towns, the farms and factories, the cars and roads, the shopping malls and landfills full of Wal-Mart trash—that are wiping out the seeds of life. We desperately need a story to help us see through this flood of detritus to what is truly important.

I think we can see through to what matters if we are placed in the right circumstances. For instance, I live in the woods and every year, I face the fact that a forest fire could destroy my house. There is no fire protection service here, and it's a risk that I take in order to have the privilege of living in the forest. When summer starts getting hot and dry, and the needle on the Forest Service fire danger sign points to "EXTREME," I start thinking about my contingency plan. If I had to leave quickly, I would be sure to take my cat and my album of family photographs. Those things are irreplaceable. My contingency plan is like a mental map. I know where I keep my photo albums and where to find the cat (usually not far from the food bowl).

For secular environmentalists, maps are our myths. Maps show us where our biological treasures are and help us determine the dimensions of the core reserves we need to set aside to protect wilderness and wildlife. But we also need myths to map our

meanings, because maps are not yet a universal language. Most people still respond better to colorful stories than to technical diagrams. Accordingly, as we create our map-based rewilding visions, we ought to consider recalibrating our maps in mythical cubits. Since we now know that landscape-sized arks of habitat rather than zoo-sized arks are what is needed to harbor genetically diverse, healthy populations of all animals and plants, we might redefine the new cubit as the watershed. The watershed and sub-watershed are already in use as a basic "conservation unit." The watershed, as a container of life, has ark-like spatial characteristics, making it a fractional rather than a linear unit.

Myths can help us meet the challenge of helping people to see the circumstances we face. We are in the midst of a deluge—a great washing away of the planet's biological richness with industrial humanity playing the part of rainmaker—and few people even know it. Perhaps the story of Noah's Ark has enough meaning to Americans to be able to cut through the siren song of consumer culture and alert us to the fact that we are drowning and pulling down much of the world's biodiversity as we sink. We need to point to the rainbow and let it remind us that there is still hope for saving Creation. On the authority of both God and the laws of the universe, we know that it is possible to live in harmony with the Earth, but only if we get to work and build that Ark. ☾

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Not long ago, Kelpie Wilson, executive director of the Siskiyou Project, proposed the Millennial Ark as a metaphor that could accommodate the many and varied campaigns being waged at the close of this second thousand years (of the ostensibly Common Era) on behalf of life on Earth. Kelpie's metaphor is as inclusive and malleable as it is beautiful, so herewith I shall use the Millennial Ark as a platform from which to let sail forth another vision—of a North America not only spared utter annihilation at the wheels of man but actually on its way to recovery with the cooperation of humans.

Encapsulated in a few lines, the agenda might read: By 2020, fully protect all public lands as wildlife habitat, banning commercial exploitation thereon; renew and enlarge the federal Land and Water Conservation Fund (LWCF), to add to these public lands; make wildlands philanthropy an organizing theme for beneficially spending surplus wealth, such that undeveloped lands on the market are put into safe hands (land trusts, reliable public agencies, or individual conservationists); and reserve all military lands as wildlife sanctuaries.

Without attempting to fill in details that others are more qualified to draw, let me quickly sketch the outlines of the anchors needed to secure our continent's biological diversity as we enter uncharted millennial waters.

Anchoring the Millennial Ark

by John Davis



Forever Wild Protection of Public Lands

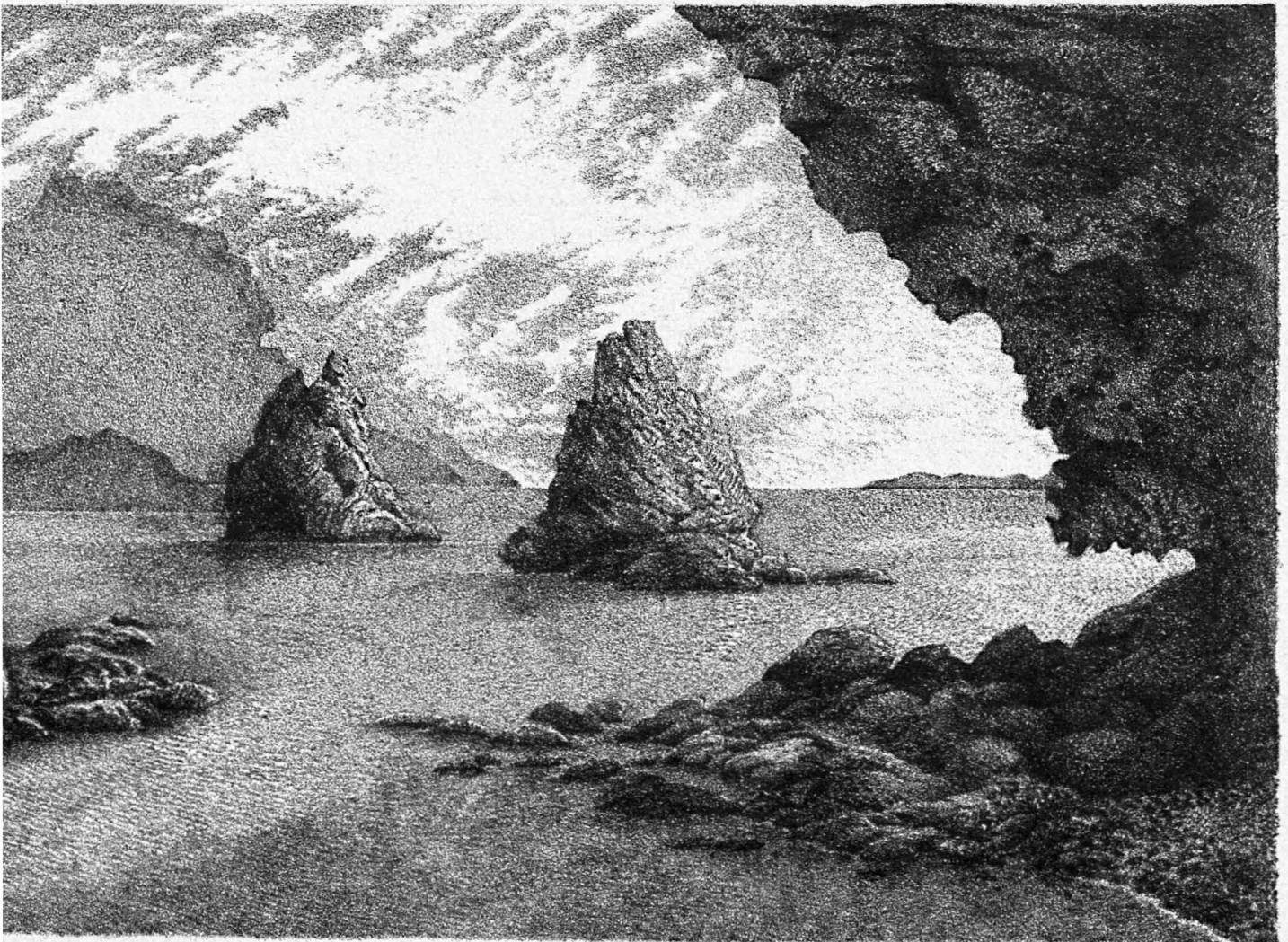
1) Conservationists should craft legislation to eliminate all commercial exploitation of federally managed public lands. (Benign uses such as wilderness guiding, small-scale herb or mushroom gathering, environmental education programs, and scientific studies could continue.) Easiest may be ending commercial logging of federal forests, then mining, then livestock grazing, then water diversions...until all public lands are public in the fullest sense.

2) Next we must close secondary roads and remove dams from federal lands.

3) Then we must do the same for county and state public lands, which should also be protected as Wilderness or Wilderness Recovery Areas, or wildlife sanctuaries where they are too small for Wilderness designation.

4) Military lands may be the hardest to reclaim (they have the missiles!) or they may be the easiest (the Defense Department, ironically, is generally kinder to its lands—occasional bombing runs notwithstanding—than are the other federal agencies); but they are ecologically crucial and should be fully protected. Increasingly throughout the world, sane defense policies will mean defense of Nature and natural resources, not manufacture of armaments.

5) Eventually, virtually all undeveloped federal lands should be admitted into one or both of our nation's greatest achievements—its National Wilderness Preservation System and its National Park System. This could ensure Forever Wild protection of nearly 800 million acres, not including additional lands we should bring into the public domain.



Wildlands Philanthropy to Secure Undeveloped Private Lands

Concomitantly, conservationists must be working to secure the millions of acres of undeveloped private and corporate lands on the market. Many of these should become part of the public domain; others might be protected by land trusts and conservancies, or by persons of substance willing to pay their dues to the source of all value, wild Nature (or Creation, or God, or Goddess, if they prefer). Such wildlands philanthropy efforts will complement our Forever Wild campaign, and may proceed roughly as follows:

1) Restore full funding of the federal Land and Water Conservation Fund. Then double, then triple it, then round it up to \$5 billion a year (at least!). If the Defense Department objects to having money for bombers used instead for wildland acquisition and protection, remind the generals that a nation's security resides mostly in its lands and waters. Remind people also that Americans could live rich and healthy lives utilizing only about a tenth of our land base—leaving the rest for wildlife and our own wilder pleasures. (Of course, we must at the same time reduce our consumption levels so that we are not living on other countries' capital.)

2) Convince this country's three million millionaires that the highest and best use of money is to buy and save land. Again, millions of relatively wild acres are on the market in North and South America; most of these will soon be developed or otherwise exploited if not brought into safe hands quickly, whether those of land trusts or individual wildlands philanthropists (such as Doug Tompkins and Ted Turner). Just how a concerted wildlands philanthropy effort will take shape remains to be seen, but a Wildlands Philanthropy Council able to leverage at least a billion dollars a year for land purchases and protection through existing land acquisition groups could really help.

3) Much of the money for a Wildlands Philanthropy Council, or a broadened and emboldened land trust movement including The Nature Conservancy, Conservation Fund, Trust for Public Land, Open Space Institute, and local land trusts, could come from charitable foundations. Presently, environmental grantmakers and other foundations are generally granting only about the five percent minimum a year required by the IRS even though their endowments are typically earning at least twice that. This surplus—which is basically profit, in organizations supposed to be nonprofit—could be devoted to purchase and protection of our continent's imperiled wildlands, and to grassroots conservation groups working toward these goals.

4) Sin taxes could be levied on all implements of destruction—motors, guns, computers, televisions, etc.—such that pur-

chase of these destructive weapons and machines would be strongly discouraged, and those who still insisted on buying them would at least partially compensate by paying dues to LWCF or some other wildlife habitat preservation fund.

5) The monies of the United Nations and its members pledged to averting anthropogenic *climatic mayhem* (which term owes its existence to Michael Perlman, a conservationist who took his own life last Earth Day in protest of humanity's war on Nature) could and should be directed largely at acquisition and protection of wild ecosystems. Carbon sequestration is, most climatologists agree, as important as emissions reductions to stem our assault on the atmosphere and global climate.

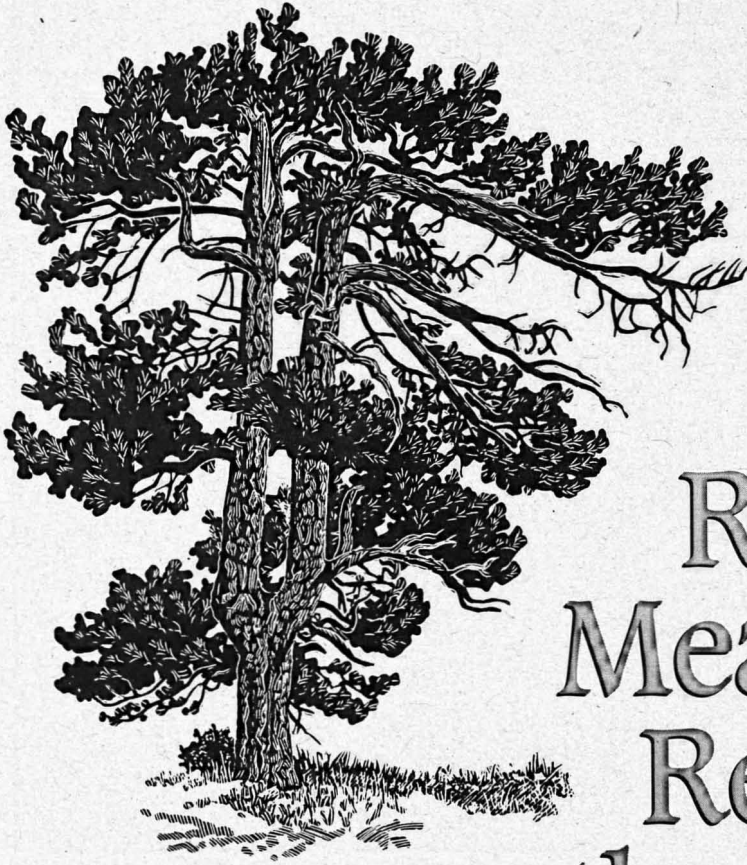
Conservation purchases of wildlands on the market could conceivably add a couple hundred million acres to US protected area networks. Even greater acreages may be available in the rest of the Americas.

CONCURRENT WITH THESE TEN STEPS AND INFORMING OR complementing them should be completion of ecological reserve designs for every region and protection of local natural areas in every town in the country—as well, of course, as lowered human birth rates and resource consumption levels. Various conservationists have noted that a big part of the work of rewilding North America can be done by local churches, schools, town planning commissions, and concerned citizens pooling their charitable gifts and minds to ensure that all kids (human and otherwise) enjoy the educational, spiritual, and recreational benefits of nearby natural areas to explore. Think of how many acres could be saved if every school and every church strove to establish and guard at least one wildlife sanctuary. Think of how much kinder and wiser people could be if all children grew up serving as guardians of a local wildlife refuge.

There, then, are ten basic steps to saving a billion or so acres of American wildlands. Canada, Mexico, and most Central and South American countries have similar wilderness recovery potential; we should be able to free almost as much land in Mexico and much more in Canada and South America.

When we founded *Wild Earth* eight years ago, we said we'd measure the New Conservation Movement's success in acres. If the conservation movement secures, say, three billion acres of wild habitat across North America in the next 20 years, and two billion in Central and South America, the Millennial Ark will have done its job—and the world will be five billion acres closer to salvation. ☺

Former Wild Earth editor John Davis is program officer for biodiversity and wilderness at the Foundation for Deep Ecology in San Francisco.



True Restoration Means Rewild the Land

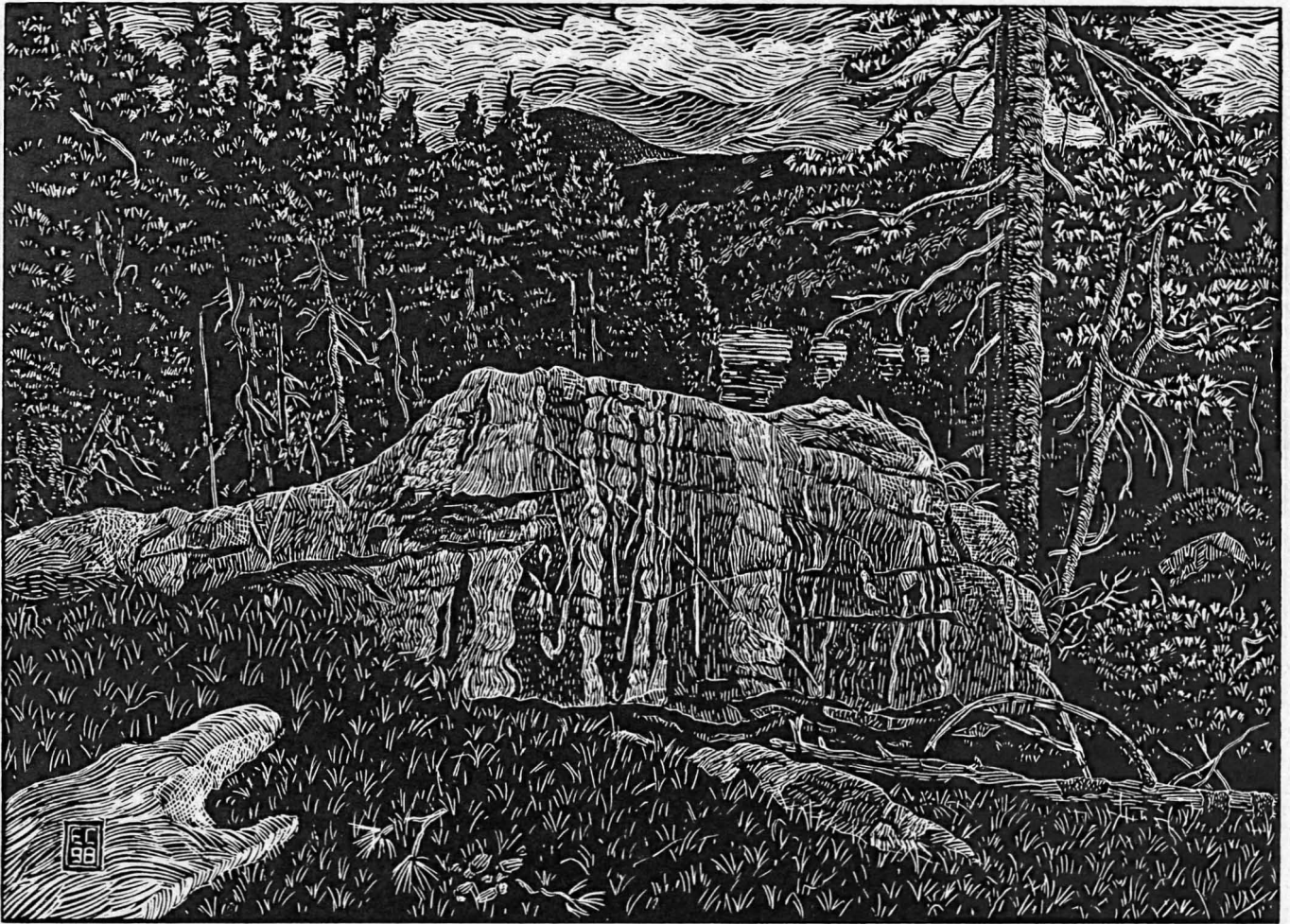
by Howie Wolke

Try to imagine the original American wilderness stretching from the teeming Atlantic estuaries to the plunging cliffs of the Pacific. Imagine an undulating, mostly unbroken green blanket of eastern old growth; then consider the sprawling forest of unlogged giant dripping conifers of the Northwest coast, the endless prairies, and the majestic and unfragmented Rocky Mountain wilds. Imagine a hundred thousand or so griz, giant flocks of Eskimo Curlew and Passenger Pigeon, and...well, you get the picture.

Of course, it's impossible to recall exactly what nobody alive today has ever seen. We suffer from a collective case of severe landscape amnesia. Yet to imagine the original America, as best we can, is to create the essential baseline image for a long-term and comprehensive conservation strategy that encompasses a broad-scale program of expansive wildland—i.e., *wilderness*—restoration. And although restoration ecology is a promising discipline, so far it lacks a clear vision of big, ecologically viable wilderness. With a few notable exceptions, agencies, media, and most conservation groups fail to embrace *wilderness* restoration.

Generally speaking, ecological restoration can be divided into three broad and sometimes indistinct categories:

- 1) the effort to *rewild* big landscapes by creating Wilderness Recovery Areas (WRAs);
- 2) landscape-scale initiatives to restore functioning natural ecosystems; this may or may not include some wilderness recovery (ongoing efforts to restore normal water flows in Florida's Everglades is one example); and
- 3) specific habitat restoration projects: smaller, localized campaigns to restore a particular salt marsh, a patch of prairie, or stand of old-growth forest.



It is common sense that restoration is a poor substitute for protection, which remains conservation's top priority. Yet conservation biologists tell us that existing wildlands are already too small, fragmented, and impacted by humans to maintain within them the multitude of processes that fan the embers of evolution. So, if our goal is to perpetuate native biological diversity, wilderness restoration must become an essential component of any viable landscape conservation strategy.

After all, real wilderness is an illusion in a fragmented landscape devoid of big hairy predators and the natural disturbance regimes that delineate true wilderness from the tame managed tracts of roadless quasi-wilderness for which we settle today. *Real* wilderness is the soul of the land, the storehouse of so much that we don't and may never know. Real wilderness benefits life on Earth in untold numbers of unimagined ways. Thus, to rewild the land is, perhaps, society's highest—if least appreciated—calling.

Unfortunately, wildland ecosystem restoration is already being derailed. For example, many dedicated conservationists have been conned into supporting unwise forest stand micro-management under the guise of a deceitful so-called forest health campaign to allegedly “restore pre-settlement forest con-

ditions.” This debate illustrates the danger of failing to equate restoration with rewilding the land.

In a nutshell, logging interests have convinced many folks that America's major forest problem is “forest health”: overzealous fire control and underzealous logging have combined to create big buildups of flammable understory fuels, overcrowded stands of trees competing for limited water and nutrients, and widespread epidemics of defoliating insects and other forest pathogens. These understory fuel buildups will lead to unnaturally intense catastrophic wildfires—unless, of course, the Forest Service logs off the excess fuels.

What's tricky about this is that it's born of a partial truth. Although the insect and disease allegations are largely fabricated, it is true that fire suppression has created fuel buildups in some forests, such as low-elevation ponderosa stands with a historic tendency toward frequent low-intensity surface fires that maintained a grassy, open, old-growth ecosystem. But the extent and uniformity of the historic parklike forest has been greatly exaggerated by logging interests who are using “forest health” as an excuse to log a variety of habitat types (including ecosystems with vastly different historic fire regimes) into an open parklike condition.

Make no mistake, I do not belittle the ecological impacts of zealous fire suppression. But the suppression occurs because foresters view forests as repositories for sawlogs, not evolutionary processes. It's vital to realize that vested interests have orchestrated an effective campaign to convince the public that our basic forest problem—in nearly every kind of forest—is too many crowded trees that must be logged in order to avert catastrophic blazes and to return the woods to a more “natural” condition (ironically, as land managers scramble to set prescribed fires and to log the woods into open parklike stands, they continue to spend big bucks squelching the vast majority of natural lightning-induced wildfires).

Of course, today's forest crisis is real. The fundamental problem is that there's too little wilderness remaining. And there's been too much management. Logging, road-building, livestock grazing, fire suppression, dams, herbicides, ATVs, ski areas, and much more have created unprecedented habitat fragmentation, erosion, hydrologic disruption, landslides, weed infestations, species declines and regional extirpations, gene pool depletion, underfuel buildups and loss of tree vigor, plus loss of solitude, loss of control areas for baseline data, etc.

A summer 1996 *Wild Earth* forum between George Wuerthner, Mark Gaffney, and Reed Noss addressed forest restoration in Oregon. Gaffney and Noss disputed Wuerthner's thesis that the best treatment for eastside Cascade ponderosa forests was to leave them alone. Nonetheless, I believe that Wuerthner's basic point is valid. And while Noss's contributions to conservation biology have been heroic, his and Gaffney's prescription for widespread restoration thinning plays right into the hands of the western wood products industry.

For one thing, the thinning will include lots of new roads in order to get the logs to mills. That's not what Noss and other ecologists recommend, but given today's Forest Service, it's what we'll get. It's what we are getting. So we further de-wild, not re-wild, the region. Moreover, because understory thinning generally produces poor sawlogs, the Forest Service typically sells many of the big pines in order to sweeten the economic pot. Thus old growth is logged in order to allegedly restore a natural old-growth forest.

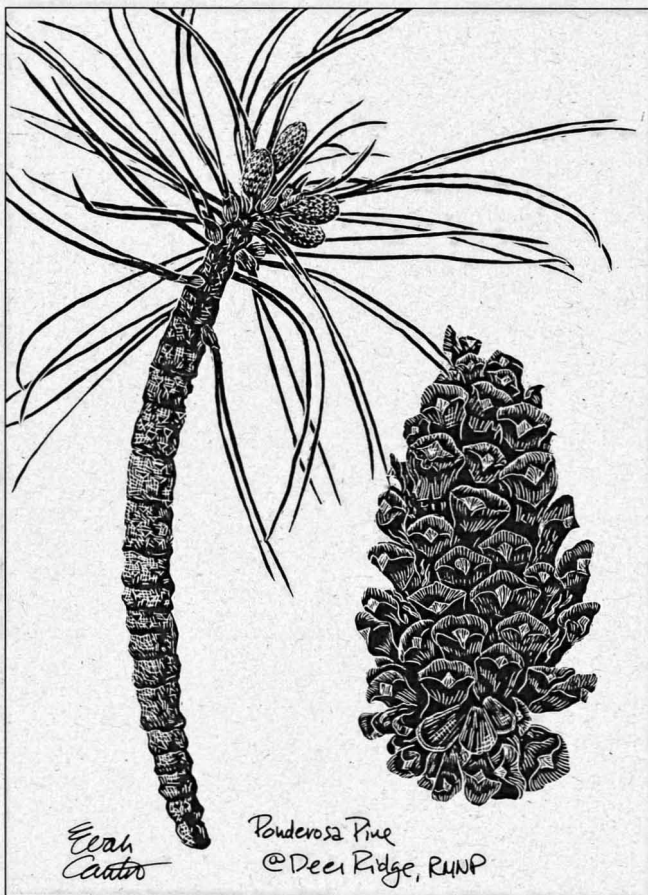
So, buying into the “forest health” sham actually gets us numerous roaded clearcuts with a few token old ponderosas left per acre, the Forest Service's mythical version of a presettlement pine savannah. This is becoming a common scenario. Despite some positive initiatives by Forest Service Chief Mike Dombeck, the Forest Service is still light-years from promoting wilderness restoration. It remains committed to wielding control over Nature and it remains populated by rangers who view trees primarily as potential boards.

It is important to reiterate that presettlement ponderosa forests were never a uniform world of open parklike old growth. Both Wuerthner and Noss discussed this in the 1996 forum. Old-growth ponderosa habitats were interspersed with a mosaic of other habitats depending upon slope, aspect, elevation, soil, hydrology, and other factors. In Idaho and western Montana, dense spruce and Douglas-fir forests naturally occur on steep north and east aspects, even at low elevations. Also, some natural wildfires historically burned into the crowns of old growth, killing most trees even in some classic open, grassy stands. And some stands escaped flames for long enough periods to nurture a dense fir understory. It is dangerous and incorrect to assume that the premanagement parklike forests were as uniform and widespread, temporally and spatially, as the Feds would have us believe.

SO WHAT DO WE DO? WE LOOK AT OUR FORESTS IN TERMS of the *fundamental* problem: too little wilderness and too much management. Again, too many roads and timber sales, too much fire suppression, too many big trees on trucks with the puny ones left behind, not to mention too many mines, oil rigs, cows, condos, and ATVs.

Therefore, we should deal with fire suppression in the context of efforts to restore big interconnected wilderness and all of its ecosystem processes. *Restore = rewild*. We avoid the quagmire of the “forest health” microdebate, and thus have a context in which to effectively dispute the deceiving generalizations being utilized to support increased logging. We promote wilderness as habitat for natural disturbance regimes, including wildfire. In fact, a primary goal is to restore natural wildfire to wildlands. In some habitats, prescribed burning to reduce flammable fuels is a necessary first step. And some preburn thinning is appropriate along the wildland/settlement interface in order to protect homes, farms, and towns. Still, some wildfires will burn into the old-growth canopy. But, in many areas, old trees will survive because even stands with dense fuel ladders often fail to cook thoroughly. In the woods, wildfire often fails to follow textbook predictions. That's another reason for forest wilderness, not forest micromanagement. Ultimately, wilderness restoration will restore old growth far more thoroughly than will attempts to micromanage it back into existence by thinning millions of acres of remote public lands.

Unfortunately, much of our landscape is heavily populated, so restoring degraded ecosystems requires intensive specific habitat restoration (SHR) efforts. To rewild much of Illinois, for instance, is a formidable task. Many and various SHR projects are appropriate, and each patch of recovering prairie or woodland



or wetland is a step in the right direction. In fact, our country is loaded with damaged lands that can be restored by burning, thinning, planting, seeding, etc. These activities are an important complement to restoring big wilderness, particularly for the many endangered ecosystems outside of the public land domain or otherwise beyond the realm of big wilderness potential. And they are a terrific way to recruit new wildlands defenders.

As Michael Soulé and Reed Noss concluded in "Rewilding and Biodiversity: Complementary Goals for Continental Conservation" (*Wild Earth* fall 1998), biodiversity protection plus rewilding equals conservation. I believe that because rewilding is so much more of a political challenge, conservation groups should emphasize it. And, as I've pointed out, by failing to emphasize rewilding, it becomes easy to be derailed into unnecessary and potentially destructive micromanagement.

Vast western landscapes are largely uninhabited public lands ripe for rewilding. Big areas of the upper Northeast and Great Lakes are either in public ownership or are large corporate holdings that could be acquired and managed as WRAs. In many ecosystems, big wilderness could easily be restored by obliterating roads, dams, buildings, and the like. Appropriate SHR projects within the larger WRAs could include erosion bars, replanting and reseeded, reintroducing

native wildlife, riparian restoration projects, weed control, prescribed burning, and so on.

Nonetheless, for many of the larger chunks of semi-wild country, the primary needs are road obliteration and time. Nature heals. No, not to exact presettlement conditions, but close enough. Close enough for large carnivores. Close enough for most native species and processes to thrive again. Close enough for *wildness* to reassert itself. And close enough for humans to once again regain a little bit of soul, a little bit of the old life force that once differentiated us from the futuristic androids of bad science fiction come true in the feckless glare of today's microchip teevee tabloid media nightmare....

Ah, but there I go....So let's just say that science has taught us to describe the biological need for big interconnected wilds. Scientific arguments are powerful. To protect and restore native biodiversity is an increasingly popular calling. Yet science without the aura of mystery and magic fails to grab many potential allies and can bog us down in myopic microdebate. In the final analysis, with a nod to good science, effective wildland restoration must be as much art as science, more commitment than technique, and as much soul as research and data processing. For the true soul of all land is a wildness that in most places we shall never again know, a true wilderness of dynamic land and life far too complex for our clever but limited intellects to ever process.

If we have both the courage and the audacity to promote *wilderness* restoration first and foremost, we'll certainly travel a rough path fraught with obstacles. After all, real wilderness has always been a tough sell. That's primarily because despite considerable advances in conservation, in the context of three or four thousand years of civilization's momentum, wilderness remains a revolutionary concept. So it won't be easy to convince society that our greatest challenge for the next millennium will be to roll back the previous millennia's momentum in order to rewild some of this tiny living spinning speck of cosmic dust called Earth.

But profound goals are rarely easy to attain. And I can think of nothing more profound than the quest to reweave some of Earth's most basic living fabric, the fabric that once nurtured literally all known life, the fabric of life that we call wilderness. ◀

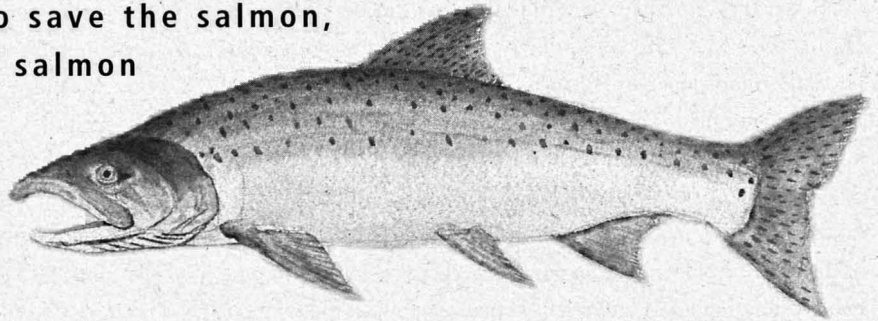
Long-time wilderness proponent Howie Wolke is the founder or cofounder of several conservation groups and the author of Wilderness On the Rocks and The Big Outside (the latter co-authored with Dave Foreman). In addition to conservation work, he runs a family wilderness guide service called Big Wild Adventures (5663 West Fork Rd., Darby, MT 59829).

Remembering Our Way Home

by Freeman House

**Ironically, as we work to save the salmon,
it may turn out that the salmon**

save us. —Paul Schell, mayor of Seattle



In one ancient language, the word *memory* derives from a word meaning mindful, in another from a word to describe a witness, in yet another it means, at root, to grieve. To witness mindfully is to grieve for what has been lost.

The memory of the salmon themselves remains a mystery that teases human rationality. Biologists like to locate salmon's capacity to remember in the olfactory organs: the fish identify their natal homes by the smell of the waters of their birthplace, we are told, separated out somehow from the infinitude of smells in the planet's oceans. Even as such sensory skill causes me to marvel, I suspect this is too reductionist a description. One has only to watch a school of young salmon moving as if impelled by a single common thought to know that there is something else going on, some mutual mindfulness that resides in the species. I grieve for a quality of mind that seems to have been lost in my own species' evolution.

But perhaps our skills of mutual perception and adaptive response are not lost, but only temporarily misplaced in the transient quality of contemporary civilization that philosopher Charlene Spretnak calls modernity. Spretnak describes modernity as a medium that surrounds us as water surrounds fishes, a medium that truncates our native ability to experience life as a multitude of shared memories, both those of our own kind and those of other orders, genera, and species.

When mindful witness becomes collective it gives rise to territory, a place to experience the Earth. As our individual mindful witness is turned purposefully outward, we are transformed; we become part of a piece of the planet's own memory. We find individualism, the holy grail of modernity, not diminished but grown into a mature interpenetration of individualities; we grow larger. Human memory is no longer an isolate experience; it becomes part of the place's own memory, the whole that promises relief from our unbearable isolation. We grieve when any part of that memory is erased—as it is when another species disappears from our common homes.

This essay is excerpted from Totem Salmon: Life Lessons from Another Species, Freeman House's lyrical new book that recounts the two-decade-long effort of the Mattole Watershed Salmon Support Group to restore native salmon to the Mattole River. Totem Salmon will be published in April by Beacon Press (25 Beacon St., Boston, MA 02108-2892; www.beacon.org).

THROUGH THE EARLY EIGHTIES, THE MATTOLE WATERSHED Salmon Support Group maintained its most daunting sustained effort as its members incubated coho salmon and reared them to yearling size for release into the creek. It was daunting because the water flow to rearing pools had to be maintained throughout several particularly fierce winters, when the high waters were laden with silt; at times, two-hour watches had been established around the clock to assure that the water intakes installed in the beds of feeder streams didn't clog. By 1986, a total of nearly 24,000 yearling fish had been released over a period of five years, but state biologists were doubtful that even these numbers were large enough to be significant. During the same period of time, local restoration workers guided California Conservation Corps crews in the modification of 14 logjams in the lower mile of the creek. Through these efforts and other projects, accessible spawning habitat was increased by 150 percent.

With winter monitoring efforts spread thin across the whole of the riverine watershed, no conclusive proof emerged that the coho restoration effort had resulted in a restabilized population. Some small part of the collective community psyche held its breath for 12 years through cycles of flood and drought.

Then, in the summer of 1998, more than a year after coho salmon had been listed as Threatened in northern California under the provisions of the Endangered Species Act, the National Marine Fisheries Service contracted a team of biologists to determine the presence or absence of coho in various tributaries of the Mattole. Guided by Salmon Group diver Maureen Roche, the team spent an hour snorkeling in Mill Creek and counted around fifty coho juveniles in three cold pools. The breath of the collective psyche has allowed itself a tentative exhalation.

No one will ever know if it was the introduction of juvenile fish into the creeks, or the restoration and maintenance of habitat, or the protection of the ancient forest, or a combination of the three that has resulted in the presence of coho here. No one much cares. Human hands have been applied in ways that resonate with the resilience of the recovery of the wild. I am compelled to tell this story, too, to my newer neighbors. If these stories are not kept alive in the collective memory, the salmon might be allowed to disappear once more.

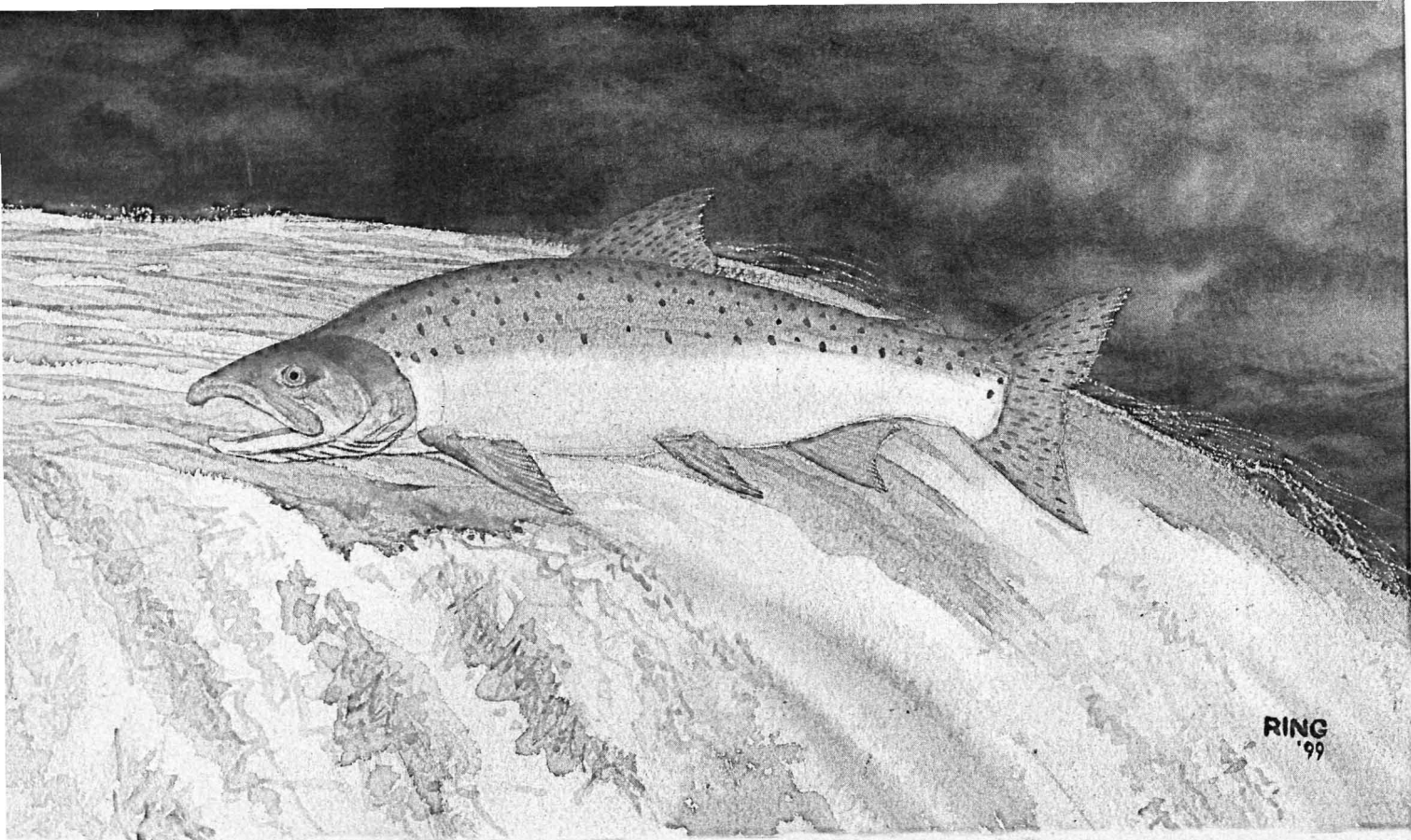
THE SALMON GROUP HAS MAINTAINED ITS PRIMARY program, the capture and incubation of native king salmon eggs, over 18 winter seasons. Nearly half a million young-of-the-year native salmon have been released back into the river. Egg-to-fry survival rate has remained high at an average of over 87%, an

eightfold increase over what could be expected in a river system so severely degraded.

As we know, the escapement counts decreased from an estimated three thousand in 1980 to a low of some two hundred in 1990-91. In the years since then, the comparative counts have grown in excruciatingly small—but steady—annual increments to an estimated one thousand in 1996-97. The numbers dipped only slightly in the face of the new El Niño winter of 1997-98. The steady dedication of the group throughout the difficult eighties in the face of such ripe opportunities for despair can only be explained by a passion born of love and place, and by the love of salmon carried by the growing numbers of watershed inhabitants who continue to swell the workforce available to the Salmon Group and the Restoration Council.

How satisfying and just it would be if the resident effort could credit its own survival as the determining factor in the seeming rebound of the stocks. But we cannot do so with any certainty. "It's too early to say," one worker will tell you, and this is true. "Too many variables," another will shrug when embarrassed by over-exuberant praise. This is also true. Meanwhile the Salmon Group repairs its tattered weir panels and worn holding tubes, tunes up its single one-ton truck, and readies its raingear for yet another venture into the cold winter waters.

THE VARIABLES COMBINE INTO AN UNSOLVABLE EQUATION, each element of which provides more questions than answers. The indications of recovery have occurred during a period of usually stable weather patterns, which have included at least two seasons of optimal flow conditions in the Mattole River during the salmon's upstream migration. Little-understood cycles of ocean nutrient abundance and a commercial fishery regulated almost out of existence further complicate the equation. Projects in habitat rehabilitation and successes in creating protected refugia have certainly improved the outlook for the natural reproductive success of salmon, but there remains no way to calculate the combined contribution of our human efforts. Small increments of improvement in land-use practices must be intuited rather than quantified. And in a climate of diminishing timber resources, the corporate owners of the headwaters of important tributaries become increasingly aloof to efforts to mount community standards of self-regulation. As the era of the nation-state draws to a close, they have become, in fact, more aggressive. Should they succeed in their insistence on clearcutting unstable slopes to within yards of the streams that are the mothers of waters, the resultant landslides could destroy all our collective efforts in a single winter.



The Salmon Group has set as its goal the consistent presence of 2000 pairs of king salmon spawners in the river each year, and 2500 pairs of coho. Should these goals be reached, then—perhaps—the fishers will allow themselves the pleasures of an occasional salmon feast in warm, dry winter homes. In my admittedly biased opinion, if it weren't for the enduring effort of the Salmon Group, there is every likelihood that these native stocks of salmon would have been lost forever.

I WANT TO SEE THE RIVER. IT IS LATE SUMMER AND THE flows are as low as they will get this year. I walk down and dip in my hand to test the temperature. The water is cold, cold enough to sustain the darting flashes I know are juvenile salmon. The waterway is enclosed in an embrace of exuberant vegetation; everywhere the light is dappled and the air filled with the sweetness of ozone where the river crashes over bedrock extrusions. Where the water slows to flow over long reaches of gravel it is so clear as to seem invisible. Fifteen years ago, when I walked this same reach a kick of my rubber boot would dislodge enough silt to obscure the bottom. Today I reach down and collect a handful of small cobbles of just the size preferred by king salmon for burying their eggs. When I drop the rocks back into the river, fine sediments are washed away as individual particles that glint and sparkle where light hits the water.

I walk by the river for half an hour. I pass a few of the streambank stabilization structures built of native stone by

Richard Gienger and his crews more than fifteen years ago, so carefully placed that nearly all of them have survived several flood winters in their original configuration. Wet mosses thrive on the rocks; salmonberry and five-fingered ferns grow from the interstices that have captured the soils carried by flood waters. The structures appear to be at the same time natural parts of the living stream and expressions of human culture as evocative as the stones of ancient cathedrals.

I WALK IN A WORLD I HAVE COME TO UNDERSTAND AS mutable, ever-changing. My walk on the next morning carries me into streaming fog blowing off the Pacific into my face. The chill of it shortens my planned route and makes me wonder just how wide that line on the map that divides water from land should be.

The rolling hills around me seem still, but I know that they are not. All the land within my view is called by geologists an accretionary prism. In plainer language, the seemingly solid ground under my feet is made of rubble scraped off the Pacific plate as it dives beneath the North American plate. Such knowledge is occasionally enlivened by an adrenal rush that is a response to the rumble and roll of the earth, or by a series of sharp jolts that knocks the jars off the shelves in my home. It is the mountains around me rearranging themselves.

After a while, the movement of mountains rearranges the mind. I find in myself a new fluidity of response, a diminished sense of attachment, a more comfortable sense of humility. I am

a different person than I was when I arrived in this valley. I may not be alone.

I have taken this same walk repeatedly for nearly twenty years. In one place along the way I can see the flow of the river 600 feet below. When I first came here, the river flowed on the far side of the floodplain; now it eats at the bank closest to my feet. It will move again. Young trees emerging from impenetrable brush have now grown large enough to shade the viney brambles and poison oak. I have removed some of the lower limbs to reduce fire danger and to encourage the trees to grow straighter. Now a part of my walk takes me through their shade. I am beginning to become conversant with the landscape and the conversation is reciprocal.

It is early autumn now. Soon the salmon will arrive to mill offshore, to feast and be feasted upon as they wait for the berm that blocks their access to the river to be broken by the first rains. There is a bluff overlooking the confluence of the river with the sea. When the berm breaks, I will go up there and watch the murky brown waters of the river pour into the sea. I will know that there are salmon beating upstream against the current, though I won't be able to see them. If this year is like the last few years, there will be other people there. They will come and go all day. No formelist will have called them there. Some will chatter excitedly, comparing the placement of this year's opening of the bar with last year's or speculating about the relative ferocity of the coming winter. Others will stand or sit quietly for a while and then go back to whatever tasks the coming of winter requires; I won't know what is passing through their minds.

For my part, I will be thinking about what salmon are trying to teach us. That there is a way for us humans to be, just as there is a way for salmon to be. That we are related by virtue of the places to which we choose to return.

Claude Levi-Strauss has observed, "In a world where diversity exceeds our mental capacity nothing is impossible in our capacity to become human." If this claim is true, then the obverse corollary it presumes must also be true—that if natural diversity becomes simplified to the point that we can realize the deluded modern ambition of "managing" it from a distance, our capacities to become human will also be severely diminished. As we engage directly the recovery of our shared habitats, we find ourselves in the embrace of the expansive community that offers the best hope of realizing ourselves as fully human. There is no separate life. ☾

Former commercial fisherman Freeman House is a cofounder of the Mattole Watershed Salmon Support Group and the Mattole River Restoration Council. He lives in Petrolia, California.

Sockeye Salmon

Onchorhynchus nerka

Salmon hatch strong, perceiving pain
from the start—the weight of water,
air penetrating the skin of nerves.
Without eyelids they do not sleep
but float to the ocean, listless, growing
old slowly, scales seasoned with rings.

They return to spawn. No one knows
how they find the mouth of that river:
ascending the stairs of perseverance,
smelling the streams they were born in,
fighting rapids, leaping the waterfall.

Exhausted, they spill upon the riverbank,
smashing their skulls on rocks
and dying or, stunned, struggling
back to water again, leaping again,
out of their element, bruised
bodies turned into wheels.

—Barbara Helfgott Hyett

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The River Knows The Way

by Katie Lee



When my old friend, Ed Abbey—who now lies, smiling, in his rocky desert outcrop—wrote *The Monkey Wrench Gang*, he gave those of us who knew Glen Canyon a respite from our bitterness over its demise by providing us with a vivid fantasy: the dream of a wild river flowing once again around the crumbled hulk of the most hated blob of cement and steel ever constructed.

The Glen Canyon Dam.

We laughed with him, and cried, and imagined. Wouldn't it be great if...and dreamed on...Hayduke Lives!...because it was pure fantasy.

This article, and sidebar by Terry Tempest Williams, are adapted from Katie Lee's recent book All My Rivers Are Gone and are reprinted with permission of Johnson Books (Boulder, CO).

Katie Lee: Voice of Glen Canyon

by Terry Tempest Williams

Katie Lee has given us an elegiac song of Glen Canyon. Bless her. Bless her for holding on to this story for almost four decades. Bless her for not forgetting. Bless her for remembering. Bless her for loving the river. Bless her for her anger when the river was dammed. Bless her for choosing to release her memories of “The Place No One Knew” now as we begin to imagine in very real terms the day when the Glen Canyon Dam will be dismantled.

What Katie Lee knows she knows in her body—through her hands that rowed the oars, through her feet that walked the canyons, through her heart that still carries the heat of those days in Glen Canyon. In so many ways, this is a woman who embodies the power and tenacious beauty of the Colorado Plateau. Her spitfire intelligence and redrock resolve provides us with an individual conscience that we would do well to adopt.

Katie Lee is a joyful raconteur, a woman with grit, grace, and humor. She is not afraid to laugh and tease, cajole, and flirt, cuss, rant, howl, sing, and cry. Katie Lee is the desert’s lover, her voice is a torch in the wilderness.

When I finally met Katie she exceeded my expectations. Her presence was electric. She was wearing a tiger-print (or was it leopard) sarong with a black leotard. Her clear eyes flashed mischief and her tanned skin bore the cachet of a woman who has spent more time outside than in. Within minutes, her ribald humor turned to a deep tenderness. Her eyes teared, “Did you ever know the canyon?”

Katie Lee caught me off guard. “Did you ever see Glen Canyon?” she asked again.

I paused.

“Yes, but not like you. I saw it through the eyes of a child, an adolescent who saw going to Lake Powell as a chance to waterski in the desert—until it started to rise.”

In that moment, my own memories of Glen Canyon began to surface. The year was 1965. The dam was completed two years earlier with the “dead water rising” on January 21, 1963. The slow drowning of Glen Canyon had already begun so I never knew it as a canyon with a free-flowing river down its center. I knew it as an expanding Lake Powell that seemed to swallow up sidecanyons almost as we watched. Every day, the water would rise. We would have to keep moving our camps further back from the water’s edge. What I remember as a child sitting on the fiberglass roof of our motorboat were the towering redrock walls, the slit of blue sky, the cavernous alcoves that we would seek for shade, the power of our echoes as we would play with sound as it ricocheted off stone. I recall the fern grottos where we would walk in the morning heat for spring water and fill our bottles for day hikes, the pictographs that inevitably would be staring down at us. We realized early on, we were not the first ones here. And every subsequent year, the places we were coming to love, were no longer there. Drowned. I learned on a visceral level, beauty is not something to be taken for granted.

continues



Katie and Frank Wright at Navajo Creek (mile 95.6), 1956. Photo by Tad Nichols.

Much of the American public, in 1975, didn't even know what such dams were for, and those who might have had an inkling didn't know where they were, or what they did. So Ed's novel, at least, put that damn chunk of cement on the map.

It also put me back onto what little remained of some of my rivers that were gone; rivers I had completely abandoned ten years before.

I have never returned to Wreck-the-nation Reservoir, nor to the truncated Grand Canyon, and I pretty much gave up on the human race after watching the bureaucrats trash a wonder of the world, then heaping further insult by naming their sump after Major Powell—a man who *did* know about sane distribution of water in the arid West.

Then I thought...Hey, I have a compact *of my very own*, made on a personal level, having nothing to do with those people, with politics, with greed or manipulation. I have a compact with the Colorado River and its canyons. Furthermore, I hadn't made it on any goddamned piece of paper and sent it up for approval past a row of upright, uptight know-nothings, some of whom had never seen or heard of a place called Glen Canyon.

The compact asked that I not forget the river-that-was; that I go to canyons that drained into the once-and-future Glen and find whatever solace they might offer, thus easing the pain of the big canyon's loss. I saw how quickly wild places and rivers were being exterminated, so I packed my backpack and went searching.

What I found at least sustained me.

Now, we are nearly a quarter-century past that time, with more than twenty-five times that many rivers and secret places gone. Yet, let me urge you (no matter the odds) to seek out such a place. Why? Because you *need it*, whether you know it or not. If and when you find it, tell no one else where it is. Keep it as long as possible and, like a loved one, cherish it, being aware that love is also pain, discovery, joy unrealized and—sooner or later—loss.

SEPTEMBER 1997

This morning, as I was about to experience one of my bad days—a day when my photograph of Forgotten Canyon blurred and I couldn't get beyond the old cottonwood tree to wander up that beautiful stream—the phone rang.

A young man named Richard Ingebretsen asked me if I would please come to a meeting of the Glen Canyon Institute in Salt Lake City and sing for them.

What institute? Glen Canyon? Why have I never heard of such an organization? Glen Canyon had been forgotten by all but a handful of souls like me. Could there be some kind of light at the end of the tunnel after forty years!

I went.

Never, in my wildest dreams, did I envision an auditorium of twelve hundred university students on their feet with cheers, whistles, and clapping hands after I sang a couple of my river songs! We're talking here about a fifty-year generation gap. How was that possible?

Because they wanted something back that was ripped off before they had a chance to see and enjoy it? Because we have a different political climate now? Yes. But mostly because the younger generation has something going for it that could not have happened in my Glen Canyon years. There is now a *conscious awareness* that the huge political mistakes and gross miscalculation made more than forty years ago can be corrected, and that such boondoggles that are still proposed can more often be put to rest.

Had anyone told me that I'd be sitting on a stage with even an ex-commissioner of the Bureau of Reclamation, who was urging the audience to rethink dams and what they do, I'd have called them soft in the head. Yet, Daniel P. Beard, now of the National Audubon Society, was saying:

The decision to build any dam isn't a scientific decision, an economic one, or a pronouncement from God. It is—pure and simple—a political decision....The suggestion that we drain Lake Powell, and restore Glen Canyon, is breathtaking in its scope. The political and economic obstacles would be substantial, but I'm not prepared to dismiss the idea. We already spend millions of dollars each year to maintain the Grand Canyon's river ecosystem. Millions are also spent to protect and restore endangered fish and correct other environmental problems caused by the dam. Why not consider spending those millions on restoring the canyon?
[October 1997]

Other speakers on that stage were scientist Dave Wegner (another former employee of the Wreck-the-nation Bureau, who was basically responsible for the thirteen-year Environmental Studies Program in Grand Canyon); Richard Ingebretsen, president of the Glen Canyon Institute; and David Brower, who serves on the institute's board of trustees. Brower is putting time and effort toward righting a wrong he claims is mostly his because he didn't act quickly enough in 1956, or know enough about the Glen, to help us save it. I doubt that he could have, but it certainly got him, Martin Litton, and the Sierra Club centered against dams in Grand Canyon. The public, truthfully informed at last, stood up and said "NO!"

I didn't know the particulars, certainly not the politics. I was a child being taken on vacation by my parents. I overheard conversations. My father and his buddy, Gordon James, knew Glen Canyon, they had explored it through the years. They would tell us stories. They took us to Cathedral in the Desert and Davis Gulch. They told us to remember these places because they would be gone the next time we came to Lake Powell. They told the truth. I remember even then, harboring a sadness for the slickrock that seemed to have no rights.

In 1970 our family returned to Lake Powell, as we always did on Memorial Day, with neighbors. The water was high and still rising. We had been on the lake for several days. One afternoon, my father asked me if I wanted to waterski to the next camp. It would be a long ski and did I think I could do it. I said, "of course," and jumped into the water as my mother handed me a slalom ski over the side of the boat. I put my right foot into the rubber slip and my left foot into the back one and steadied myself with my arms. When the ski rope was thrown, I grabbed on to the handles and waited for the slack to run out as the boat straightened itself.

"Hit it!" I yelled.

My father put the throttle at full board. I was up in a flash skiing on water that appeared as glass. Pure exhilaration. I skied behind the boat, crossed the wake, picked up speed alongside the boat, then pulled back behind the boat again, coasting. It was a gorgeous day. We had been motor-ing along around fifteen minutes when all of the sudden I heard a terrible thump and then saw the boat jump up off the water and turn on its side, then bounce back center. The boat stopped. I slowly slipped back into the water as I watched our boat sink.

My mother and three brothers climbed on to the roof of the boat as my father tried to bale out the incoming water with a bucket. I began pulling myself in with the rope. Within a few minutes, our friends came back to find us; we all got inside as they hitched our sinking boat to theirs and then sped to the nearest marina which was several hours away. Our boat kept upright as long as speed was maintained, but once we got into the Wahweep Marina and had to slow down to five miles per hour, our boat sank for good.

Our boat had hit a newly drowned redrock spire.

That night in a motel in Page, Arizona, I wondered how many motor boats, engines, stoves, coolers, cups, shoes, even bodies, must be at the bottom of Glen Canyon. It all felt so wrong—the truth of this magical place underwater.

I have never been back.

continues

Yes, the climate has changed, and the public will begin to say NO! much more often.

From a workshop paper distributed by International Rivers Network, Berkeley, California:

Some of the most extensive work on decommissioning to date has been in the US, growing out of successful fights such as the Edwards dam in Maine, and the Elwha River dams in Washington. Active campaigns are now under way to demolish four dams on the Snake River, and Savage Rapids Dam in Oregon, and drain the Powell Reservoir on the Colorado River to restore Glen Canyon. In 1998, demolition started on the nation's first federal project—the culmination of the Oregon Natural Resources Council's campaign to remove the Elk Creek Dam. These campaigns have capitalized on the experience US environmental groups gained fighting destructive dam projects over the last 30 years.

Here, the word is out that rivers need to run, to keep us and our planet healthy. Tear the dam down? No. That's expensive and unnecessary. Time, and the river flowing, will take it away. Floyd Dominy wants it left there as his monument. So do I—a monument to his and the bureau's arrogance and stupidity.

The Glen Canyon Institute's mission is to provide leadership in reestablishing the free-flowing Colorado River through a restored Glen Canyon.

Restored.

Not by monkey wrenching, but by the best science available and the safest method of draining reservoir Powell...and in so doing, slowly returning a sick and sorry Grand Canyon corridor to its natural state, with beaches and habitat, as it was before Glen Canyon dam.

Or, do we...

Leave it for Mother Nature to wipe out the entire system in days, not years, with a domino effect? This she will do...almost did, in 1983. It has been noted that she's going through menopause—hot flashes, cold sweats. That, plus being terribly pissed with human negligence, will likely put her over the edge one day soon. A few more El Niño's and that dam is GONE. As Barry Lopez, writer-poet-visionary, wrote, "You can feel the anger in water behind a dam."

There is much more than anger in reservoir Powell. It should be looked at for what it truly is—a two-hundred-mile toxic waste dump. Dangerous to your health. What lies rotting and bubbling in its bottom would boggle the mind—motors, boat hulls, batteries, bones, pesticides, toxic silts—to say nothing of

what lies on and near the top—human piss and feces, and several million gallons of petroleum dumped unburned into the water every year by recreational boats and jet skis.

WHAT ENTHRALLS ME ABOUT MOTHER EARTH IS HER disrespect for what humans consider their greatest achievements: skyscrapers, bridges, dams, etc. With a small adjustment of her girdle, they all come tumbling down, and sometimes she just wrings out her laundry.

Recently I saw a slide show of what happened in a very short time on the Escalante River—a main tributary off Glen Canyon, and identical to the Glen's geology. In 1983 the rez overflowed and flooded the Escalante way up past Coyote Gulch. During a decade of drought, it dropped as low as ninety feet. In the Escalante it left a twenty-foot bathtub ring and ten-foot mudflats—dried, cracked, and solid. In 1993 storms cut clear through the mudflats, washing the whole rotten mess back down into the rez. The ring was almost totally obliterated, springs and seeps returned, and native vegetation began to grow, with vengeance, along the original streambed. Sediment transport starts immediately upon reservoir drop.

Bill Wolverton's documentary slides spoke volumes to me.

Several years ago, hiking up a winding crevasse off White Canyon, we were stopped cold after five miles at an impassable pourover, an enlarged area with hollowed dome—maybe half the size of Cathedral in the Desert—the drop into a pool through corkscrewed sandstone, perhaps twenty feet. It was one of those places where you backtrack, find a route up, out, around, and finally back into the streambed. A few years later, one of our party returned to that canyon, rappelled in about a mile above the place we were stopped, and hiked it all the way to White Canyon with no rope, encountering no large pouroffs or drops. The hollow had been filled with sand and gravel (from Woodenshoe Mountain) by a slow, three-day spring rain. By now, it has probably been flushed out again with heavy storms. Such is the nature of the Colorado Plateau...and of Glen Canyon.

A drained reservoir will make Future Glen Canyon temporarily ugly, that's true, but not for as long as you may think; and with a flowing river there will be more and cleaner water for use, because the reservoir evaporates and seeps far more than it saves.

Our Grand Canyon river corridor is also in a sorry, unnatural state. Icy cold, clear water released from beneath the dam has killed most of the native fish, and the once-upon-a-time-



"The Wave" (Colorado River) by Serena Supplee

I think about Katie Lee and the last song she sang in Music Temple on October 15, 1962, her last trip on "The Glen." It was a spiritual she had learned called, "They Crucified My Lord." She changed the words:

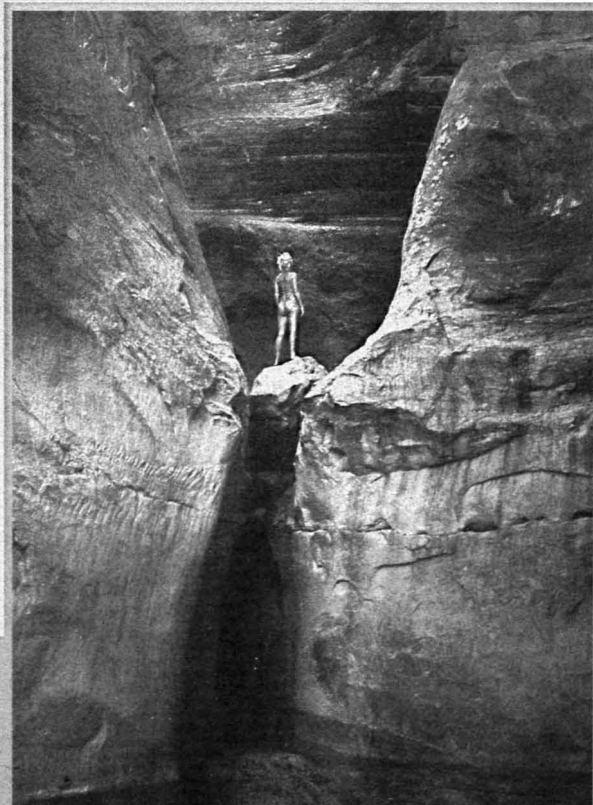
*They crucified my River
And he never said a mumblin' word—
They pierced him in the side
But he never said a mumblin' word...
not a mumblin' word—*

*And the blood came trink-lin' down,
Still, he never said a mumblin' word...
He just hung his head, and he died
But he never said a mumblin' word...*

*Now wasn't that a pity and a shame—
The way they done my River?
Not a word...not a word...not a word.*

The next morning, when I sat on the beach alone staring out over Lake Powell, while my parents were making arrangements for us to get home, something shifted in me. I didn't want to talk to anyone. I just wanted to listen. Who knows—maybe somewhere on the wind, Katie Lee's song was still being carried throughout the canyons.

Her voice has finally reached us in its most vibrant form. *All My Rivers* may in the end be written from the future. If Glen Canyon is to breathe once again, which I believe it will, we can thank Katie Lee for reminding us what once lived, what was then destroyed, and can now be resurrected. ☪



"The Pagan," Cattails Canyon (mile 54.3), 1957. Marty Koehler photo, courtesy of Katie Lee.

mile-long, sandy beaches ringed with driftwood, no longer exist. They all lie immersed behind the dam, gathering toxins. Once those sands and silts were full of nutrients gathered from the lush flora and fauna in the Glen; a rolling river carried them down the Grand, where they nourished both aquatic and stream-side life all through the canyon.

The return of a free-flowing Colorado River is not a matter of IF...only WHEN.

I would give the Future Glen a new identity...a new status, as yet unnamed. It was unlike any other place on Earth and should be treated as such—as a haven, a refuge, an ivory tower, a sanctuary—the heart of the Colorado Plateau should be allowed to beat again. Glen Canyon should have *commercial and political* asylum; it should be a place where no engines or motors whine, where only the sounds of the canyon, the river, and the dipping of oars are heard. And when it arrives once again to the light of day, you fighters out there...you activists...apply constant vigilance. Respect the bones of ages past. Honor the River God. Don't let anyone or anything trash the magic of that very special place.

WHEREVER I AM AT DAY'S END...WATCHING A SUNSET...AT peace...hearing the Canyon Wren's goodnight—I thank no man-invented god for my great good fortune. I thank the Earth-

Mother for allowing me aboard her spaceship—and for the River of Life that takes me through. And I claim full responsibility for the rapids I've run, or not; the eddies I've used, or not; the River God's advice I've taken, or not; and whatever strength I've had, to get around the boulders, over the sandbars and through the narrows, in that Great River. No fault but mine, if the current, ever present, did not bring me through.

The River knows the way. ☪

In her 40-year career in the entertainment industry, Katie Lee has been an author, musicologist, folk singer, storyteller, Hollywood actress, songwriter, filmmaker, photographer, poet, activist, and river runner. Her book All My Rivers Are Gone was published by Johnson Books in 1998. Autographed books and Katie's CDs and cassettes are available from Katydid Books and Music (POB 395, Jerome, AZ 86331).



Bison (*Bison latifrons*)

Rewilding for Evolution

by Connie Barlow

"Wilderness," as Dave Foreman has said, "is the arena of **evolution.**" Saving it, and making space for the wildlife with which we share this continent, is a prospect that transcends the ephemeral.

—Tom Butler, summer 1998 **WE**, p. 9

Let me add here that, as brilliant and visionary as Soulé, Noss, and I may be, we are not coming up with something new under the sun. Listen: ... "Only those able to see the pageant of **evolution** can be expected to value its theater, the wilderness, or its outstanding achievement, the grizzly." These words are fifty years old, they are part of the canon of the "received wilderness idea," and they are exactly what The Wildlands Project is about today: Ecosystem representation. Cores. Corridors. Carnivores. Aldo Leopold wrote them. —Dave Foreman, fall 1998 **WE**, p. 3

I am convinced that we cannot hope to protect native biodiversity and restore landscape **evolutionary processes** as long as the West is managed primarily as a feedlot for domestic animals.

—George Wuerthner, fall 1998 **WE**, p. 68

I can still cherish the thought of large, unmanipulated wilderness on this continent where the processes of **evolution** can go on more or less as they have for millennia...where evolution can continue on its own terms. —Donald Worster, fall 1997 **WE**, pp. 12, 13

As this series of quotations demonstrates, the evolutionary value of wilderness is widely recognized in the pages of *Wild Earth*. Within the past two years, at least four contributors have made this point, and one (Foreman) traced the lineage of the idea back to Aldo Leopold. Nevertheless, wide recognition is not the same as depth of treatment. The evolutionary value of wilderness has been, rather, a turnip tossed into the pot. A bit of turnip adds a nice bite to a soup; but who wants to make turnip soup?

I do.

I believe the evolutionary value of wilderness could become one of the strongest arguments in its favor. Evolutionary value would thus join biodiversity preservation and ecological self-regulation as supports for rewilding.

Why rewilding? Why should vast expanses of self-willed terrain be protected and recovered? An evolutionary perspective provides this answer: *Rewilding must be undertaken because, next to outright species extinctions, the most abhorrent outcome—the greatest crime against creation—humanity might effect would be for surviving lineages to skew their future evolution substantially in response to us.*

Arthropods and vertebrates, angiosperms and bryophytes—all these and more, right now, and whether or not we so intend, are building and shedding genes to cope with our highways, our pesticides, our herbicides, our waste dumps.

Lineage upon lineage is shaping fitness—however

subtly—to survive in a world in which the human presence is pervasive. Even well-intentioned and scientifically based management decisions in the most excellent of biodiversity reserves designed to preserve this planet's evolutionary *heritage* are an inescapable manifestation of humanity's unchecked reach into evolutionary *futures*.

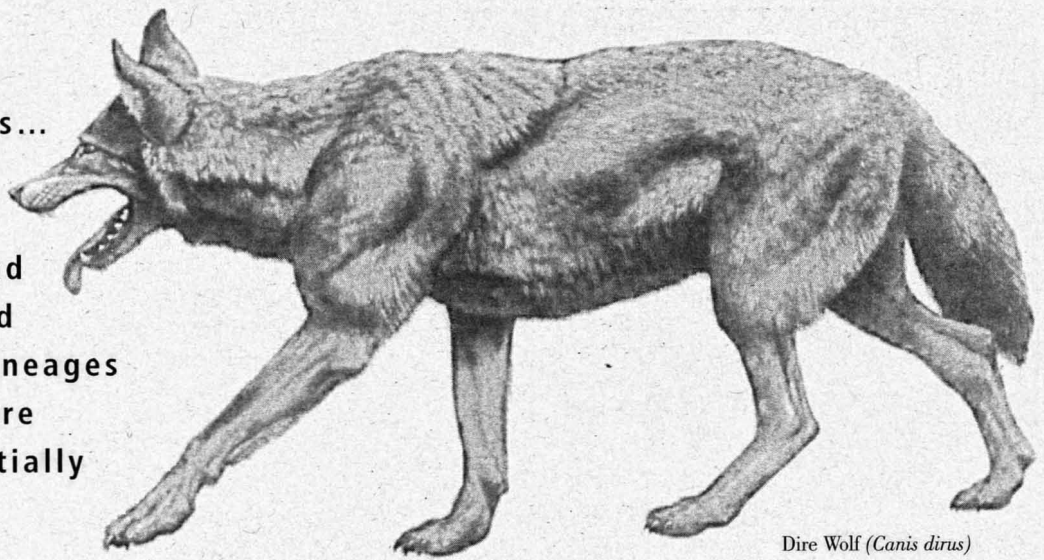
Sadly, the human impact on evolutionary futures is substantial even in the wildest areas under federal land management today. Designated Wilderness Areas in many parts of the United States are open to livestock grazing. And even where large carnivores do not face the challenge of figuring out that the easiest four-legged creatures to catch (domestic sheep and cattle) are not, in fact, on the menu, they have to cope with contradictory signals from two-legged creatures who trespass into their territories. Backpackers should be easy to hunt; nevertheless, if a large carnivore experiments in this direction, the innovator will be tracked down and killed. Intermittent exposure to the magical powers of humans to kill or wound at a distance does seem to preclude that kind of experimentation in the wilderness region I am most familiar with—the Gila Wilderness in southwestern New Mexico. There bears and lions are hunted for sport. In this, the first of all designated Wilderness Areas, the evolutionary futures of wild beasts are thus profoundly influenced by human demands for meat and recreation.

Accordingly, philosopher Baird Callicott has contended that if conservationists begin to speak of the evolutionary value of rewilding when we push for a remnant of America to be held off-limits to the impacts of settlement, logging, and mining, then for consistency's sake we ought to go the full route and urge the elimination of grazing, hunting, and what he calls "wilderness voyeurism and tourism" too. Rewilding for evolution, in its purest form, would thus challenge common assumptions about compatible human uses of Wilderness. At the very least, such discussion would make arguments for rewilding based on biodiversity preservation and ecological integrity appear modest indeed. At its best, this kind of discussion would serve to remind us all that whatever each of us may feel about the propriety of intentional genetic manipulation conducted in laboratories, such pales next to the reality of the evolutionary consequences that our species is forcing upon life everywhere outside the scientist's lab.



American Lion (*Panthera leo atrox*)

Next to outright species extinctions... the greatest crime against creation humankind might effect would be for surviving lineages to skew their future evolution substantially in response to us.



Dire Wolf (*Canis dirus*)

Conservationists need not argue that human hegemony over the future evolution of life on Earth is somehow unnatural. The most natural thing for any form of life to do is to pursue its biotic potential: to reproduce as fast as it can and to invade any habitat in which a toehold can be gained. Nevertheless, because today's biological holocaust owes to a single species, we can argue that such hegemony is unprecedented in the history of life. Indeed, this sixth major mass extinction may be the first time that life of any sort is to blame for deep cutbacks in biodiversity across the globe. Previous mass extinctions may all have been caused by volcanoes or meteors.

Natural or no, unprecedented or no, we shudder at the thought of human hegemony over future evolution. We shudder because we know in our souls that this behavior is not right. This is not the way we wish to be human. This is not our ideal for participation in the Earth Community.

TO ACKNOWLEDGE THE EVOLUTIONARY VALUE OF WILDERNESS would thus be both a strength and a burden for the rewilding movement. Evolutionary valuation of wilderness carries a strong ethical, even religious, appeal, but it questions the wisdom of allowing traditional human uses of wilderness to continue in the deepest cores of our wildest landscapes. It would also complicate "management" decisions. Consider: in rewilding a landscape that has already lost a great proportion of its endemic richness, should reintroductions be attempted? If an endemic subspecies is now extinct, should another subspecies be introduced—both as a substitute for the *heritage* of richness lost and as a chance for endemism to once again work its way into evolution's *future*? Similarly, if a keystone species is extinct, should an ecological proxy—perhaps from another continent and of another genus—be introduced?

As students of evolution, we know that much of the wildlife

in North America derived from stocks that not long ago, geologically speaking, were alien invaders. Porcupines and possums originated in South America, but they waddled across the newly formed Isthmus of Panama some three million years ago and have long since earned their ecological citizenship in the North. Grizzlies and elk crossed over from Asia near the end of the Ice Age. (As did humans.)

Paul Martin, Pleistocene ecologist and early proponent of the Overkill theory of end-Pleistocene extinctions, encourages us to adopt a broader time perspective in our vision for rewilding. To Martin's way of thinking, a goal to restore a representative and sizable chunk of North America to the "pre-Columbian" conditions that prevailed 500 years ago is shortsighted. Rather, we should be aiming to restore conditions toward as much of America's *pre-Holocene* richness as humanly possible. That pre-Holocene richness was marked by the magnificent megafauna of the late Pleistocene.

In an article in this issue of *WE*, Martin and coauthor David Burney remind us that our modern extinction crisis was underway well before humans figured out how to plow the prairie. North America lost its mammoths, mastodons, giant ground sloths, glyptodonts, horses, camels, shrub oxen, and a number of species of the genus *Bison* eleven or twelve thousand years ago. The extinction of most of this continent's great Pleistocene herbivores was attended by the loss of many of their coevolved carnivores and large scavengers, too: the dire wolf, sabertooth cat, giant short-faced bear, American cheetah, and American lion. All this happened a geological blink of the eye ago. Should we perhaps aim to rewild toward end-Pleistocene standards? Is it even possible?

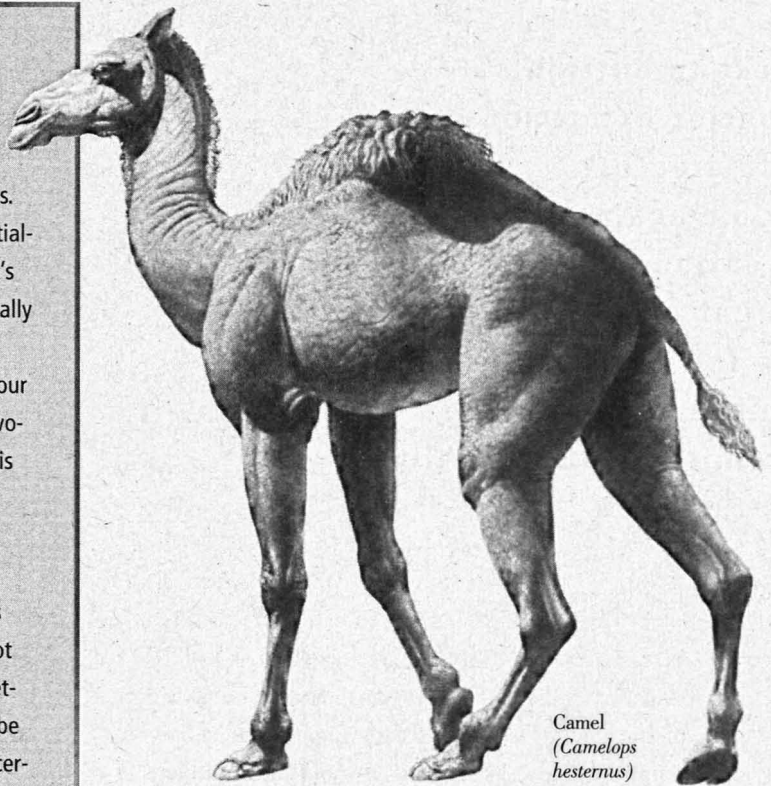
Proxies for some of these beasts (notably, elephants for mammoths) *do* remain elsewhere in the world. Should we, as Martin and Burney urge, bring back the elephants?

Dave Foreman What happens sometimes is we get the notion that wilderness is just this outdoor gymnasium, this yuppie backpacking park. It's not that at all. It's really a reservoir of wildness. Wildness is something that permeates all life. It's essentially the evolutionary force. It's the process of evolution. It's the flow of life. And that is what conservationists are really trying to save. It's not a matter of preserving scenery or backpacking parks. It's not even a matter of improving our quality of life. It's a matter of allowing the process of evolution to continue to flow on, to continue to produce this incredible diversity of species, this beautiful planet.

Edward Abbey We've got to share this planet with the other living creatures. Sharing means not merely preserving them in zoos or National Parks but setting aside huge areas, whole regions perhaps, that will be free of human interferences. Ideally I would like to see certain large areas of the planet set off-limits to human entry of any kind, even aerial overflights. Let evolution proceed undisturbed even by human observation in certain places at least. See what surprises it comes up with.

Mammoths, mastodons, and the smaller gomphotheres were prominent (and the authors argue, keystone) members of the Pleistocene menagerie on this continent. Coming from Old World lineages, the forebears of all these creatures were at one time alien invaders in this part of the world. But evolution got to work and brought forth the endemics. If we ourselves do not bring elephants back and offer them a second chance for an evolving, deepening citizenship, then Order Proboscidea will never again produce American endemics; the evolution of Order Proboscidea in the New World will be over.

Paul Martin and David Burney's proposal thus opens up a packrat's nest of questions, delving into ecological ethics as well as ecological science. Here I wish only to encourage that the evolutionary implications also be brought to the table. We should consider, too, that a back-to-the-Pleistocene standard for rewilding, at least in one test area, would help transcend the current controversy over how extensively American Indian cultures manipulated the landscape. Because humans were not part of American ecosystems until just before the great mammals went extinct, there should be no question that wilderness areas that emulate the late Pleistocene should be places where humankind "is a visitor who does not remain." The indigenous-management argument simply does not arise in this context.



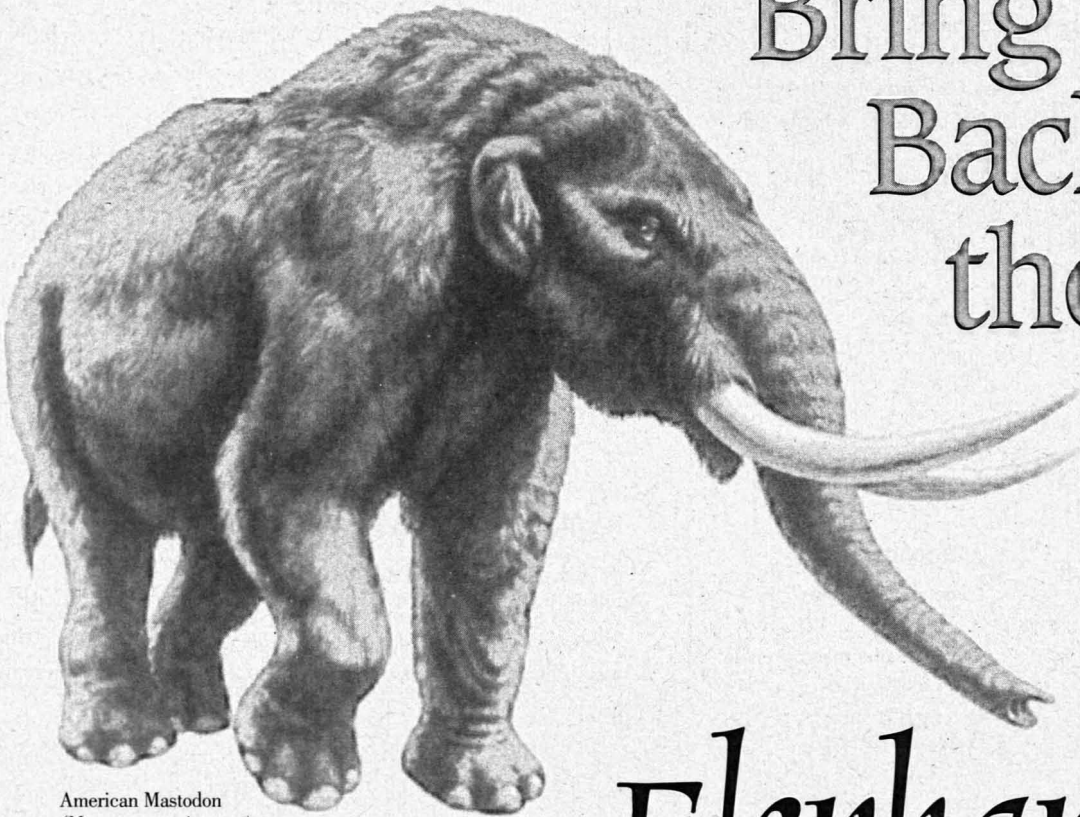
Camel
(*Camelops
hesternus*)

Another imperative to bring back the elephant and to offer this lineage "untrammled" wilderness derives from the strong scientific evidence that we humans are centrally implicated in its loss. According to the Overkill theory, before the first humans became fully native to this continent, we overhunted the great, naive beasts that had evolved no behavioral defenses against our projectiles. It can thus be argued that we are ethically obliged to do whatever we can to begin to right that wrong, our once and continuing crime against creation.

WHY, THEN, WILDERNESS? BECAUSE WILDERNESS IS THE arena of evolution—especially for the megafauna. Large herbivores and carnivores cannot be expected to survive, much less evolve, in tame little woodlots, no matter how pure the waters and how sweet the air. Great beasts will not emerge from the furrows of farmlands, no matter how organic and sustainable the agricultural practices. The human imprint on future evolution will be felt, too, wherever landscapes are intensively managed, no matter how scientifically informed and ethically enlightened the managers. For the Cenozoic Era, the Age of Mammals, to continue its tens of millions of years of stunning experimentation in large, hot-blooded beasts, Earth needs wilderness. ◀

Connie Barlow (cbtanager@aol.com) is a founding member of the Epic of Evolution Society and author of Green Space, Green Time: The Way of Science (Copernicus, 1997) and a book-in-progress, The Ghosts of Evolution, to be published by Basic Books.

Bring Back the



American Mastodon
(*Mammut americanum*)

Elephants!

Extinction of large continental vertebrates at the end of the Pleistocene (late Quaternary) has long been apparent to paleontologists (Martin and Wright 1967). Recently the consequences of this phenomenon have attracted the attention of conservationists and visionaries. "This land is the mastodon's land; while *Home on the Range* commemorates buffalo, deer, and pronghorn it misses the mammoths, glyptodonts, and camels. There was a wild America considerably wilder than any brought to us on TV. Our late Pleistocene legacy means we can imagine more, not fewer, *kinds* of large animals on public lands" (Martin 1992).

A decade ago, Michael Soulé predicted that "the reintroduction of these large animals will be controversial, but I would not be surprised to read someday that cheetahs are helping to control deer and that mesquite is being 'overbrowsed' by rhinoceroses." Soulé's presidential address at the third annual meeting of the Society for Conservation Biology was intended to prod conservationists to peer into the future of their discipline, and to acknowledge that such taxa as lions, camels, elephants, horses, and spectacled bears once native to North America disappeared relatively recently (Soulé 1990, Owen-Smith 1989).

by Paul S. Martin
and David A. Burney

Table 1. Extinct and living species of large (>45 kg) land mammals of the late Quaternary inhabiting the western United States and northern Mexico, arranged by order and family (after Martin and Szuter 1999). An asterisk (*) indicates extinct species, including five species of the Order Proboscidea (elephants and their allies). The more common species have terminal radiocarbon dates of around 13,000 calendar years ago (Stuart 1991).

EDENTATA

- Glyptotherium floridanum***
glyptodont
- Glossotherium harlani***
big-tongued ground sloth
- Megalonyx jeffersonii***
Jefferson's ground sloth
- Nothrotheriops shastensis***
Shasta ground sloth

CARNIVORA

- Canis dirus***
dire wolf
- Canis lupus**
gray wolf
- Ursus americanus**
black bear
- Ursus arctos**
brown (grizzly) bear
- Arctodus simus***
giant short-faced bear
- Smilodon fatalis***
saber tooth
- Panthera leo atrox***
American lion
- Panthera onca**
jaguar
- Miracinonyx trumani***
American cheetah
- Felis concolor**
mountain lion

PROBOSCIDEA

- Mammut americanum***
American mastodon
- Mammuthus columbi***
Columbian mammoth
- Mammuthus exilis***
dwarf mammoth
- Mammuthus jeffersonii***
Jefferson's mammoth
- Mammuthus primigenius***
woolly mammoth

PERISSODACTYLA

- Equus conversidens***
Mexican horse
- Equus occidentalis***
western horse
- Equus sp.***
other extinct horses or asses
- Tapirus californicus***
extinct tapir

ARTIODACTYLA

- Camelops hesternus***
western camel
- Hemiauchenia macrocephala***
long-legged llama
- Mylohyus nasutus***
long-nosed peccary
- Platygonus compressus***
flat-headed peccary
- Odocoileus hemionus**
mule deer
- Odocoileus virginianus**
white-tailed deer
- Navahoceros fricki***
mountain deer
- Rangifer tarandus**
woodland caribou
- Alces alces**
moose, moose deer
- Cervus elaphus**
wapiti, elk
- Antilocapra americana**
pronghorn
- Oreamnos harringtoni***
extinct mountain goat
- Oreamnos americanus**
mountain goat
- Ovis canadensis**
bighorn
- Euceratherium collinum***
shrub ox
- Bootherium bombifrons***
bonnet-headed musk ox
- Bison spp.***
extinct taxa of bison
- Bison bison**
bison

The Ultimate in Rewilding

In the fall 1998 issue of *Wild Earth*, Michael Soulé and Reed Noss proposed *rewilding* as the foundation of a continental conservation strategy. Central to this proposition is the recovery of existing top predators such as grizzlies, cougars, and wolves to large parts of their native ranges. Here we consider the ultimate in rewilding. While the diversity of America's charismatic megafauna was severely impoverished in the late Pleistocene (for western North America extinctions see Table 1), we can turn to Africa and India for surrogates for restoration. We suggest that the project begin by restarting the evolution of the most influential of the missing species, the extinct animals most likely to have exerted the greatest influence on their natural environment. Based on what is known of living megaherbivores in Africa and Asia, and based on the fossil record of the New World, there is one clear choice, animals as potent as fire in their dynamic influence on ecosystems. If we want the "super-keystone species" (Shoshani and Tassy 1996), second only to our own in their capability for altering habitats and faunas (Buss 1990, Sukumar 1994), we should start with the restoration of living proboscideans—with African and Asian elephants.

We fully expect that the initial reaction to the proposal of free-ranging elephants in the Americas will shock and confound many conservationists and naturalists. What could be more foreign in the New World than free-ranging elephants? Isn't this a heretical idea for those of us inclined toward deep reverence for the wild?

It all turns on what one regards as wild. For example, the gomphotheres, a family of Neotropical elephants that prospered in the Americas for well over ten million years (Shoshani and Tassy 1996), vanished at the end of the Pleistocene around 13,000 years ago, along with mammoths and mastodons. All deserve consideration as a natural part of Wild America. With such a rich fossil record and such a late American extinction, it is natural to consider restarting New World evolution of the Proboscidea with whatever taxa of elephants are left.

We are keenly aware that living African (*Loxodonta africana*) and Asian (*Elephas maximus*) elephants are not conspecific with fossil *Mammuthus* (mammoths) or other native Proboscidea of the New World. But all are in the same family and some taxonomists have considered *Elephas* and *Mammuthus* to be quite close, even congeneric; thus, an Asian elephant living today in Thailand is more closely related to the extinct mammoths of North America than to its African cousin. African and Asian elephants are the only members of the Order Proboscidea that were not lost in the megafaunal crisis of the late Pleistocene. Thanks to a surging human population and to

poaching for ivory, elephant numbers have crashed in this century and they are now at risk in many parts of their historic range. Recent estimates of numbers of African elephants are 550,000 to 650,000 (Douglas-Hamilton and Michelmore 1996). Numbers of surviving wild Asian *Elephas* are less by an order of magnitude, estimated between 37,500 and 54,600 animals (Sukumar and Santiapillai 1996).

Unlike explosively reproducing aliens of the New World such as kudzu, Africanized bees, or zebra mussels, animals reproducing as slowly as elephants, with an intrinsic rate of increase of about five percent per year, should be controllable. To avoid unacceptable methods of regulation (for 20 years park rangers shot 300 to 800 elephants annually in the Kruger National Park, Republic of South Africa) Jay Kirkpatrick of ZooMontana and his collaborators (ms.) have perfected a technique for limiting elephant populations by darting females with a long-lasting birth-control compound. Elephant forays beyond the perimeter of a reserve can be deterred, as in Amboseli National Park in Kenya, by an electrified wire. For a New World elephant park suitable for wide-ranging family units, we suggest a part of the lower Colorado River or the Rio Grande. Like most of North America, both regions were once ranged by mammoths. Both river systems are heavily invaded by alien *Tamarix*, riparian trees widely regarded as undesirable and a potential target for removal by elephants. The river banks support alien Bermuda grass (*Cynodon dactylon*), an African species eaten by elephants (Moss 1988). Other potential sites for elephant introductions would be anthropogenic savannas in Central or South America—once home to gomphotheres—now pasturing livestock.

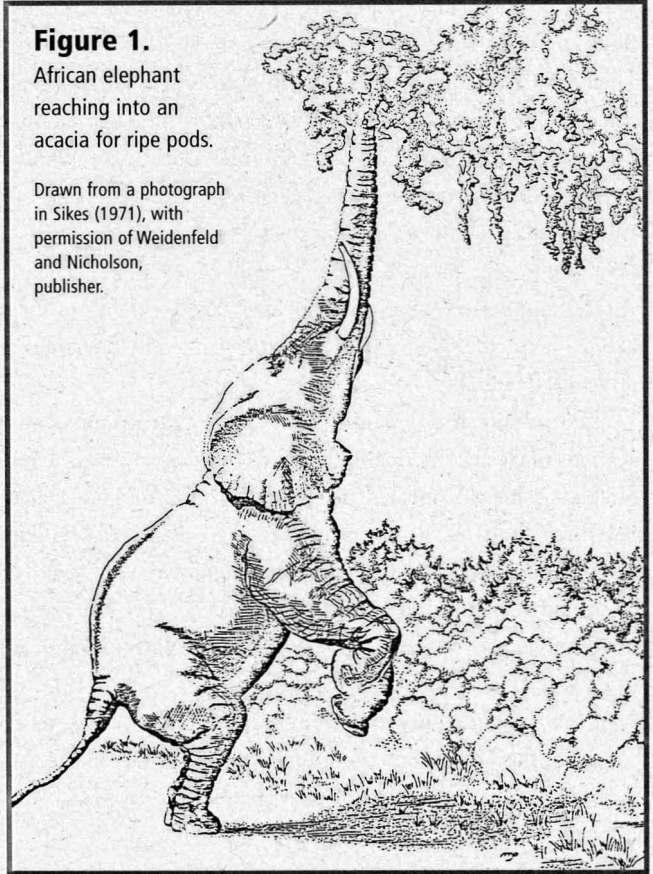
Raising the Columbian Curtain

In planning New World restorations, conservationists have endowed the large mammals of historic time with the exclusive status of hallmarks, or flagships, overlooking the missing large mammals of the late Pleistocene. The animals that the first explorers and settlers saw and wrote about became incorporated in ideas of what constituted American wildness. The viewpoint imposed by a "Columbian Curtain" is unrealistic in evolutionary time. The historic fauna lacks the largest and most representative animals of the continent. Among the more common fossils of the late Pleistocene, which was dominated by equids, camelids, bovids, and especially bones, teeth, or tooth plates of proboscideans, only bison is represented (Graham and Lundelius 1994).

The opportunity is at hand to explore the evolutionary view. During the Cold War the US Fish and Wildlife Service took the first step in intercontinental restoration by shipping American musk oxen to Siberia to reestablish breeding herds in the north-

Figure 1.
African elephant
reaching into an
acacia for ripe pods.

Drawn from a photograph
in Sikes (1971), with
permission of Weidenfeld
and Nicholson,
publisher.



ern part of a continent where musk oxen lived until around three thousand years ago. Recently Sergi Zimov has started a Pleistocene Park in Siberia and plans to add woodland bison from Athabaska, Canada, to his mix of Siberian ponies and musk oxen. Zimov expects that under heavy use, unpalatable plants such as mosses and ericads will be torn up, trampled, and manured, to be replaced by more productive steppe tundra of subarctic grasses, a community that vanished with the extinction of mammoths (Stone 1998). His experiment merits watching. However, Asia and Africa have much more to offer the New World than vice versa.

As a result of the late Pleistocene extinctions we live in a continent of ghosts, their prehistoric presence hinted at by sweet-tasting bean pods of mesquite (*Prosopis*), honey locusts (*Gleditsia*), and monkey ear (*Enterolobium*). Such fruits are the bait evolved to attract native large animals that served as seed dispersers (Janzen and Martin 1982; Fig. 1). Foraging behavior of introduced livestock can help us understand how thorns, repellent oils, terpenes, tannins, and other secondary compounds might have protected plants from being overeaten by extinct megaherbivores.

When megafaunal extinction struck North America in the late Pleistocene, at least seven species of proboscideans—and the entire Order Proboscidea—vanished. Unlike erratic back-

ground extinctions that sputter along randomly through the eons, often in step with evolutionary replacements, the late Pleistocene extinctions were catastrophic and there were no replacements. Given their evident success over the last 15 million years and the late hour of their New World extinction, a mere 13,000 years ago or so, we suggest that bringing back the Proboscidea is by no means as witless as it might seem at first. It is not the same as introducing goats or pigs onto an oceanic island whose native plants lost long ago whatever defenses they once had to protect themselves against onslaught by the tongues and teeth of large herbivores.

In evolutionary time the flood plains, grasslands, and savannas of North America harbored a stunning variety of large animals—some 41 species in western North America alone, over three times as many as were present historically when Lewis and Clark detected bison, elk, pronghorn, brown (grizzly) bears, and ten others listed in Table 1. The losses included native mammals in size classes to match the largest found in Africa and Asia (Stuart 1991). Since totally unrelated groups of organisms, including marine invertebrates, did not vanish, as at the end of the Cretaceous 65 million years ago, the end of the Pleistocene was not a time of mass extinction. Instead, what happened in America was an extinction of the massive (plus their parasites and commensals, see Schmidt et al. 1992).

With time the distinction may vanish. Recently the blighting of coral reefs and the destruction of tropical forest biota, for example, suggests that the late Pleistocene extinctions are no more than the overture to a full-blown mass extinction underway right now, potentially capable of overtaking the Cretaceous in magnitude of loss, and, unlike the mass extinction at the end of the Cretaceous, undeniably of our own making.

Jefferson and Living Behemoths

Two and a half centuries ago the fossils of the late Pleistocene fascinated Ben Franklin, the Quaker naturalist John Bartram, and Thomas Jefferson. Jefferson philosophized against the idea of extinction and thought the fossil bones of mastodons and ground sloths meant that behemoths were still alive. According to Jefferson, the Indians knew of them. Big bones of proboscideans had been found in Big Bone Lick in Kentucky. In the early 1800s the public flocked to see the first skeleton of a mastodon exhibited in the new nation's first museum of natural science and art, located in Philadelphia. Charles Wilson Peale, owner of the museum, purchased the rights and excavated a mastodon in Orange County, New York. Adding the mastodon to his other natural history displays, Peale charged 25 cents at the front door and an additional 50 cents to enter the special room

with the mastodon skeleton (Sellers 1980). Some of the public excitement reflected a lingering debate about whether the animals were actually extinct.

While the Indians as well as European explorers encountered the fossil bones or teeth of large extinct animals, no solid evidence emerged of living American proboscidea. What we know of the American mastodons, the Columbian mammoths, the imperial mammoths, the woolly mammoths of the boreal and subarctic regions, the dwarf mammoths of Santa Rosa and other islands off the California coast, and the gomphotheres of the tropics comes strictly from fossils and the fossil record.

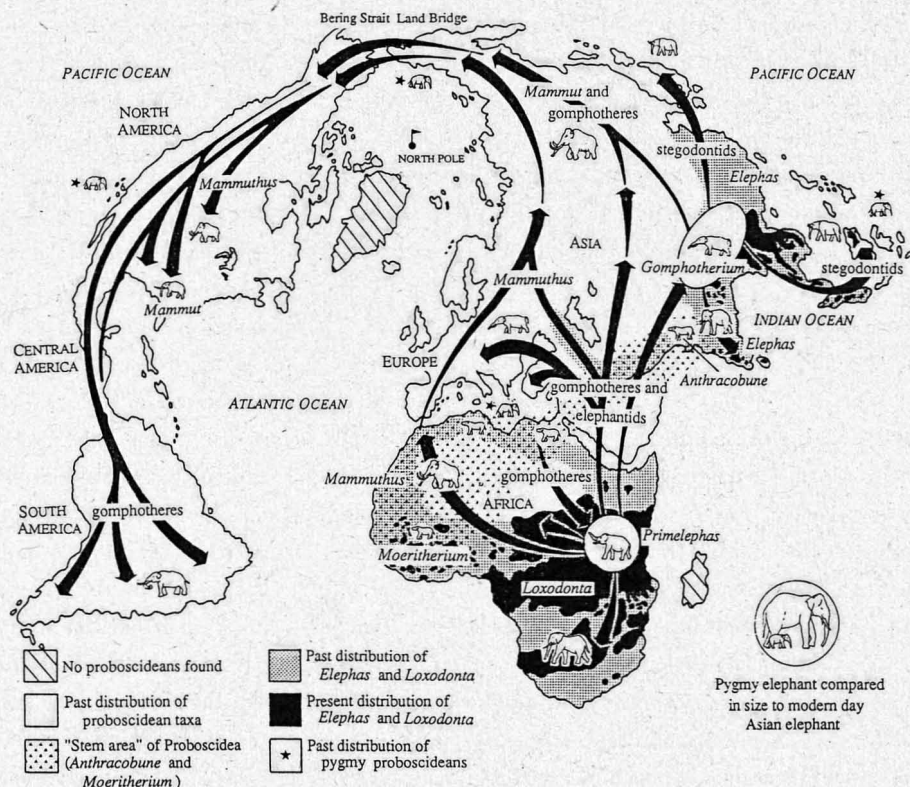
Bones of the ice age megafauna turn up in lake sediments, spring deposits, flood plain alluvium, frozen ground, ancient dune deposits, and caves. Over one hundred fossil mammoth localities are known from Arizona alone, and there are almost two hundred localities for mammoths and mastodons in Michigan. On the Atlantic Coast the great molars of mammoths and mastodons appear in the haul of trawlers fishing the shallow bottom of the continental shelf and mastodon remains have been dredged from the Harlem River Canal in Manhattan. The permafrost of the unglaciated subarctic in Alaska and Siberia is richer in mammoth remains than most temperate regions, probably due to better preservation of fossils rather than a result of larger populations of mammoths living in the subarctic. Occasionally both the frozen ground and the driest of desert caves yield not only bones but dung, hair, hide, horns, hooves, and the desiccated tissues of extinct animals, including mammoths. Thanks to many radiocarbon dates, it appears that both North America's proboscideans and many other genera of large mammals made their exit 11,000 radiocarbon years ago (Martin 1990, Stuart 1991) which geochemists calibrate to about 13,000 calendar years.

What caused such a loss, so late in the Pleistocene? Could it have been an asteroid hit, a circumstance that many believe accounts for heavy extinction including the loss of dinosaurs at the end of the Cretaceous? Evidently not. There is no trace of an asteroid impact large enough to generate global repercussions that late in the fossil record.

Moreover, throughout the islands and continents of the planet, late Pleistocene extinctions were not synchronous, as would be expected in the case of a cosmic or climatic accident. Radiocarbon dates show that they were globally sequential, or what geologists call "time transgressive." The time transgressive pattern creates problems for models based on sudden global change including changes in climate. While large animal extinctions impoverished North and probably South America around 13,000 years ago, they seem to have struck Australia much earlier, perhaps 50,000 years ago (Miller et al. 1999). The

A reconstruction of proboscidean world distribution pattern.

Artwork by J.S. Grimes and G.H. Marchant. From *The Proboscidea: Evolution and Palaeoecology of Elephants and their Relatives* edited by Jeheskel Shoshani and Pascal Tassy (1996). Reprinted by permission of Oxford University Press.



last population of woolly mammoths—including some dwarfs just two meters tall—vanished from Wrangel Island in the Arctic Ocean off Siberia only 4000 years ago, surviving their North American kin by roughly 9000 years. In imagining that mammoths might still be alive it turns out that Thomas Jefferson was off by only four millennia!

A Deadly Syncopation

In the South Pacific over 3000 years ago the extinctions of thousands of species or populations of flightless birds began with the spread of the Lapita Culture from the southern Solomon Islands to Fiji and Tonga (Steadman 1995). Insular extinctions involving megapodes, pigeons, parrots, flightless rails, and populations of pelagic sea birds—extinctions much more severe than those recognized in historic time—swept through the South Pacific, reaching New Zealand to obliterate its giant flightless birds, the moas, beginning 1000 years ago. By then the shadow of extinction had already reached Madagascar. The island continent lost some 16 species of giant lemurs up to the size of a gorilla (living lemurs do not exceed 10 kg), at least two species each of hippos and giant tortoises, and several giant flightless birds, perhaps including the *roc* mentioned by Marco Polo. In dramatic contrast, over the last 40,000 years Africa and tropical Asia lost only a few large ungulate species.

These prehistoric extinctions follow the ancient footsteps of our species, out of Afro-Asia and onto other continents and eventually even to remote oceanic islands, in what Ross MacPhee of the American Museum calls a “deadly syncopation” of human arrival and faunal loss, the size of animals lost scaled to size of land mass. It’s impossible to fit this pattern to any known climatic or cosmic event.

To be sure the traditional view, that climatic or environmental change must also be involved, persists. However, it is worth emphasizing that the idea of humans triggering late Pleistocene extinctions—perhaps by overkill—debated in Martin and Wright (1967) and Martin and Klein (1984), is gaining traction (Brown and Lomolino 1998, MacPhee 1999, Soulé and Noss 1998, Ward 1997). And the question of exactly what caused the extinctions need not deflect us from the prospect of repairing some of the damage.

In the long pull all species are doomed to extinction, just as death is the inevitable fate of all individuals. Most species that ever lived on Earth are no more. But this is a poor excuse for turning our back on the extraordinary loss of flagship species on our watch. By “loss on our watch” we mean not just the extinctions of this or the last five centuries of European conquest in the New World; we mean the time scale of our species on this continent, the last 13,000 years at least. While human remains

are rarely associated with extinct megafauna, dates on the Clovis culture and the extinct fauna overlap around 13,000 years ago (Stuart 1991). We have the opportunity to restart the evolution of proboscideans, along with horses, camels, and other extinct groups native in the Americas for millions or tens of millions of years. The global pattern of extinction outlined above involved many kinds of animals of tremendous interest to us, in particular warm-blooded, bright-eyed terrestrial vertebrates, mammals, and birds, including many of large size. Our strongest emotions are generated by those animals most like ourselves in intelligence and behavior. What can be done?

American Requiem; African Visions

For starters, it is time to mourn our dead, especially the total loss of the mammalian Order Proboscidea. In North America we need a "Mammoth Extinction Day" and in South America a "Gomphotherium Extinction Day." This might take place sometime around the summer solstice. Any of the numerous fossil localities known to yield bones of Proboscidea would be suitable, such as Rancho la Brea with its magnificent Page Museum in Hancock Park, Los Angeles, California. An especially appropriate place for a wake would be at the Mammoth Site in Hot Springs, South Dakota, a paleoecological cathedral where 100,000 visitors a year pay a modest admission to marvel at a unique *in situ* exhibit of splendidly preserved mammoth bones in the process of being excavated from the most concentrated natural deposit of mammoths known on the continent. With the help of Earth Watch teams, Professors Larry Agenbroad and Jim Mead of Northern Arizona University have uncovered some fifty individual mammoths of two species plus bones of the giant bear, *Arctodus*.

The dimensions of the unexcavated sinkhole deposit suggest that along with other Pleistocene fossils another fifty mammoths remain to be discovered. Most of the animals sexed to date have proved to be subadult males, suggesting that females, like African elephants, ranged in matriarchal herds led by an experienced elderly matriarch, smart enough to escape the treacherous if enticing sinkhole. The Mammoth Site publishes books on research, symposium volumes, and popular interpretations of the site and its mammoths as part of their outreach to the general and scholarly public.

From the Hot Springs Mammoth Site tourists drive to Wind Cave National Park to see a free-ranging bison herd. There ecologists study the interrelationships between short grasses, grazing, and fire. Bison are increasingly popular as a meat animal. Near Truth or Consequences, New Mexico, over 1000 bison, as well as prairie dogs and mountain sheep, were recently established in place of cattle on the 600 square mile Armendaris Ranch. But

bison are a small part of the pre-extinction Wild West. Furthermore, according to the fossil record bison entered North America only a quarter of a million years ago, well after the arrival and evolution of New World Proboscidea. Even more interesting than determining the adaptability of bison on the Armendaris (where they were unknown historically) would be to determine the adaptability of elephant family units mixed in with the bison.

Thanks to the fossil record we are not totally ignorant of the paleoecology of extinct American Proboscidea. A remarkable chance to learn about mammoth diet has been gleaned from the dry dung deposits found in a large cave in southern Utah (Agenbroad and Mead 1996). Dung balls nine inches in diameter discovered in the 1980s by a National Park Service team of resource managers proved too big and the texture of the plant remains in the boluses too coarse to match those of the only other species they resembled, the Shasta ground sloths, whose dung is known from other caves in the region. The mean of 16 radiocarbon dates on mammoth dung balls was 14,500 calendar years, and the plant material in the dung indicated a cooler climate than occurs in southern Utah today. The extinct mammoths ate mainly grasses, sedges, and other riparian plants, salt bush, prickly pear, and even some needles of blue spruce. The cathedral-like cave they entered was more than large enough for mammoths. The animals deposited an estimated 255 cubic meters of manure. But much more about elephant ecology can only be learned from live animals.

When elephants dig for water in the dry season the water holes they leave behind attract other species. They thin out dense stands of low trees and shrubs. Undoubtedly the extinct mammoths, mastodons, and gomphotheres did the same. In the process elephants improve forage production for other grazers (Owen-Smith 1988, Buss 1990). The most interesting prospect for restarting the Proboscidea in America comes from what managers have discovered in Kenya's Amboseli Park just north of Kilimanjaro. According to David Western (1997):

If elephants and cattle had their way, they would trade places. In Amboseli...you see herds of cattle filing into the park to graze, passing elephants headed out to browse. With elephants and cattle transforming the habitat in ways inimical to their own survival but beneficial to each other, they create an unstable interplay, advancing and retreating around each other like phantom dancers in a languid ecological minuet playing continuously over decades and centuries. Habitats oscillate in space like a humming top, driving and being driven by climate, animals, and people.

In the New World we can substitute bison for cattle to see if bison, too, will dance the languid ecological minuet with African elephants, surrogates for the extinct American Proboscidea, to the benefit of the American range!

Our proposal to establish free-ranging elephant herds in the New World is not to conduct an agricultural but an ecological experiment. We have an extraordinary opportunity to learn more about how Nature works. How are fruits dispersed? What is the relationship between elephants, vegetation, and wild-fire? Long smitten with the beguiling concept of a "forest primeval" (the climatic climax of Clementsian ecologists), North American conservation biologists have had to shift gears, adopting a more flexible concept of multiple stable states or discordant harmonies (Botkin 1990, Drury 1998).

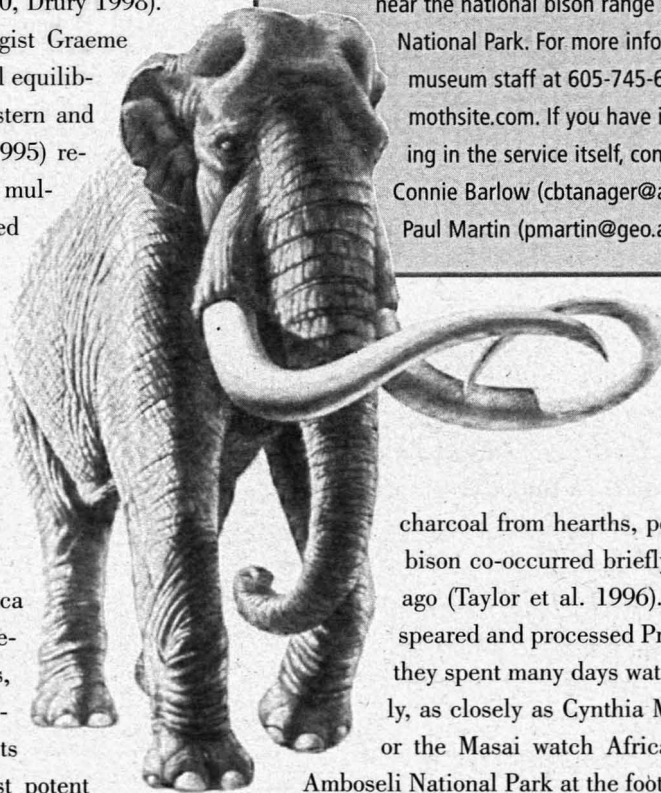
Over twenty years ago conservation ecologist Graeme Coughley (1976) found no attainable natural equilibrium between elephants and forests in eastern and southern Africa. More recently Sinclair (1995) reported that African elephants and fire reach multiple stable states. It appears that introduced elephants might have a great deal to teach us about the dynamic nature of wildness in America in evolutionary time. In the absence of elephants, inferences made on the dynamics of American vegetation types could be as one-sided as those made in the absence of fire.

Conclusions

The demise of Proboscidea in North America represents not only the loss of ecological relationships and evolutionary possibilities, but a foreclosure on entire realms of scientific inquiry. Clearly American ecologists suffer blind spots if the largest and most potent megaherbivores native to the continent are missing. What might we learn from their reintroduction? David Western's vision of a timeless minuet between grazers and browsing elephants in Amboseli fuels thoughts of how to attempt an American experiment. Here elephants need not dance with grazing cattle. We have bison. People, bison, and elephants once coexisted in America. We see this in the Clovis sites excavated by the Arizona State Museum along the San Pedro River in southeastern Arizona. Clovis points, a shaft straightener of mammoth bone, stone blades, knives, and lithic debris are associated with the bones of mammoths, bison, and other extinct megafauna. Judging by many radiocarbon dates on

A Mammoth Memorial Service

will be held June 26, 1999, at the Mammoth Site of Hot Springs, South Dakota. Join Paul Martin, Connie Barlow, museum staff, excavation volunteers, and visitors for what may well be the first memorial service conducted for an extinct Pleistocene animal. The service will be one component of a weekend commemoration of the 25th anniversary of the discovery of this mammoth graveyard, the largest accumulation of intact mammoth bones in the Western Hemisphere. More than fifty skeletons have been unearthed, and excavation is still underway. Hot Springs is in the southwestern corner of South Dakota, very near the national bison range of Wind Cave National Park. For more information contact museum staff at 605-745-6017, or www.mammothsite.com. If you have ideas for participating in the service itself, contact: Connie Barlow ([cibtanager@aol.com](mailto:cbtanager@aol.com)) or Paul Martin (pmartin@geo.arizona.edu).



Columbian Mammoth
(*Mammuthus columbi*)

charcoal from hearths, people, mammoths, and bison co-occurred briefly around 13,000 years ago (Taylor et al. 1996). The early Americans speared and processed Proboscidea. We suspect they spent many days watching them very closely, as closely as Cynthia Moss or David Western or the Masai watch African elephants today in Amboseli National Park at the foot of Kilimanjaro. While we doubt she was thinking of the New World, Cynthia Moss's words (1988) are compelling:

I have realized that more than anything else, more than scientific discoveries or acceptance, what I care about and what I will fight for is the conservation, for as long as possible, not of just a certain number of elephants, but of the whole way of life of elephants. My priority, my love, my life are the Amboseli elephants, but I also want to ensure that there are elephants in other places that are able to exist in all the complexity and joy that elephants are capable of.

From mammoths and mastodons the Clovis foragers would have learned much about edible wild plants, where they grew, their season of fruiting, and their palatability. In the New World we suspect it was the extinct megafauna that introduced the first Americans to the sweet bean pods (or *péchita*, an Indian name becoming part of borderland Spanish) of the mesquites, a valuable food plant for people living off the land. From the large mammals of the New World the newcomers learned the right season to rip apart dagger-leaved agaves for their sugary hearts, a rich source of calories. Surely the early Americans followed the game trails of the last New World elephants through the tropics, in the process learning about palm fruits and other fruits as attractive to people as to Proboscidea.

Now African *Loxodonta*, or Asian *Elephas*, or both, can show us some of the coevolutionary secrets of America when it was truly wild. Beyond Pleistocene parks we need Pleistocene proving grounds, places to fathom as well as to celebrate our lost wildness. Above all the time has come to consider restarting elephant evolution by enabling elephants to reinvent their ecology on the continent that once constituted an important part of their global range. What is at stake is complexity, joy, and the whole way of life of elephants. ☺

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Acknowledgements For editorial or technical help we thank Larry Agenbroad, Connie Barlow, Julio Betancourt, Gary Haynes, Mary Ellen Morbeck, Mary Kay O'Rourke, George Rabb, Joe Truett, Raymond M. Turner, David Western, and Bill Willers.

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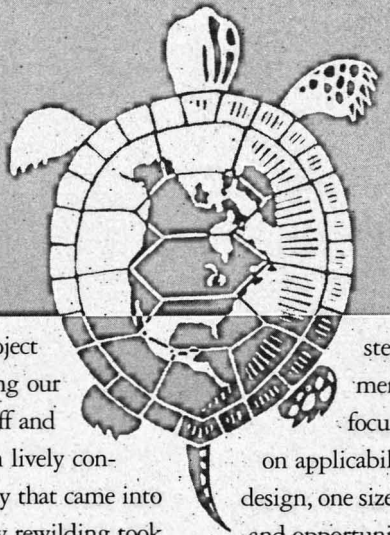
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The Wildlands Project

Update

BY STEVE GATEWOOD



Re-wilding. Rewilding. To return to a state of wildness. To help degraded lands and waters regain health. To help Nature heal. This issue of *Wild Earth* provides a forum to advance discussion of rewilding and begin to tease out how people and organizations will receive, defend, debate, accept, or attack it as an approach to protecting Nature.

Drs. Michael Soulé and Reed Noss began this dialogue in the fall issue of *WE* with the first full paper dedicated to this evolving concept ("Rewilding and Biodiversity: Complementary Goals for Continental Conservation"). Here at The Wildlands Project (TWP) we have been discussing rewilding among our science professionals and with the rest of the staff and board for more than a year. It has been an often lively conversation, and as with the concept of connectivity that came into the limelight only a decade ago, we wonder why rewilding took so long to be recognized as a fundamental principle for Nature conservation. One thing is certain—with prominent biologists and TWP board members such as Soulé, Noss, John Terborgh, Brian Miller, and others endorsing rewilding, it will be at the forefront of our conservation strategy well into the future.

This spring, Island Press will publish *Continental Conservation: Scientific Foundations of Regional Reserve Networks*, the final chapter of which follows here. The book is a compendium of large-scale reserve design principles, with chapters written by some of the best minds in the field. Edited by John Terborgh and Michael Soulé, and resulting from a Science Workshop that TWP organized in November 1997, this text will be "required reading" when our new Reserve Design Team makes the rounds to visit regional TWP cooperators to assist in developing reserve design proposals.

The team, composed of Wildlands Ecologist Barbara Dugelby, Science Director Michael Soulé, TWP Chairman Dave Foreman, and an as yet to be hired Reserve Design Coordinator, will focus on helping cooperators with science challenges related to reserve design, making sure the proposals (and proposal developers) are ready for peer review, and helping to assure that regional wildlands proposals address implementation steps as an integral part of their development process.

As regional reserve designs approach or pass peer review, the challenge of implementation looms. In February, TWP hosted an Implementation Workshop; similar in format to the Science

Workshop, the event brought together leading political and social scientists to consider the challenge of translating a map-based vision to on-the-ground conservation.

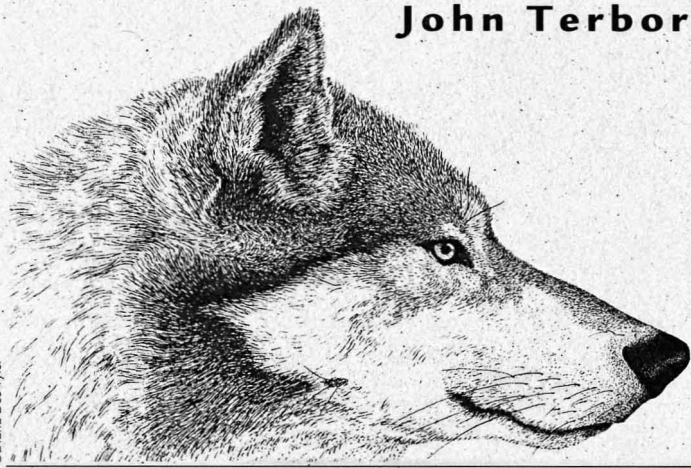
Unlike the Science Workshop, however, the information resulting from this gathering will not be collected for publication in a book. Rather, we hope to develop a loose-leaf binder (similar to the "TWP Framework Package") that can be added to or revised easily. Using the Sky Island/Greater Gila Nature Reserve Network (SI/GGNRN) as a model, participants will review, evaluate, add to, delete, and otherwise analyze the 55 steps identified as necessary for successful implementation of SI/GGNRN. Although this model is focused on the Southwest, we will be keeping an eye on applicability and needs in other regions. As with reserve design, one size does not fit all—consideration of local obstacles and opportunities is essential for successful implementation.

Staff changes: Along with Michael Soulé coming on staff as Science Director, other personnel changes are happening at TWP. Michael stepped down as Board President in December and was replaced by Harvey Locke of Alberta, Canada. Rod Mondt, Program Manager, left us in February and is doing consulting work from a home office. Business Manager Hillary Oppmann left in March to spend time travelling. We wish them all our best! Jennifer Dastrup is back in the office full time (with new son Jeremy part of each day) and has taken over as Office Manager. We hired Michael Monyak as Business Manager to assume the financial duties that Hillary happily left behind. Kevin Gaither-Banchoff has come on board as Development Director to generate the funds for Michael to manage. Andy Robinson will still consult with TWP on development and organizational matters, but at a reduced level, and will primarily assist cooperators. And with Kim Vacariu joining us as Communications/Outreach Director late last summer, the office was bursting at the seams (seven full-time people in two rooms by December). So we have expanded into the adjacent suite—what a relief. If you're in Tucson, please drop by so we can get to know you.

In closing, I would like to thank the 230+ people who attended our Grassroots Rendezvous in Estes Park, Colorado last October. We believe it was a great success and look forward to doing it again in the year 2000 when implementation should be the theme. 🍀

Steve Gatewood is Executive Director of The Wildlands Project.

Why We Need Megareserves:



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Humans and Nature can coexist, but that coexistence will not come about under present conditions. The revival and survival of biodiversity—the wondrous variety of living things—will require the establishment of a network of large Nature reserves across North America.

ENVIRONMENTAL EXCESSES OF THE PAST AND PRESENT have led to the current global extinction crisis. While much publicity has been given to the threat of habitat loss in the tropics, North America is by no means immune to threats of extinction. The number of species officially listed by the US Department of Interior as Endangered has already grown to over one thousand, and nearly five times this number are in line for listing. The specter of an endlessly-expanding list has the US Congress balking at renewing the Endangered Species Act.

Clearly we are approaching a turning point: a new policy for biodiversity will be enacted, but no one knows what that policy will be. If we stay on the same path—clearcutting the last old-growth forests, overgrazing grasslands, fragmenting habitats, draining wetlands, polluting rivers—we know what will happen. Much of North America will lose every vestige of its wild origins, as has already happened over most of Europe. But to embark on a new path, we need a vision for the future. Do we want an America that is even more crowded, congested, and polluted than it is today? Do we want a continent that is wiped clean of old-growth forests and large carnivores, a continent that retains only remnants of its migratory birds, reptiles, amphibians, and native freshwater fish? Do we want to live in a continent of weeds?

Very few voters would answer these questions in the affirmative. North America north of Mexico has achieved a level of prosperity unimagined a century ago. For a large majority of citizens, material comfort is a fact of life. Yet the politicians who represent the North American people appear obsessed with a desire for “more,” rather than “better.” The quest for unending growth is the economic counterpart of the frontier mentality; today, however, consumer goods have replaced land, furs, and other raw natural resources. Isn't it time that North Americans started to enjoy their prosperity? Isn't it time to focus on quality rather than quantity? Everyone should be asking: “What kind of a land do I want my children and grandchildren to live in?” Answering that question is what the book *Continental Conservation* is about: quality of life, not just for a few, but for everyone; not just for human beings, but for all native species.

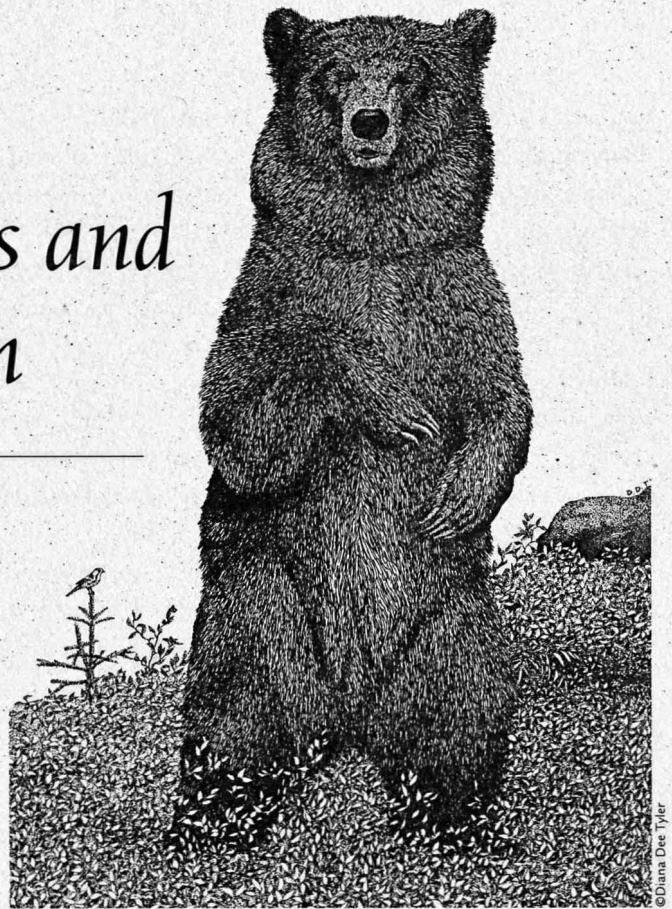
This article is adapted from the summary chapter in the forthcoming book *Continental Conservation: Scientific Foundations of Regional Reserve Networks* (edited by John Terborgh and Michael Soulé) to be published by Island Press in May. Order from Island Press (please quote “Dept. WE”) at 800-828-1302; fax 707-983-6414; or visit www.islandpress.org.

Large-scale Networks and How to Design Them

Is the future going to be simply an extension of the past—with ever more crowding, congestion, and resource depletion? Here we offer an alternative vision. It is a future in which humans are surrounded by beauty, spaciousness, and abundance. It is a future in which people derive spiritual nourishment from Nature—a future in which we are no longer a destructive force but part of a larger whole. We look forward to a world in which the needs of future generations are respected as much as those of our own generation. We foresee a world in which there is freedom to live and enjoy, but not to destroy. Toward such a future, we sketch a roadmap. Many of the details are incomplete, but we see clearly where we want to go and we know roughly how to get there. We hope others will want to join us. The journey won't all be easy, but it is one well worth making.

HUMANS AND NATURE CAN COEXIST, but that coexistence will not come about under present conditions. The revival and survival of biodiversity—the wondrous variety of living things—will require the establishment of a network of large Nature reserves across North America. Large areas managed for biodiversity are needed to ward off a host of ecological pathologies. Through conservation-oriented management of extensive core and multiple-use areas, the vital abiotic and biotic processes that sustain biodiversity can be perpetuated. Outside of biologically viable large reserves, ecological pathologies will continue to spread and take their toll.

Perhaps the most serious ecological pathology affecting Nature in North America is fragmentation. Roads, agricultural lands, and urban expansion fractionate once-continuous natural communities, creating isolated habitat islands surrounded by edges and exposed to a variety of pernicious influences emanating from nearby human settlements. Among the most predictable consequences of habitat fragmentation are



herbivore and “mesopredator” release, terms that refer to the explosive increases in disrupted landscapes of herbivores, such as the white-tailed deer and beaver, and omnivores, such as the raccoon and opossum. The superabundance of these and other mammals is presumably a direct consequence of the extirpation of large carnivores that took place in the 19th century.

Forest fragmentation has particularly affected migratory songbirds, which have declined or disappeared from disjunct woodlots all over the continent. Birds attempting to nest in forest fragments suffer unsupportably high rates of nest predation and nest parasitism by Brown-headed Cowbirds, so that nesting success is insufficient in many regions to compensate for adult mortality. The syndrome is so widespread that entire states (e.g., Illinois) have become population sinks for a host of common species (Robinson et al. 1996). In the Southeast, the Bobwhite, once the region's most popular game bird, has become so rare that it is a treat nowadays to hear its clarion song.

In large parts of the East, superabundant white-tailed deer are decimating acorn crops and tree seedlings, thereby altering tree recruitment patterns to an alarming degree (Alverson et al. 1994, McShea et al. 1997). Feral pigs in the South are equally destructive to forests and to the wildflowers that contribute up to 80% of the plant diversity of many temperate forests (Abramson 1992). Overbrowsing by ungulates,

native and introduced, is so widespread that wildflowers are disappearing, even in some of the most solicitously protected old-growth forests, such as the Heart's Content grove in Pennsylvania (Miller et al. 1992, Rooney and Dress 1997).

Alien species constitute another form of ecological pathology. Thousands of intentional and unintentional introductions have allowed aliens to become a pervasive presence in nearly every habitat and body of water on the continent. The situation in the Hawaiian Islands, where more than 4000 species of plants have been introduced, is even worse than on the mainland. When one notes that the number of native Hawaiian plants is only about 1100, the magnitude of the problem comes into focus. Stepped-up efforts to limit the entry of alien species have been partially effective, but new invaders appear every year nonetheless.

In the northern plains, poor nesting success of waterfowl is attributed to abnormally abundant nest predators and the invasion of Russian olive, an alien tree. Russian olive creates thick arboreal screens around prairie potholes, blocking the flight paths of diving ducks and eliminating otherwise prime sites as breeding habitat. Throughout the Middle West, inadvertently introduced zebra mussels are spreading rapidly in polluted streams, replacing native mollusks and threatening some with extinction. Huge areas of the intermontane West have been invaded by cheat grass, an invader from southern Russia that destroys the rangeland for domestic livestock and wildlife alike. In the Southwest, another aggressive alien, buffle grass, threatens to destroy the picturesque Sonoran Desert because it is flammable and can introduce fire to a system that is not adapted to it.

Collectively, alien species are a scourge. They dilute indigenuous plant communities, alter the character of habitats, outcompete, kill, or eat native species, transmit diseases, and cause devastating blights. Alien species can be described as the ecological analog of cancer. And like cancer, many alien species have proved refractive to the best efforts of modern science in scores of unsuccessful efforts to contain, control, or eradicate them. The one generality that seems to apply is that aliens are slow to invade intact native communities. But that observation offers little solace, because intact native communities cover less than ten percent of North America south of the boreal forest.

If fragmentation, expansion of alien species, and many other adverse trends—such as pollution, overexploitation of useful species, and climate change—continue unchecked, the number of imperiled species in the United States and elsewhere in North America will escalate until we are simply



overwhelmed. The Endangered Species Act, for all its good intent, will become irrelevant to stanch the tide. We shall then discover with shock that we have lost the battle to conserve North America's biological heritage.

IN THE SIMPLEST TERMS, the battle against extinction is being lost because the processes that maintained biodiversity prior to human settlement have been disrupted: More than 90% of the land in the Lower 48 states has been logged, plowed, mined, overgrazed, paved, or otherwise modified from the presettlement condition. Fire suppression has altered the composition of plant communities in nearly every state (Leach and Givnish 1996). Top predators have been extirpated or reduced to scattered populations throughout much of the continent. Rivers have suffered even worse insults, having been dammed, channeled, diked, and converted to open conduits for human, agricultural, and industrial wastes (Dynesius and Nilsson 1994). Accordingly, aquatic organisms are under siege to a much greater extent than terrestrial life (Abramovitz 1996).

If North America is not to lose species by the hundreds or even thousands in the 21st century, it will be imperative to heed Aldo Leopold's aphorism that the intelligent tinkerer saves all the pieces. That policy would be hard enough in the best of cases, but we have made matters worse by losing some pieces already (extinct species) and by having to cope with thousands of others that do not fit (alien species). Putting Nature back together will not be easy. The least of the challenges is that the necessary science is still incomplete, for scientists do know much of what can and should be done. The greater challenge, by far, is effecting implementation.

Here are some of the crucial requirements:

- More land must be protected.¹
- Land use must be prescribed on very large spatial scales.²
- Management practices must be reformed.³
- Top carnivores will have to be restored in many places where they have been extirpated.⁴
- Alien species must be combatted as a matter of public policy.⁵
- Disturbed and degraded habitats must be made more natural.⁶
- Free run must be given to physical processes, such as wildfires and floods, that rejuvenate plant communities and shape the landscape.⁷

The vision propounded throughout this book [*Continental Conservation*] is the goal of bringing wildness back to North America by healing the wounds of past excesses and indifference. A more specific objective is to ensure the persistence of all native species by providing ecological conditions that will sustain them indefinitely. Some will dismiss this vision as impossible, a flight of fancy, too idealistic. But the framers of the US Constitution were remarkably idealistic. What we propose is neither impossible nor impractical. The restoration of wild Nature in North America is not a flight of fancy. If the people so desire, and act according to that desire, it can happen.

The natural world—our only home—is being mistreated, and conservation biologists have developed a growing body of information, insight, and strategies for helping lands and waters regain ecological health. Here we describe what it will take. On the social side, the key ingredient is people who are not afraid to dream of a better world. The rest is science—and that is the easy part, even if there are questions still to be answered. At the heart of the science is restoration of the abiotic and biotic processes that sustained biodiversity over the millennia prior to the advent of humans.

The leading abiotic processes essential to maintaining biodiversity are unrestrained fire and flood regimes. Modern forestry practices include widespread fire suppression or use of fire in a carefully controlled manner to limit hardwood regen-

eration in pine stands. Since fire-dependent plant communities disappear under these conditions, fire regimes that mimic the frequencies and intensities prevalent in presettlement times will need to be reinstated. Similarly, prairies resembling those found by the pioneers can be recreated only by restocking native herbivore assemblages and allowing wildfires to open thick grass swards to colonization of native forbs and other species. Restoring natural flows to rivers will entail the removal of dams, dikes, and other water control structures accompanied by efforts to reduce silt loads and pollution. The Kissimmee River in Florida is already undergoing an extensive (and expensive) restoration in recognition of past mistakes. Restoration of other rivers is under discussion or in the planning stage.

Among the essential biotic processes that regulate biodiversity are species interactions such as predation, pollination, parasitism, seed dispersal, seed predation, and herbivory. When these processes veer out of their "normal" ranges in response to fragmentation, habitat degradation, exotic species, and the absence of key members of the native fauna, a cascade of biological effects is unleashed—leading to what are termed "secondary extinctions." The challenge of restoring all these processes to their presettlement states presents a serious scientific problem. Nevertheless, there is abundant evidence to support the notion that top-down regulation is essential to stabilizing biotic interactions. Top-down forces are those exerted by species at one trophic level on those at the next lower level: effects of predators on herbivores, for example, or herbivores on plants. Where some or all of the large carnivores have been extirpated (in more than 90% of the Lower 48 states), top-down forces have been drastically weakened. The consequence has been widespread irruptions of herbivores, which can alter vegetative communities, and of "mesopredators" such as foxes, raccoons, and opossums—species whose numbers were once maintained at lower levels by larger predators. In the absence of large predators, some of these smaller animals have become potent agents of secondary extinction. Reintroduction of native predators, therefore, must stand at the top of the agenda in any effort to promote the recovery of partially degraded ecosystems.

Restoration of natural abiotic and biotic process regimes will also take lots of land—perhaps 30–40% of the national

1 See Chapter 5 (Core Areas)

2 See Chapter 2 (Considering Scale in the Identification, Selection, and Design of Biological Reserves)

3 See Chapter 6 (Reconnecting Fragmented Landscapes) and Chapter 7 (Buffer Zones: The Benefits and the Dangers of Compatible Stewardship)

4 See Chapter 3 (Role of Top Carnivores in Regulating Terrestrial Ecosystems)

5 See Chapter 4 (Regional and Continental Conservation)

6 See Chapter 4 (Regional and Continental Conservation)

7 See Chapter 2 (Considering Scale in the Identification, Selection, and Design of Biological Reserves)

territories of the United States and Canada. Such a figure may sound preposterous. But, in fact, it is realistic both scientifically and socially. This is because much of the needed land is already in the public sector. Consider the United States. Roughly 40% of the national territory is public land, most of it federal, excluding reservation lands of Native Americans. If federal and state land-management policies could be made more compatible with biodiversity conservation, much of the national estate could eventually be incorporated into either core protected areas or buffers. It is a matter of persuading politicians to expand current roadless and Wilderness areas and then restoring the connections between them.

We hasten to stress that creating networks of reserves out of large tracts of public land does not imply "locking up" natural resources. The resources of reserves can still be used (except in core areas). What must change are management practices. Today many public lands are being abused for the benefit of the few at the expense of the many. Will the public continue to stand passively by while federal, provincial, and state agencies continue to authorize mining operations near National Parks, overgrazing of public lands, clearcutting of steep slopes, below-cost logging on public lands, destruction of trout and salmon streams, poisoning of prairie dogs, draining of wetlands, and a myriad of other environmental atrocities? Or will the citizens of North America finally wake up and see what is being done to the natural beauty of the land and its precious resources? Our current policies are anachronisms—vestiges of an outmoded frontier mentality. They favor short-term gain over long-term prosperity and are despoiling America the Beautiful.

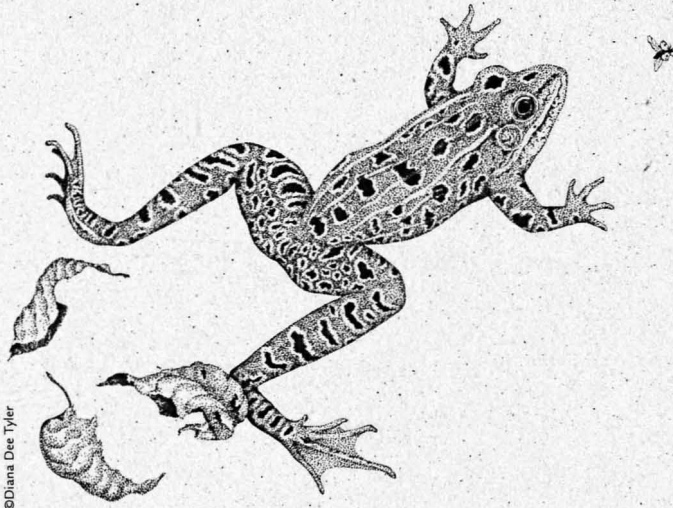
REFORMING LAND-MANAGEMENT policies of federal, state, and provincial agencies is only one route to attaining the vision of a restored wild America. There are, in addition, abundant opportunities for private initiatives. Wildlands are for sale, for example, in northern Maine. And there is money to buy them. The current economic boom has generated trillions of dollars of wealth concentrated in the hands of a few. Over the last several decades, individuals and foundations have collectively purchased millions of acres in the United States and elsewhere. Doug Tompkins, to cite one example, is helping to create a major new National Park in Chile to preserve old-growth alerce trees, the redwoods of the Southern Hemisphere. Ted Turner is buying land for the protection of Nature in Argentina and the United States, as well. Private philanthropy holds the possibility for establishing core areas and key corridors in ecosystems not well represented in public landholdings.

There is nothing new in principle about the idea of reserve networks. The components already exist in the United States, Canada, and elsewhere. Our definition of a reserve network is a land management unit large enough to contain viable populations (at least several hundred individuals) of all native species. In the Rocky Mountains, grizzly bears and wolverines would set the minimum; in other parts of the country it might be wolves or pumas. The absolute size of reserve networks will vary. What is important is that native species have the space and conditions they need to survive over the long run.

Reserve networks will be designed around core wilderness areas afforded the highest level of protection, where mechanized and extractive activities are excluded. The last and best remaining examples of unspoiled North America should be preserved in cores. Recovered areas will have to serve where large tracts of pristine habitat no longer exist. Many core areas can be designated around existing Wilderness in National Parks, National Forests, Crown lands, BLM lands, military reservations, state parks, Nature Conservancy holdings, or private reserves.

Cores will be protected by "buffer zones"—areas to which less stringent conservation criteria apply. Many public lands managed for multiple use can serve as buffers. The purpose of buffers is to shield cores from pernicious external influences, such as alien species, and to expand the area of habitat available to species tolerant of some subsistence or commercial activities, such as light grazing or selective logging. Full implementation of reserves will require reforms in timber and grazing management policies, but such reforms will have to emerge from the political arena and may take time. This is not to say that current policies, however defective, should be an excuse for delay in planning and implementing reserve networks.

Corridors, or habitat linkages, form the third and last architectural component of reserve networks, linking cores and buffers to one another. The point of corridors is to maintain or restore functional connectivity: to provide thoroughfares for the mobile elements of Nature so that separate cores and buffers do not become demographic and genetic islands. Corridors may be many things. They might be private ranches with conservation easements, say, to fill the gaps between National Forests and other public lands, so that grizzlies and wolves may enjoy safe passage between secure redoubts. An abandoned railroad right-of-way, given over to Nature, could make a corridor. In the East, even a mosaic of fields and woodlots might serve for the safe passage of certain wide-ranging species. Safe passage is an important criterion in corridor design, so interstate highways and other such impermeable



barriers should be avoided or made porous by constructing underpasses, as has been done in Florida, for example, to facilitate movements of Florida panthers.

Corridors are of special importance for the larger members of our fauna. Large animals tend to be rare and often move greater distances than smaller fauna. A single wolf pack may use hundreds of square kilometers, for example, perhaps the size of an entire core. But a wolf pack has only one breeding male and female, so genetically it is but a single pair. So that young wolves may reproduce without inbreeding, they must be able to disperse to the territory of the next pack to find potential mates. To do this, they need corridors through which they can travel without undue risk of meeting trigger-happy hunters, irate shepherders, or death under an 18-wheeler on the interstate.

Corridors are a new concept in conservation biology, and in many respects they are untested. We know, for example, that young wolves have to move to find mates, often over large distances. But we don't know enough about how they move and what kinds of places they prefer or avoid. Several species of large mammals are being studied with radio collars to find out more about their wanderings and what habitats they use at different seasons. Elk migrate seasonally between their high-country summer quarters and valley-floor winter ranges. Many, but not all, elk migrations take place entirely within federal lands in the West. Where elk have to cross private lands, fences and highways can be barriers or sources of mortality. Landowner incentives already exist to reduce such conflicts, and more will be needed.

Smaller creatures may need or require corridors, too, but on smaller scales. Aquatic turtles are at risk when they have to cross roads in search of nesting sites. Some species of snakes concentrate at dens for the winter and then fan out over thousands of hectares during the summer before returning to the den in the fall. Roads are unkind to snakes, too. Many butter-

flies fly in reference to landmarks, following hedgerows, streams, or forest edges from one patch of suitable habitat to another. Many frogs and some salamanders migrate seasonally to breeding ponds, dispersing widely at other times. The needs of all these animals, and many others, could be served by appropriately designing the landscape.

When we say "appropriately designing the landscape," we are not imagining an elaborate set of regulations and a vast bureaucracy to administer them. We are imagining a more eco-friendly society, one that has made an ethical decision to protect Nature. Farmers could express their sympathy for wildlife by reestablishing the hedgerows that were so prevalent fifty years ago. Some ranchers already contribute by restricting access of their cattle to riparian corridors and by taking a more relaxed attitude toward large carnivores. Timber companies could do their part by generally adopting uneven-age management and by sparing den trees and snags. And highway departments could reduce the carnage of roadkills by fencing rights-of-way, building animal underpasses, and avoiding the use of solid concrete barriers to separate oncoming lanes of traffic. Few of these measures would detract significantly from the income of farmers, ranchers, or loggers, or add noticeably to the burden of taxpayers.

Policies to protect watersheds and stream corridors benefit both people and living Nature. Preliminary steps toward such policies have been taken in parts of the United States for the purpose of improving water quality. In the Chesapeake Bay watershed, for example, building permits are not issued for construction in floodplains of permanent streams. These and other associated regulations, codified in a tri-state agreement, have resulted in notably cleaner tributaries and a cleaner, more productive bay. But in other parts of the country, clearcuts, cattle pastures, cultivated fields, housing developments, and parking lots extend to the very rims of streambanks, so that contaminated runoff drains directly into aquatic habitats and into the water supply. Does anyone really want to drink water that has drained off a cattle pasture, golf course, or industrial complex? Improved management of stream corridors will come about through public pressure and civic action, quite independently of any value that stream corridors may have for wildlife.

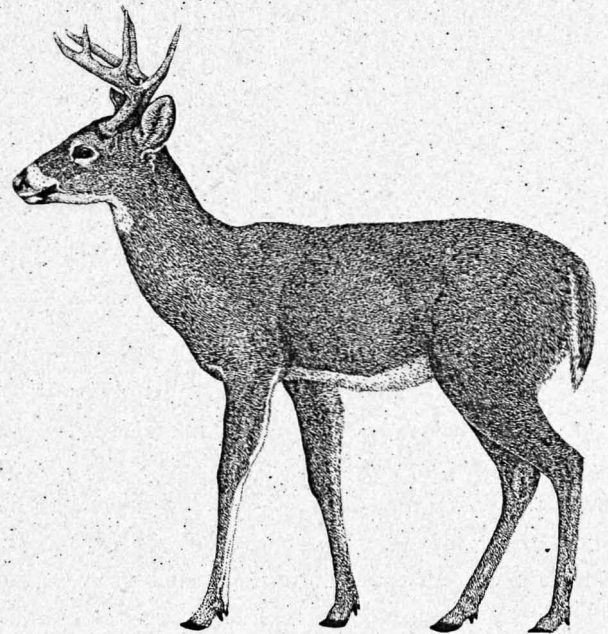
Proper protection of watersheds, stream corridors, and associated wetlands could yield major ancillary benefits to wildlife. Floodplains and wetlands are the most productive elements of the landscape, supporting higher densities of most groups of animals than drought-prone uplands. Stream valleys are natural biological connectors used by aquatic and

terrestrial forms alike to move from one part of a landscape to another. The inherently dendritic form of drainage patterns ensures interconnectedness throughout a watershed as well as wide mobility to creatures traveling in or along streams. More enlightened policies toward streams and watersheds could go far toward creating movement corridors for animals and the needed interconnectedness on a landscape-watershed level. Connectivity between watersheds to ensure passage of migratory, nomadic, and wide-ranging species is an important feature of reserve design. Additional needs for interconnectedness could be met on a case-by-case basis as the large-scale movements of animals are better understood.

Coda

More than a century ago, our forebears completed the conquest of the frontier. For a century and more before that, they waged war against wild America so successfully that they almost extinguished it. Mop-up operations against Nature have characterized the 20th century. Now we are seeing the folly in these past excesses. The loss of wild America diminishes our quality of life. How many of us would be pleased to live in a land without songbirds? In a land without wildflowers? In a land without majestic forests and windswept prairies? Wild Nature is worth having because it enriches our lives and nourishes our psyches.

Continental Conservation describes how the restoration of wild America can be accomplished through the establishment of a continental system of reserve networks constructed of cores, buffers, and corridors. Reserve networks can be designed in the far North using existing wildlands without the need for major biological restoration. Elsewhere—that is, over most of the continent—wildlands will have to be recreated through a program of adaptive management. The goal is to restore, over large portions of the continent, the abiotic and biotic processes that sustain biodiversity. Essential processes include fire and flooding that shape the physical environment, predation, movements such as migration and dispersal, and others that define the interactions between plants and animals. This restoration implies not merely the qualitative reestablishment of such processes, but the quantitative reinstatement of the homeostatic mechanisms that stabilize natural biotic communities and help them resist invasion by exotics. The recovery of the North American continent (except for parts of northern Canada and Alaska) thus presents major challenges, but challenges that fall largely within current scientific capability. Beyond science, what we need most is the political will to succeed in an exciting venture that will ensure a better future for all. ♻



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Canada's Great Bear Rainforest *at Risk*

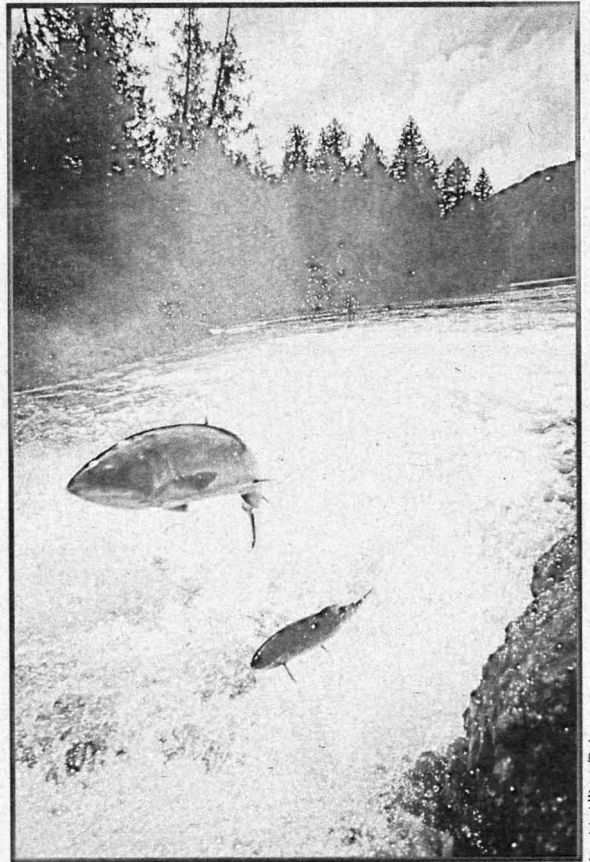
by Christopher Genovali

The Great Bear Rainforest on British Columbia's mainland coast encompasses more than three million hectares of intact coastal rainforest wilderness, yet just seven percent of this land base comprises the salmon-rich river valley bottoms that are the biological heart of the region. These river valleys contain what is likely the greatest extent of productive ancient temperate rainforest left on the planet.

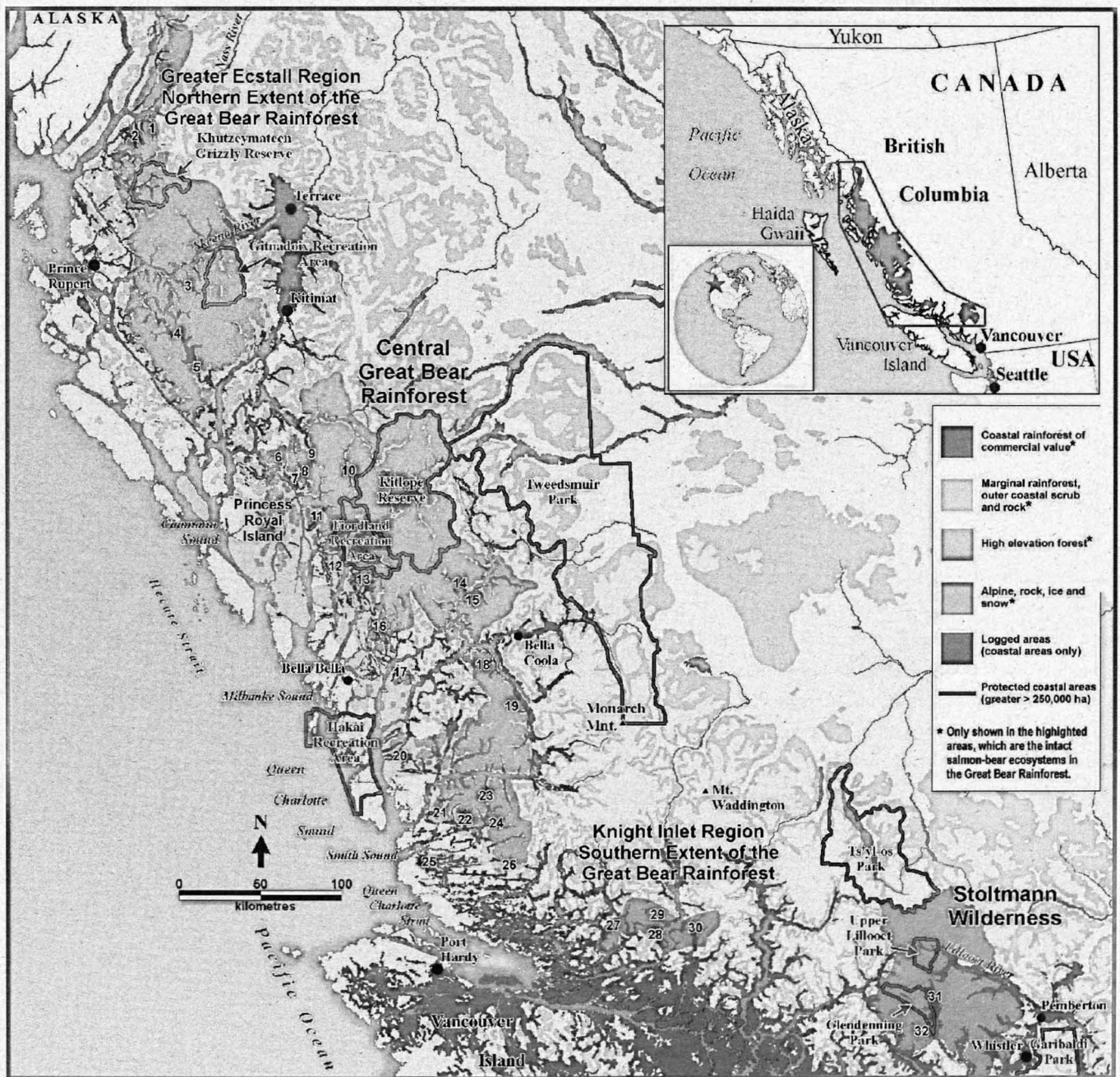
The river valleys provide habitat for wild salmon, coastal grizzly bears, spirit bears (a rare white phase of the coastal black bear), black bears, Bald Eagles, wolves, and a host of other wildlife. The timber industry covets the river valleys for their productive lowland forests. Since 1990, 32 rainforest valleys on the mainland coast have been roaded and logged. Since September of 1997, logging roads have been punched into 13 intact valleys. More than four wild river valleys per year have been severely impacted by industrial logging. Western Forest Products (WFP) is planning to clearcut eight intact river valleys in the central coast region of the Great Bear Rainforest alone. As a measure of its liquidation logging agenda, WFP has applied to clearcut 23 separate cut blocks in the spectacular James Bay watershed on Pooley Island, an area which the Raincoast Conservation Society believes may have the highest density of wolves on the continent.

Wild salmon are the most important keystone species for coastal rainforest ecosystems and are an important food source for a wide array of wildlife. Grizzly bears depend on healthy salmon runs for their survival. Recent research suggests that even the ancient temperate rainforests on the coast are dependent on salmon. Bears drag the carcasses of spawned-out salmon into the forest, facilitating a major upslope nitrogen transfer into the forest soil.

The current forest policies of Premier Glen Clark's NDP (New Democratic Party) government will guarantee the destruction of critical salmon habitat. In light of Clark's so-called salmon war with Alaska and Washington State, it is ironic that salmon-producing systems like the Aaltanhash River, Green Inlet, and Pooley Island (along with virtually every other unprotected intact valley in the Great Bear Rainforest) are being targeted for clearcut logging. An American Fisheries Society scientific report released in the fall of 1996 stated that 142 salmon stocks have gone extinct in BC and the Yukon, and 624 stocks are at high risk due primarily to habitat loss. The ongoing destruction of salmon habitat by clearcutting and road-building, however, has been blatantly ignored by the province because it is an issue that strips bare BC's dirty secret war on its ancient temperate rainforests.



Ian McAllister/Raincoast



A particularly egregious example of the provincial government's lack of commitment to protecting salmon habitat is the degradation of the Johnston Creek watershed, the largest coho producer left in Rivers Inlet. The Johnston has been subjected to road-building and clearcut logging by International Forest Products (Interfor). Interfor plans to bulldoze 16 kilometers of logging roads up the river valley alongside sensitive coho rearing areas in order to clearcut the heart out of the Johnston. The province has issued Interfor approvals for the Johnston without adequate terrain stability studies and other assessments critical to ensuring the protection of salmon habitat. The Johnston has been granted a very temporary reprieve as Interfor has suspended its operations there only until June 1, 1999.

Ninety-seven percent of the timber removed from BC's coastal rainforests is clearcut. The Forest Practices Code, the centerpiece of the government's public relations campaign, perpetuates clearcut logging and plantation forestry, maintains unsustainable cut levels, and fails miserably as a mechanism to protect biodiversity. Early last year the BC government announced an extensive rollback of the already weak regulations in the Code governing timber harvesting. The bottom line is that the Clark government is essentially empowering a rogue timber industry to regulate itself. In addition, Clark has been handing out hundreds of millions of dollars, courtesy of BC taxpayers, in corporate welfare to prop up failing pulp mills while funding for BC's health care and educational systems suffer as a result.

The government has implemented another one of its so-called consensus-based land-use processes—the Land and Resource Management Plan (LRMP)—for the coast. The government, timber industry, Industrial Wood and Allied Workers of Canada, Forest Alliance (the well-heeled industry front group), and SHARE (BC's version of the "wise use" movement) are all mouthing the same "if only the conservation sector would just come to the table" line. But virtually every conservation organization in BC that works on terrestrial forest issues is boycotting the process, as the government's arbitrary 12% provincial cap on park creation precludes adequate protection of coastal rainforest ecosystems. The not-so-hidden agenda of the LRMP process is to quash the momentum of the Great Bear Rainforest campaign, both domestically and internationally.

In 1992, the BC government adopted a policy of capping park creation at 12% of the province's land base. The 12% policy is not legislated; it is not law. It is strictly an arbitrary policy decision. The government plucked this 12% figure from *The Brundtland Report*, which recommended a tripling of protected areas worldwide. Jeffrey McNeeley of the World Conservation Union originally offered the number as a guess on the level of global ecosystem protection that might be politically achievable. The 12% figure is not based on science, and no credible scientist has ever claimed this amount is adequate to protect biodiversity. In the context of BC, 12% protection is not a reasonable or scientifically defensible target given this province's exceptionally diverse ecosystems. And when wide-ranging apex predators such as grizzly bears are a focus of a protected area strategy, expansive protected habitat—in this case, clusters of interconnected river valleys—are necessary to ensure the survival of these large carnivores. The home territory for coastal grizzly bears will range over several different watersheds; these large territories provide the ecological and behavioral options (e.g., accessing seasonal food sources, avoidance of more dominant bears, etc.) coastal grizzlies need to survive.

Unfortunately, the substantive issues surrounding the Great Bear Rainforest—particularly the ongoing destruction of grizzly-salmon ecosystems—have often become a temporary casualty of the government's multimillion dollar public relations efforts. In 1997, Premier Clark and his timber industry allies launched an all-out assault on BC conservationists, stigmatizing them as "enemies of BC" and "economic terrorists." The premier also played the xenophobia card, creating the specter of an "international conspiracy" of environmentalists "funded from abroad" who were bent on "destroying BC." Fostering a lynch mob mentality, Clark exhorted rural communities and forest sector workers to "fight the enemy." As a result of Premier Clark's

politics of fear-mongering, conservationists have been subjected to death threats, physical assaults, and a host of other abuse by timber industry extremists.

The public is gradually beginning to see through the onslaught of government and industry public relations. Recent polling of the BC public conducted by the provincial government has shown huge support for increased wilderness protection. The growing international campaign to protect the Great Bear Rainforest, although still in its nascent stage, aims to reveal the truth about the destruction of BC's coastal forests and protect the extraordinary ecological diversity of this incomparable landscape. ☾

Christopher Genoali lives in Victoria, BC and is on the staff of the Raincoast Conservation Society. He has written about BC's coastal temperate rainforests for many publications including The Ecologist and Earth Island Journal. His last article for Wild Earth was on oil sands development in the boreal forests of northern Alberta.

THE RAINCOAST CONSERVATION SOCIETY

Founded in 1990, the Raincoast Conservation Society is a nonprofit research and public education organization dedicated to the protection of the Great Bear Rainforest. Raincoast's mission is to ensure the long term survival of coastal bears, wild salmon, and the interdependent life forms that define the ancient temperate rainforest. Collecting photographic, video, and scientific evidence and building awareness of these threatened valleys is the foundation of Raincoast's work. Raincoast is extensively involved in conducting and facilitating field research, including the development of a science-based conservation plan for the Great Bear Rainforest. Raincoast has also produced an award winning book—*The Great Bear Rainforest: Canada's Forgotten Coast*, two internationally acclaimed short film documentaries, scientific reports, and other educational literature. To get involved in the Great Bear Rainforest campaign or for more information, contact the Raincoast Conservation Society (POB 8663, Victoria, British Columbia, Canada V8W 3S2; greatbear@raincoast.org; <http://www.raincoast.org>).

Saving the Wind, the Snake, and the Bonnet Plume

Three Wild Northern Rivers

by Ken Madsen
and Juri Peepre

The Peel watershed is a vast northern wilderness that embraces six major tributaries along with many other smaller ones. The Wind, Snake, and Bonnet Plume Rivers—the three easternmost tributaries—are the heart of the watershed. These rivers flow through some of North America's most pristine lands, an area of 32,000 square kilometers that is essentially unroaded. This region, larger than Vancouver Island, is the largest, most intact wilderness in the Yukon south of the Arctic Circle.

A century ago, intact ecosystems were taken for granted in Canada. Now they are rare jewels in an increasingly fragmented landscape. This characteristic alone makes the Peel watershed worthy of protection, but the region has many notable features: it is home to wintering barren-ground caribou, a newly reestablished population of breeding Peregrine Falcons, rare and range-extending plants, dinosaur bones, and relict fish populations.

Large predators such as grizzly bears, wolves, and wolverines—considered indicators of ecosystem health—live in the watershed in healthy populations. These wide-ranging predators are wilderness-dependent, needing large, intact ecosystems safe from human encroachment in order to survive. Conservationists often refer to them as “umbrella species.” If we have the foresight to protect enough land for their needs, then under the “umbrella” of their protection, the habitat requirements of most other species will also be met.

This land is the traditional territory of two First Nations, the Tetlit Gwich'in and the Nacho N'yak Dun. One Gwich'in name for the Bonnet Plume expresses their feelings about the health and bounty of the land. The literal translation of “Tsaih Tl'ak Njik” is “bright ochre creek,” but many Gwich'in refer to the watershed as “the place where life was good.”

The Tetlit Gwich'in now live downstream on the Peel, near Fort McPherson, Northwest Territories. They still depend upon the health of the ecosystem and the clean waters of the river. They hunt along the river and fish in its waters. For the Gwich'in, living off the land is more than subsistence economy, it is the basis of their culture.

Moreover, this extraordinary wilderness is the northern anchor of the Yellowstone to Yukon Conservation Initiative (Y2Y), a vision and strategy for maintaining healthy wildlands through the wild heart of North America, the nearly 3000 contiguous kilometers of the Rocky, Columbia, and Mackenzie Mountains, all the way from Yellowstone through the Yukon. Protecting the unique Peel watershed is a definitive step toward making this vision a reality.



Ken Madsen

This excerpt is from The Wind, the Snake, and the Bonnet Plume: Three Wild Northern Rivers, co-published by the Friends of the Yukon Rivers and the Yukon Chapter of the Canadian Parks and Wilderness Society (CPAWS) for the Yukon Wildlands Project (30 Dawson Rd., Whitehorse, Yukon Y1A 5T6) and the Endangered Spaces Campaign. The 54-page book may be ordered through CPAWS-Yukon (Box 31095, 211 Main St., Whitehorse, Yukon, Canada Y1A 5P7) for \$12 US; checks and money orders are payable to CPAWS-Yukon.

Mining Activity in the Peel Watershed

It is no secret that the Peel watershed contains minerals as well as wilderness and rich wildlife habitat. Mining companies have explored extensively in this region. For more than 70 years, the "free entry" system has allowed a mining company to hammer two posts into the ground almost anywhere in the Yukon and claim that its economic interests take precedence over other land uses. No other industry or organization has this power. Loggers can't stake a claim and cut trees. Wilderness tourism promoters can't stake a claim and build a fishing lodge. Conservationists can't stake a claim and legally designate a protected area.

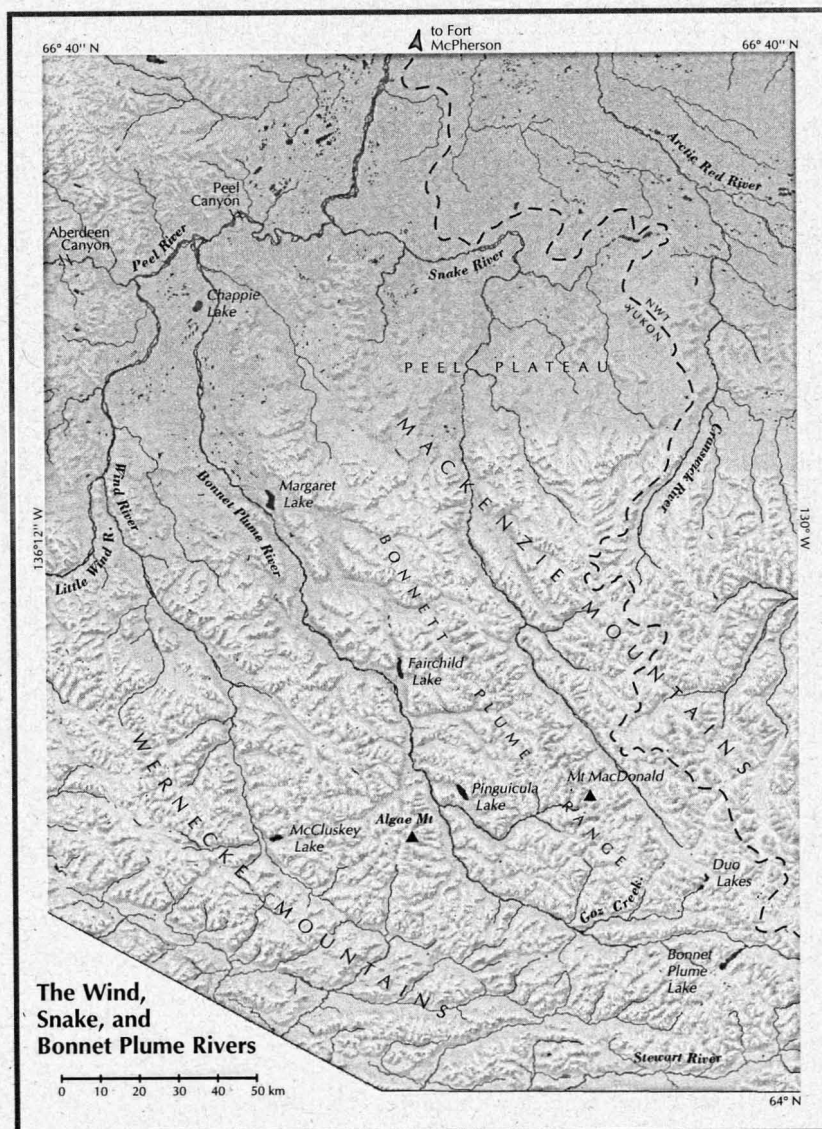
Once their claims are registered, mining companies can cut trees, dig trenches, bulldoze roads, and construct camps and airstrips. Mineral exploration and operating mines threaten wildlife and degrade habitat quality. The health of natural systems as well as other legitimate human activities may be compromised because of this outdated system.

Mining Exploration on the Bonnet Plume River

In the early 1990s, Westmin Resources Limited and other mining companies intensified exploration on the Bonnet Plume River. The companies staked huge areas of interconnected claims. One of the blocks of claims parallels the river for 37 kilometers and encompasses 110 square kilometers.

At the same time that prospectors were pounding claim posts along the Bonnet Plume, the river was being recognized for its natural heritage, cultural significance, and recreational potential. As a part of the Nacho N'yak Dun First Nation's land claim, the Bonnet Plume was nominated as a Canadian Heritage River. Shortly after the nomination, Westmin applied for a permit to move heavy equipment to their claims on the banks of the river. The Department of Indian Affairs and Northern Development (DIAND) authorized the land-use permit without even referring to the Bonnet Plume's pending Heritage River Status.

During the summer of 1996, paddlers visited Westmin's camp beside the Bonnet Plume. The camp was deserted, but airplanes were still using the 1.3 kilometer airstrip that the company had bulldozed near the river. The visitors photographed leaking oil drums, stacks of drilling chemicals torn open by ani-



mals, and an open garbage dump. Westmin reopened the camp for exploration at the start of the 1997 season, but by mid-July they were gone again. This time they stripped the camp, leaving just the shells of the buildings, core samples, and the airstrip.

The Canadian Parks and Wilderness Society (CPAWS), represented by the Sierra Legal Defense Fund, challenged the federal government's interpretation of mining and environmental laws relating to mineral claims along the Bonnet Plume. The Tetlit Gwich'in, who depend upon healthy wildlife habitat and clean water, supported the lawsuit.

CPAWS lost the first round of the legal challenge, but won on one important point. The federal government should have considered the Bonnet Plume's Heritage River nomination before issuing the permit. First Nations and conservation groups are still working on the root of the problem: the antiquated laws that govern mining in the Yukon.

A partial conservation victory did occur on July 18, 1998. The Bonnet Plume was officially designated a Canadian Heritage River. The plan calls on governments to cooperate in

the conservation of the watershed but provides no legal protection from development.

If a major mine is ever built near the Wind, Snake, or Bonnet Plume Rivers, it would likely bring hundreds of kilometers of roads as well as pipelines, tailings ponds, camps, and airfields—and the end of the region's wilderness character.

Conservation Opportunities

Currently there are no true protected areas within the Peel River watershed. The Canadian Heritage River status of the Bonnet Plume River is a cooperative effort between the Nacho N'yak Dun First Nation, the federal government, and the Yukon government. Heritage River designation implies a higher level of care for a wilderness watershed, but has no effective legislative teeth. Genuine future protection for the Bonnet Plume valley will only be possible if territorial parks or other types of protected areas overlap the Heritage River area.

In 1997, the Yukon Territorial Government embarked upon a "Protected Areas Strategy." Among the stated goals of the strategy are protection of representative samples of each of the Yukon's 23 ecoregions as well as wilderness areas and critical wildlife habitat. The goals are derived from the World Wildlife Fund's Endangered Spaces Campaign which the Yukon government endorsed in 1990.

At this time, there is only one pending protected area in either the Mackenzie Mountains ecoregion or the Yukon part of the Peel River Plateau ecoregion. The proposed territorial park in the Tombstone Mountains is in the western extremity of the Mackenzie Mountains ecoregion. Scientific analysis by CPAWS-Yukon and the World Wildlife Fund shows that it would not adequately represent the entire natural region. Despite being located in the same ecoregion, the Tombstone Mountains have distinctive ecological features that are very different from the Wind, Snake, and Bonnet Plume drainages.

Conservation and the Porcupine Caribou Herd

The calving grounds of the Porcupine Caribou Herd are on the Arctic coastal plain in the Yukon and Alaska. The principle calving area is in the Arctic National Wildlife Refuge, most of which is designated Wilderness by the US government, in Alaska. The herd's most important calving area (in the so-called 1002 lands in the Refuge) is not designated Wilderness and is threatened by possible oil exploration and development. Development in the herd's calving grounds could have a profound impact on the entire range.

In Canada, there are two National Parks within the range of

the herd: Ivvavik and Vuntut. The rest of the winter range is unprotected, and incremental development threatens to chip away at lands that are still wild and healthy. Northern Cross, an oil company, is proposing gas development in the Eagle Plains. Industrial mining or roads in the Peel River watershed would compromise the herd's winter range, and set a dangerous precedent. How can we ask the Americans to protect the calving grounds if we are not willing to make sure the Canadian portion of the "Caribou Commons" remains healthy?

The Gwich'in and other aboriginal people have steadfastly opposed harmful development within the Caribou range. The Vuntut Gwich'in First Nation supports permanent protection of the 1002 lands and has declared a development moratorium on all their lands to ensure the continuing health of the herd.

Protected Areas in the Peel Watershed Are Needed

Studies conducted by the Yukon Wildlands Project show the need to conserve wildlife habitat and wilderness values throughout the region. The Wind, Snake, and Bonnet Plume watersheds form an intact ecosystem that has international significance. The area has virtually no development, no roads, and has been lightly hunted compared to other Yukon regions. In this section of the Peel watershed, intrusive wildlife management hasn't adversely affected prey species such as the Bonnet Plume Caribou Herd, or predators such as wolves.

CPAWS research has showed that the habitat in this part of the northern Yukon supports medium to low densities of grizzly bears. The densities of other carnivores that inhabit these watersheds, including wolves and wolverines, have not been studied. Protected areas should act as "carnivore conservation areas," with buffer zones to ensure that inappropriate development doesn't adversely affect these wilderness-dependent species. It is critical to protect enough habitat for the Bonnet Plume Caribou Herd as well as winter range for the Porcupine Caribou Herd.

Northern Canada has more than 20% of the world's remaining wilderness—a precious and dwindling source of life, inspiration, and hope for the future. Governments (including First Nations), Renewable Resource Councils, and conservation groups are among the many organizations that will help shape protected areas in the Peel watershed. The Yukon land claim agreement and the territorial Protected Areas Strategy provide many of the important building blocks. Most important, we need to embrace the Y2Y vision for conservation that will protect the full variety of species, large expanses of intact wilderness, wildlife habitat, birthing grounds, and movement routes, as well as watershed health and our northern way of life. C

A Second Life for Dead Trees

Roads, Fragmentation, and the Loss of Wildlife Habitat in Northern New Mexico

by *Bryan M. Bird*

When conditions are favorable, a long, narrow strand of mountains straddling the Colorado-New Mexico border glows deep red as though bathed in the blood of Christ. Long before the Spaniards arrived in the region, approximately 300 million years ago, major tectonic activity was contributing to the formation of the Sangre de Cristo mountain range. High mountain peaks reaching thirteen and fourteen thousand feet above sea level form the backbone of the range that stretches 200 miles from the Arkansas River in Colorado to Santa Fe, New Mexico. As late as 1827, maps showed no established roads through the Sangre de Cristo (Benedict 1991) but the wildness of these mountains would soon be changed forever by the arrival of the Spanish, French, and Americans.

The Sangre de Cristo Mountains support a diverse spectrum of conifer and aspen forests, from low-elevation pinyon-juniper to subalpine spruce-fir forests, as well as lush riparian ecosystems. Dependent on these various habitats are at least 235 bird species, notably the Northern Goshawk and the Flammulated Owl, 80 mammal species including the wolverine and river otter, and six native fish species such as the Rio Grande and Colorado cutthroat trout. Countless reptile, amphibian, and invertebrate species occupy these diverse forests.

A century and a half of human exploitation has taken its toll on the region's wildlife. Presently, 35 birds, eight mammals, and three fish are listed as Threatened or Endangered by the US Fish and Wildlife Service or by the states of Colorado and New Mexico and/or sensitive by the US Forest Service. Top predators such as the grizzly, wolf, and lynx, which once roamed the isolated reaches of these mountains in search of prey and good denning habitat, are now extirpated.

The Sangre de Cristo Mountains are proposed as part of the greater San Juan-Sangre de Cristo Reserve Network, currently being designed by the Southwest Wildlands Initiative and Forest Guardians of Santa Fe, New Mexico. The relatively pristine state of the area makes it a potential core forest reserve in the larger Wildlands Reserve Network, if fragmentation associated with road-building and other ecological threats can be repelled.



Road Hazards

Timber harvest, fuelwood collection, and off-road vehicle (ORV) use have blanketed the Sangre de Cristo Mountains in a network of roads and trails that jeopardize their integrity and biodiversity. Two interrelated factors continue to place these forest ecosystems at risk. The Forest Service has constructed hundreds of miles of access roads into these National Forests and has failed to adequately close and obliterate those roads—although it is legally responsible for closing and obliterating any unnecessary roadway or area disturbed by road construction on National Forest lands within ten years of the termination of the activity that required its use (National Forest Management Act 1976). There are also miles and miles of undocumented ORV trails that connect the forest road system. The negative impacts of roads on biological integrity include habitat destruction and fragmentation, edge effects, exotic species invasions, pollution, and over-hunting. Reed Noss (1995) has pointed out that roads can be mortality sinks for wildlife, affect animal distribution and movement patterns, fragment populations, increase sedimentation that clogs streams and destroys fisheries, create edge, and serve as access corridors that encourage development, logging, and poaching of rare plants and animals.

The most conspicuous negative effect of roads is the increased access they provide humans. This factor has several consequences including the increased removal of trees, in particular snags for firewood, and the increased potential for human-caused wildfires. Thus the second, and no less destabilizing factor that places the forest ecosystem at risk, is a scarcity of snags (standing dead trees), resulting from high road densities and the consequent human access they provide.

Snags are indispensable habitat in coniferous and aspen forests for birds that nest in cavities and other wildlife. Removal of snags on commercial timber sales and for fuelwood has been linked to declines in both the diversity and the number of birds in southwestern forests (Cunningham et al. 1980). The number of snags in an area is a good predictor of cavity-nesting bird densities (Brawn and Balda 1983) and those bird populations perform a significant function in reducing harmful insect populations (Scott 1978). Generally speaking, birds depend on snags for three activities: nesting, foraging, or perching. Large snags, 24 inches diameter or greater (USDA 1985), and those retaining more than 40% of their bark (Scott 1978) are utilized more often by cavity-nesting birds. The reasons for the preferential use of larger snags by cavity-nesting birds include better insulation, larger cavities, and greater longevity, all of which contribute to nestling survival rates (Karlsson and Nilsson 1977). There are numerous species of concern in the Southwest that are ecologi-

cally dependent upon snags, including the federally listed Bald Eagle, Northern Goshawk, and Mexican Spotted Owl. Snags play a critical role for as many as 85 species of North American birds (Noss 1995) and 49 mammal species (Davis 1983), including a number of bats. Also, many reptiles, amphibians, and invertebrates use snags (Davis 1983).

In addition to the direct effects on wildlife populations, another consequence of increased human use is related to wild-fire frequency and seasonality. Most wildfires—as many as 90%—are caused by humans, and over half start from roadsides (Noss 1995). Finally, roads directly affect hydrology and aquatic habitats. Changes in water quantity and quality, stream channel morphology (shape), and ground water levels are some examples. Erosion and sedimentation from roads is arguably the most damaging effect: Increased erosion in turn increases sedimentation in downstream watersheds. Studies in Idaho found that erosion from logging roads was 220 times greater than on undisturbed sites (Noss 1995).

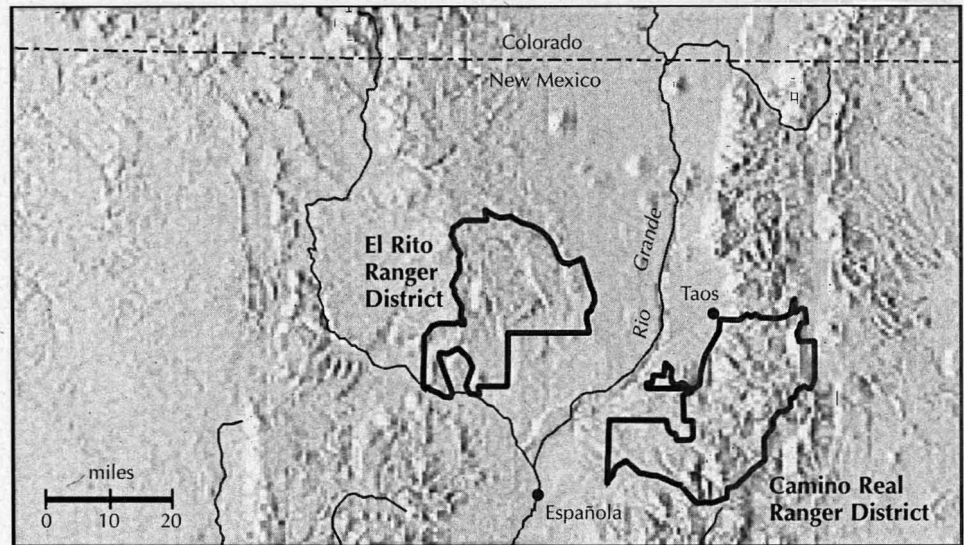
The Forest Service is currently accountable for at least 440,000 miles of roads. This figure represents only those roads officially surveyed by the Forest Service; many more miles of undocumented roads exist on National Forest lands. Keith Hammer has shown that Forest Service road density calculations are inherently underestimated because of two false assumptions: that road closures are effective and mitigate any deleterious effects upon wildlife, and that all existing roads on Forest Service land are inventoried and included on Forest Service maps and computer inventories. There is a wealth of data that contradicts these assumptions (USFS 1992, USFS 1993, USFS 1986, Hammer 1986).

Collecting the Evidence

Scientifically defensible data are not limited to academia and can be a significant component of the conservation strategies, plans, or alternatives of activist organizations. Forest Guardians commissioned a study to collect information to bolster our campaign to close roads and protect wildlife habitat in northern New Mexico's public forests. Our research confirmed that the Forest Service is maintaining a road density that is higher than most acceptable standards for wildlife and that there are an abundance of ineffective road closures. This information was gathered from two Ranger Districts on the Carson National Forest in the Sangre de Cristo Mountains of northern New Mexico (see map).

Forest activists will require substantial evidence when challenging excessive and damaging road networks on public lands if their appeals are to meet with success. Here in the Sangre de Cristo Mountains, we used the methodology described

Carson National Forest Ranger Districts encompassing Study Area



by Keith Hammer in *The Road Ripper's Guide to the National Forests* and Forest Service transportation and recreation maps to assess road density. All roads classified as open, closed, and obliterated were measured. We carried out road closure surveys on the ground and measured snags and their characteristics on 145 plots in mixed conifer and ponderosa pine forest.

In our study area of 625 square miles, temporary roads made up 87% or 1189 miles of the total roads. Temporary roads are those most often left in place after timbering operations and are responsible for the spider web effect on the landscape. Ninety-two miles of allegedly closed roads and 302 miles of allegedly obliterated roads were measured on the transportation maps. There was a total of 1362 miles of open roads in the area studied, which translates into an overall road density of 2.2 mi/mi². This road density is nearly three times the density at which black bear are negatively affected and more than double the value at which elk habitat effectiveness falls to 60%.

Twenty-two closed or obliterated roads were surveyed to determine their status and many showed signs of current use. In this area, the Forest Service is maintaining roughly 64% closure effectiveness. The most common procedure for road closure is the construction of earth berms. This method of closing roads is largely ineffective, particularly in ponderosa pine forests where the open stand structure yields uncomplicated passage. A frequent means of entry into closed or obliterated roads is by detour; vandalism also plays a role in illegal entry of closed or obliterated roads.

Where are the dead trees?

A measurable effect of high road density is the paucity of snags and other fuelwood such as downed logs. The federally owned forests of the Sangre de Cristo presently maintain an exception-

ally low density of snags. The number of snags per acre ranged from 0 to 8 with an average of 1.5 in two forest districts and forest types surveyed. Only 22% of the study plots met the National Forest guideline of three snags per acre. For comparison, snag densities (>10 inches in diameter) in unmanaged, closed canopy ponderosa pine forests and mixed conifer forests in Idaho ranged from 4.8 to 48 per acre, respectively (Bull et al. 1997). In addition, snag density can be predicted from habitat type and percent slope: snags in ponderosa pine forests and on less steep slopes generally are more accessible to humans and thus more likely to be exploited by firewood cutters.

The average diameter of snags greater than 12 inches at breast height (the most widely accepted definition of a snag) was 18.1 and the largest measured was 40 inches. Seventy-one percent of all inventoried dead trees were under 12 inches diameter. This scarcity of snags in the study area, compounded by the small size of those remaining, endangers the cavity-nesting bird population in the Sangre de Cristo Mountains. Because numerous cavity-nesting birds are insectivorous, the insufficient presence of such an important habitat component virtually guarantees their decline in density and diversity, which in turn leads to potentially unnatural increases in forest insect populations (Scott 1978). Not only is the long-term population viability of these species at risk, but so is the health of the entire forest ecosystem.

Road Work

The distance to the nearest road can predict snag density—an important fact that can be attributed to current and historical factors. The density of roads in our study area is very high; these roads currently provide access to forested areas that firewood collectors, hunters, and ORVs would not regularly utilize.

The people of northern New Mexico have traditionally heated their adobe homes with wood and because of the rural character of the region, they have not had access to utilities. Growing human populations that depend upon firewood (rather than solar, electric, or natural gas) combined with weak fuelwood regulations on National Forest lands has resulted in acute pressure on local forests.

In addition, fire prevention practices, safety concerns, and a lack of ecological information has led the USFS to systematically remove standing dead trees from their lands (Goodwin and Balda 1983). During field research we witnessed stands of otherwise healthy, mature forest with evidence that every last snag had been cut down and left in place as a fire prevention strategy. Archaic management practices such as this are unfortunately still in evidence in many areas: for example, the Gila National Forest in southwestern New Mexico last year felled a number of large, old snags in an attempt to contain a wildfire within the Wilderness boundary.

Unnecessary road networks and the conspicuous absence of large snags in the Sangre de Cristo Mountains jeopardize the survival of cavity-nesting birds and other wildlife that use snags. The excessive fragmentation in this bioregion and others that support coniferous forests is destabilizing ecosystems and the processes that maintain them. Because the federal land management agencies conduct surveys on a project level basis only and not across their management territories, it has become the responsibility of activists and conservationists to do so. It is especially important that existing road densities be monitored and documented in areas targeted in the Wildlands Reserve Network if they are to maintain the characteristics that qualify them for inclusion. Areas designated as critical habitat for sensitive species such as Goshawk, Spotted Owl, grizzly, wolf, and lynx should also be targets for road research.

The Forest Service has standards and guidelines for the allowable density of roads in wildlife prescription areas; it is critical that it be held accountable. When the agencies are not complying with the law, clear evidence such as presented above can be produced to document the violations and petition for the closure and obliteration of roads on public lands. A copy of survey results and a strong letter asking the forest supervisor or equivalent land manager to close the roads that are in violation should be submitted. If the responsible official takes no action or the decision is arbitrary and capricious under the Administrative Procedures Act, then stronger tactics must be employed. Contact a local environmental law center and ask for their advice and help in forcing the Forest Service to take the appropriate action. More important yet, activists must call for an

end to commercial logging and road-building on the nation's federal public lands and advocate for non-commercial restoration. This strategy will address the root causes of the biodiversity crisis on National Forests and maintain their potential for inclusion in ecological reserve networks. ☺

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Eastern Old-Growth Symposium



The Old-Growth Definitions Symposium held November 6–7, 1998, at Harvard Forest in Petersham, Massachusetts, did not result in a consensus on how to define eastern old growth, but it did demonstrate two significant and encouraging trends among researchers:

- a tendency to expand the old-growth concept to embrace natural disturbance and to include highly diverse types of ecosystems; and
- a tendency to become involved directly in ancient forest preservation.

That definitions of eastern old growth are moving beyond the traditional concept of big, old trees was reflected first in the welcoming speech by David Foster of Harvard Forest, who noted that four forests with which that institution has been associated expand and challenge our understanding of old growth, “virgin forest,” and natural processes. Among the four is the Harvard Tract of Pisgah State Forest in New Hampshire, never logged but severely damaged by a hurricane. Rebecca Sharitz of the University of Georgia described the bottomland hardwoods of the Congaree swamp in South Carolina as a disturbance-driven system: the large oaks and sweet-gum that dominate the canopy at the Congaree are shade intolerant and successfully reproduce only when natural disturbances such as hurricanes open the canopy. Thus, these types of natural communities should be taken into account in developing an old-growth definition. Peter Kelly of Guelph University, speaking for Douglas Larson and himself, asked that definitions be expanded to include cliff habitats with small but ancient trees such as the northern white-cedar on the Niagara Escarpment. Sara Webb, discussing jack pine in Minnesota, asked how we can define forests that possess integrity but in which the trees are young. Will Blozan stretched our understanding of old growth in the classic sense with his slides of the giant, old trees in Great Smoky Mountains National Park.

In outlining the reasons and need for the meeting, organizer of the Definitions Symposium Robert Leverett called attention to the question of preservation. Old-growth researchers and advocates are emphasizing definitions and conferences because we do not want old-growth forests to slip away. We also realize that we cannot understand or protect them without community effort. Susan Andrew, of the Southern Appalachian Forest Coalition, and Peter Quinby, consultant to

A Defining Moment in Old-Growth Research and Preservation

by Mary Davis

A WILDERNESS FOR ERNIE

In 1986 Virginians for Wilderness proposed a 65,000-acre Shenandoah Wilderness for the George Washington National Forest. Although this Wilderness was never designated, the proposal received considerable publicity in the media and was supported by The Wilderness Society.

This extraordinary landscape still deserves protection, and it would be fitting to honor the late Ernie Dickerman's extraordinary efforts on behalf of wilderness and wildlife by naming it the Ernie Dickerman Wilderness.

Ernie, who is often called the "grandfather of eastern Wilderness," was a charter member of The Wilderness Society who worked tenaciously to protect eastern wildlands from the 1930s until his death last year. Other Wilderness Society founders, namely Bob Marshall and Aldo Leopold, have had large western Wilderness Areas named after them. Ernie deserves no less to commemorate his lifetime commitment to the National Wilderness Preservation System.

The Ernie Dickerman Wilderness would be the largest National Forest Wilderness east of the Mississippi, containing features of outstanding ecological significance such as old-growth forest and many rare and disjunct species [see "Central Appalachian Wilderness in Perspective," *Wild Earth* 1(3), fall 1991]. It would provide remote wildlife habitat and opportunities for solitude, which are rare in the East. And it is an area Ernie loved and worked hard to preserve in the later years of his life, near the home place where he died. Creation of an Ernie Dickerman Wilderness Area in his beloved Virginia mountains would be an apt tribute to this true American conservation hero.

For more information contact Bob Mueller, Virginians for Wilderness, Route 1, Box 250, Staunton, VA 24401; 540-885-6983.

Earthroots, spoke of their efforts as scientists to help nonprofit organizations protect old growth. If environmentalists and the US Forest Service cannot come to an agreement on definitions, Andrew said, conservationists may simply have to point to an example of old growth and say, "If a forest looks like this, we'll object to any plans to log it."

During the panel discussion, Peter Uhlig of the Ontario Ministry of Natural Resources noted that we cannot preserve old growth by putting a box around it. We must ensure that the ecological processes that create and shape old growth continue

across the landscape, maintaining the functionality of extant old-growth sites. Rebecca Sharitz, thinking of off-site disruptions that harm the hydrology of swamps, agreed that we must take a landscape perspective.

A group of talks about known and potential old-growth indicators underlined the fact that old growth is ecologically irreplaceable and therefore in need of preservation. Henry Art of Williams College made this point explicit: in Williamstown, Massachusetts, woods that have been in existence since at least 1830 have a richer herbaceous layer than do woods growing on land that was once fields. Recolonization of the depauperate woods will require many hundreds of years, especially for plants dispersed by ants. Thus it is critical to preserve remaining old forests and the adjacent woods.

The connection between the themes of definitions and of preservation was obvious to symposium participants who visited the old growth on Mount Wachusett in Massachusetts. The site, which is on the upper slopes, includes a narrow strip of red spruce circling the summit, a hemlock-dominated stand, a very steep and rocky talus, and an area along Indian Trail where red oak, beech, and maple are prominent. In describing the old growth, David Orwig of Harvard Forest pointed out that Dr. Fisher, who founded Harvard Forest, surveyed Mount Wachusett in the early 1900s and found the forest "very scrubby" and of little value. Researchers overlooked the old growth on the mountain—due in part to the traditional association of old growth with statuesque trees—until the summer of 1995, when the team of Peter Dunwiddie and Robert Leverett confirmed its presence.

The old growth on Mount Wachusett became a conservation issue as soon as it was discovered because the state rents the mountain to a company that operates and wants to expand a ski area on it. The degree of protection that the state affords the ancient forest remnant will depend on the definition of old growth that the state adopts. Massachusetts was selected as the site of the symposium largely to draw the attention of state officials and other residents to the value of the Mount Wachusett old growth. After the conference, the publication of a front-page article on old growth in a Sunday edition of the *Boston Globe* underlined the value of this strategy, but the final indication of whether the public truly understands the value of ancient forest ecosystems will be the fate of the state's old-growth sites. ☐

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Population Growth, Agriculture, and the Changing American West

by George Wuerthner

In the extensive reporting on the changing American West there is a bias that almost universally views the loss of agriculture and increasing urbanization as negatives, especially in relation to wildlife and land health. These assumptions deserve examination.

While there has been tremendous population growth in some parts of the West, much of that growth is highly concentrated, and the overall impact on the western landscape has been relatively insignificant. Many media reports on growth are exaggerated; because most of us live in urban areas—and thus feel the negative effects of congestion and growth—there's a tendency to extrapolate and say that if trends continue, the entire West will be one big city.



Our perceptions of growth are skewed when we hear "there's been a 10–20% increase in population in such and such a county." Because the original population is often relatively low to begin with, the consequences may not be as great as the numbers suggest. For example, Park County, Montana, where I live, has had a ten percent increase in population in the past five years, what would seem an alarming rate of growth. Put in perspective, however, that translates to only about a thousand people—a significant increase, but hardly a crisis in a county that covers two million acres. Park County is now home to roughly 14,000 people in an area equivalent to two-thirds of Connecticut, which has 3.2 million people. It will be a long time, if ever, before Park County and most of the West outside a few urban areas even approach the population density found in much of the eastern United States.

Furthermore, often forgotten is that Park County actually had a larger population during the 1920s when agricultural settlement and mining were at their apex. At that time, the county contained 13 towns; today there are four. Cities and towns are generally inhospitable to many native species, to be sure, but most of Park County's population growth is concentrated in these few settlements.

The situation is similar for Montana as a whole. Though we continually hear about how "crowded" Montana is becoming, again we need to put this into perspective. Indeed, some areas around urban centers including Missoula, Bozeman, and Kalispell have grown, but much of the state has lost population. According to recent figures from the Montana Department of Fish, Wildlife and Parks, some 12% of Montana is uninhabited, 82% has less than two people per square mile, and more than 95% of the landscape has less than four people per square mile—qualifying it as "frontier" by the US Census Bureau's definition.

Although Montana's population is more sparse than some other western states, even California—outside its huge urban centers—has a population density over roughly two-thirds of the state that is not much greater than Alaska's. There's still a lot of open space throughout the West.

This is not to suggest that population growth is harmless. Urban areas are definitely more congested, and there is growth in selected rural areas as well. Where rapid growth is occurring, negative effects are real: increased habitat fragmentation from urban sprawl and second-home development in high-amenity rural areas inevitably displace wildlife, pollute watersheds, and disrupt ecological processes.

Land-use planning and zoning are key tools that can mitigate some of these impacts. Oregon, for instance, has statewide zoning and planning, and while the state's population has grown

by a million people since the law was enacted, the negative effect on the landscape has been concentrated in urban growth zones, leaving most of the landscape as open space.

But open space is not the same as *unmanipulated* space. Even though the West is largely unpeopled—and hence open space—it is heavily exploited and hence does not adequately maintain or promote biodiversity. And this is where the second bias comes in: There is an underlying assumption that "open space" is good for wildlife and biodiversity. If this were the case, the West's native wildlife would be thriving.

Again, using Montana as our example, if more than 95% of the state is essentially uninhabited by humans, why are any of its species Endangered? Can't grizzlies, wolves, black-footed ferrets, and the like "get by" on the 85 million acres of Montana open space where almost no person lives? The answer is obvious: They can't because even those areas with low population density are almost universally hostile environments for many species of wildlife due to existing land uses—farming, ranching, and logging, extensively; mining and motorized "recreation" more locally.

Particularly interesting is the geographical distribution of Endangered species in the state. Most of these species that are still holding on are in western Montana, which has the greater population density; in eastern Montana, which is dominated by agriculture ("open space"), species such as the grizzly, bison, swift fox, wolf, black-footed ferret, and many others are extirpated or persist at extremely low population levels.

The problem, of course, is that most of the West's open space is not unmanipulated space. It is seriously compromised by agriculture and, to a lesser degree, by logging. Agriculture is responsible for or implicated in more plant and animal extinctions than any other land use—a fact that is generally ignored in environmental and academic journals, and mainstream media. If a fair evaluation of agriculture's effects on soils, water, wildlife, plant communities, and ecological processes were actually compiled (I am not aware of anyone who has attempted to do this except in the most rudimentary way), it would demonstrate that agriculture is far and away the most destructive land use in the nation.

Unfortunately, agriculture is almost never critiqued in a systematic way. We have an unexamined cultural bias that assumes agriculture is good—so such assessments are seldom done. Nevertheless, even a rudimentary assessment demonstrates the tremendous impact of agriculture upon the landscape. When the causes of species endangerment across the West are listed, farming, ranching, and water developments (almost all water development in the West is related to agriculture) overwhelm all other known sources of species loss.

More generally, conservation biologists identify habitat fragmentation and destruction and exotic species invasions as the leading causes of species endangerment and extinction globally, with direct persecution or overkill a significant, but usually lesser, factor. Agriculture, almost by definition, means destruction of natural habitat, introduction (purposeful or inadvertent) of exotic species, and killing of predators and other unwanted native species.

I don't wish to give the impression that urbanization and rural sprawl are good for wildlife. I do believe, however, that most people lack a geographic and historic perspective. Where the same trends have happened in other parts of the world, the results have not all been entirely negative. Although I could give a number of examples, one of the best is the northeastern United States. Vermont, in particular, provides a useful comparison because it "suffers" from many of the same land-use, economic, and demographic changes that are now occurring in much of the West.

Agricultural Loss and the Rewilding of Vermont

Vermont was extensively settled just after the American Revolution, and by the mid-1800s most of Vermont's forest cover had been cleared and the land devoted to agricultural production. Villages and farms were everywhere. But like the West, most of Vermont is marginal for growing crops, or even livestock. It's rocky. It's cold. The soils are not particularly fertile.

As new agricultural lands became available in the Midwest in the mid-1800s, agricultural production shifted from New England to Ohio, Indiana, and Missouri. The population stagnated and actually declined in many parts of the state for decades; young people migrated to growing industrial centers for jobs or moved west to find more productive agricultural lands. For more than a century, Vermont's total human population barely grew, while the percentage of land in agriculture sharply dropped.

By the 1950s the state had 80% fewer farms than a century before. Woods had reclaimed much of the abandoned farmland. Then in the 1960s, the state's inexpensive land, combined with the rural character of the communities and landscape, began to attract newcomers from urban areas in increasing numbers. The ski industry discovered Vermont. Quality of life began to attract new "footloose" industries. Population began to grow rapidly.

The situation is similar to what we see in Colorado, Utah, Montana, and elsewhere in the West. You can find the same expensive ski resort communities like Jackson and Vail in the Vermont villages of Stowe and Manchester. Housing prices in Burlington, the state's urban center, have jumped to the point that they are beyond the means of many old-time residents.

Second homes have popped up in the woods around the state like mushrooms after a rain. Land prices have risen. The number of farms has declined. Total population has grown to nearly double what it was in the 1950s. None of this is much different from what has happened in Colorado.

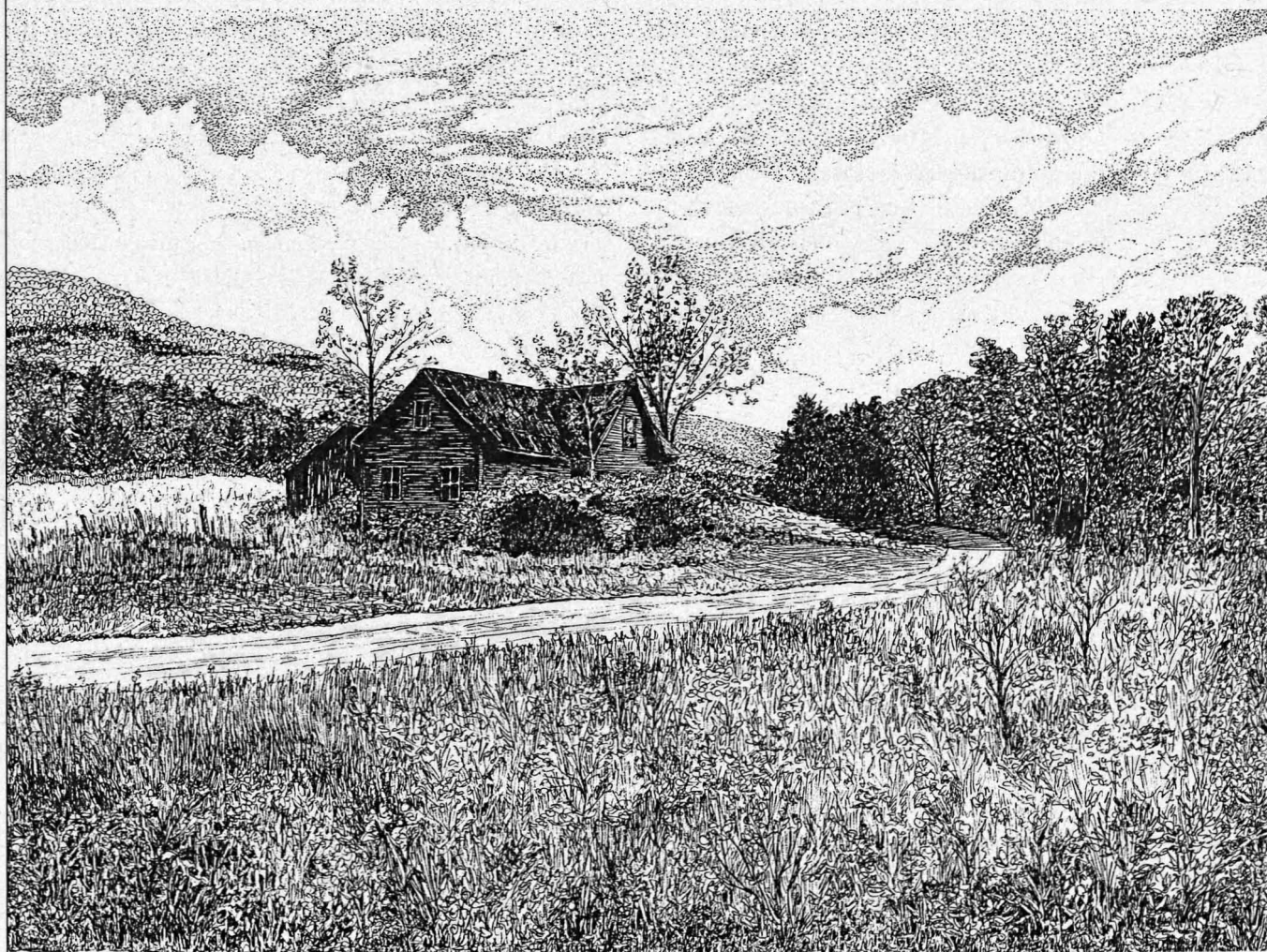
So how has this affected Vermont as a whole? First, there are far more high-paying jobs. It's still not "easy" to make a living in some parts of the state—particularly the rural "Northeast Kingdom"—but it's better than when Vermont's entire economy was based on agriculture, logging, and other extractive industries. The "charming" rural landscape that so many loved about Vermont when farming dominated the land was also an outward face of real rural poverty. Determined as a percentage of the population, the poverty level of Vermont is now the lowest of any state in the nation. Perhaps even more important than population growth in Vermont's changing character is that the human population is far more concentrated than it once was. Vermont is becoming more urbanized, although it is still the most "rural" state by Census Bureau standards.

Understandably, many people in Vermont mourn the loss of the "family farm," but from an ecological perspective, the decline in farming has precipitated largely positive changes. Forests have reclaimed much of the landscape. Wildlife once extirpated have recolonized or been reintroduced to the state; beaver, deer, moose, marten, fisher, turkey, black bear, and other species have all increased, and in many cases have fully recovered from turn-of-the-century lows. Fisheries are in better shape than they have been in a century. There are regular reports of mountain lion sightings, and even serious discussion of eastern timber wolf recovery across the multistate Northern Forest region. There are still some species in decline, and problem areas where wildlife is being displaced by development. Overall, though, Vermont is likely wilder now than it was a century ago.

Certainly, things could be better. Vermont has practically no big blocks of protected wildlands (less than one percent of the state is designated Wilderness). The state's relatively strong land-use planning and zoning help to minimize the conflicts between wildlife and development, but should be stronger still. Clearcutting and liquidation cutting are on the rise. In the Champlain Valley, Burlington's urban sprawl threatens some rare natural communities. Nevertheless, Vermont's ecological health is better now than it was a hundred years ago despite a growing human population and largely *because of declining agricultural production.*

Here it should be acknowledged that Vermont's ecological renaissance is built on the backs of other bioregions, to a pre-

Vermont's ecological health is better now than it was a hundred years ago despite a growing human population and largely *because of declining agricultural production.*



carious degree. As Chris McGrory Klyza and Steve Trombulak explain in their forthcoming book *The Story of Vermont: A Natural and Cultural History*, the state's reforestation has been facilitated, ironically, by a global economy that enables Vermonters to import most of their food and natural resources.* Vermonters' ecological footprint now extends far beyond the state's boundaries, even as cities' ecological footprints extend far beyond the urban boundaries.

Global trade is an enormous and growing problem. Wide-scale agriculture is no antidote, however, and regional self-sufficiency should not come at the expense of local wildlife habitat. Rather, the sensible course is to return most lands to their natural condition and meet our vital needs through efficient, local food and fiber production for frugal, local consumption. Americans can meet their vital needs on a small fraction of the landscape.

**The Story of Vermont: A Natural and Cultural History* by Chris McGrory Klyza and Steve Trombulak will be published in May 1999 by the University Press of New England (800-421-1561).

Decline of Western Agriculture

What has happened in Vermont is what I see happening across the West, and I suspect that the overall consequences of increasing urbanization and declining agriculture will not be as negative as they are frequently portrayed.

Here in Montana, we will see farming and ranching continue to decline, just like in Vermont, and for the same reasons—the landscape has limited productivity. There are better places to grow cows or hay than in most of the West. Except for the production of specialty crops in places such as Oregon's Willamette Valley, winter vegetables in California, apples in Washington, and wine in all three states, western agriculture is waning.

All the consensus group meetings, public relations campaigns, and taxpayer-funded subsidies that industrial agriculture interests can muster won't save western agriculture. It's on life support now and will soon be comatose. Cows, hay, wheat, and most other crops can be grown more efficiently and with less environmental cost in places like Minnesota, Kansas, Virginia, and Missouri—and increasingly that is where their production will shift. Of course, these more productive lands are needed by wildlife, too, and we must not consign any place to the status of sacrifice zone. Even in these states, we should be striving to greatly reduce the extent of our ecological footprint.

In the conservation community, there is currently much discussion about “working” with agriculture to minimize its impacts and “protect” open space. Such optimistic proposals always remind me of the agricultural promoters of a century ago who exhorted that rain followed the plow. Like yesterday's boosters, the people who suggest that we can “save” western agriculture ignore the region's intrinsic biological and geographical limitations. Aridity, rugged terrain, and long distances all enact their costs.

Historically, western agricultural producers were able to compete with more productive landscapes and producers elsewhere only because of subsidies and because land was cheap—large spreads of relatively unproductive land could compensate somewhat for its limited quality. Moreover, environmental impacts including soil erosion, dewatering of rivers, and loss of wildlife were ignored. Land is no longer so cheap, and an educated citizenry is increasingly demanding that such costs be internalized by the producer, not externalized and dumped onto society as a whole, leaving us to pick up the tab for ecological destruction. The bottom line of ecology and economics means that western agriculture will not survive, except in locales with favorable climate and soils.

Furthermore, consensus environmentalists who wish to accommodate existing destructive land uses and prop up the

western agricultural establishment—in the name of fighting sprawl, staving off subdivision, or protecting traditional cultural values—generally ignore the entrenched attitudes of those in agriculture, which are almost universally about “controlling” Nature. Such control is the antithesis of the goal of many conservationists, including myself, who seek to “rewild” the West.

I want to restore ecological processes and native wildlife to the majority of the American West. I don't want “domesticated” open space. I want wild landscapes. I don't believe making wolves wear radio shock collars to keep them from cows is acceptable. I don't want salmon to come from hatcheries. I don't want my rivers regulated by dams. I don't want fires to be “prescribed.” Consensus is only possible when the goals are the same. My goals and the goals of many agricultural producers are in complete opposition.

I predict agriculture will continue to decline across the West, and the result will be small towns and urban archipelagos increasingly surrounded by unmanipulated open space. This changing face of the landscape ultimately will be better for the region's biodiversity, ecology, and perhaps even human population. I no more mourn the loss of the cowboy than the old-time whaler or buffalo hunter.

I would also applaud the departure of the urban cowboy, though. Urbanization begets its own host of problems. With good land-use planning, we can work to minimize, though not fully eliminate, the impacts associated with the inevitable growth of urban centers. Moreover, we need to make our towns and cities more livable by expanding parks, bike paths, urban gardens, and green space. Urbanization brings some opportunities: If managed properly, its ecological costs can be minimized and the cultural and educational opportunities it affords enhanced.

Someday an astute demographer or biologist will calculate the minimum amount of land necessary to meet the vital needs (food, shelter, fuel, fiber) of Americans. I predict that she will find that even with the United States' presently bloated population of about 270 million people, we could fully meet our real needs on less than 20% of our country's land base. The rest can go wild.... ☾

Writer and photographer George Wuerthner (POB 1526, Livingston, MT 59047) is the author of 22 books on natural history, geography, and recreational values of America's wild places. His latest work is a natural history guide of Olympic National Park to be published by Stackpole Books in summer 1999.



The Toilet Paper Question

by P.J. Ryan

The subject of this discussion is the philosophical question posed by that great Zen master, Congressman Young of Alaska, who asked rhetorically, "Where does toilet paper come from?"

Now buckaroos, this is a question that ranks right up there with the Baltimore catechism's inquiry of "Why did God make us?" Congressman Young's question is deceptively simple, but is subtle and many layered. While agreeing (I think) with the main tenet of Joyce Kilmer's verse about "Never seeing a poem as lovely as a tree," Congressman Young regretfully informs us that America's National Forests, beautiful as they are, must be harnessed to America's bowel movements (a multiple use too delicate for the Forest Service to discuss).

Now, we've previously disputed the idea that the National Forests (or at least the western and Alaskan National Forests) are the main source of pulp for the manufacture of toilet paper, suggesting that the primary source of pulp for toilet paper and other paper products is very probably the private industrial forests of the South and the state of Maine.

As yet, we have no definitive comment from the US Forest Service or the Department of Commerce on the source of toilet paper, but we are working on it. However, in the interim, we did run on to some interesting information. It seems that not all toilet paper is made from trees, as suggested by Congressman Young.

The *Consumer Reports* of November 1998 listed an interesting product called "Purely Cotton" which claims to be "the first toilet tissue made not from wood pulp, but from cotton, specifically the short fibers not usable in textile manufacturing." The magazine compared "Purely Cotton" to two popular brands at opposite ends of the (wood pulp) spectrum, "Charmin Ultra" at \$1.21 for a four-roll pack and "Scott Tissues" at \$2.45 per four-roll pack. According to *Consumer Reports*, the cotton tissue combined the best qualities of the above mentioned wood pulp tissues. It had a comparable absorption rate, was softer, and disintegrated well in the toilet. The final kicker is that "Purely Cotton" sells for just \$1.13 per four-roll pack. How can they do this in defiance of Congressman Young? Are they some sort of government subsidized environmental bleeding hearts unfairly competing with wood pulp toilet paper?

Well, no. I suspect that the company brass (who run Linters Inc.) are greedy Republicans like you and I, out to make a buck—not save the world. The reason they are able to make their product so cheaply is that its main ingredient, cotton lint, is an heretofore unwanted by-product of a desired end-product, cotton cloth. (Historical note: cotton lint used to float around the air in textile mills until it eventually came to rest in the lungs of workers, causing an unfortunately fatal ailment called "brown lung." A meddling, spoilsport federal government made the textile industry clean the lint out of the air, unwittingly providing the basis for a profitable, environmentally benign industry.)

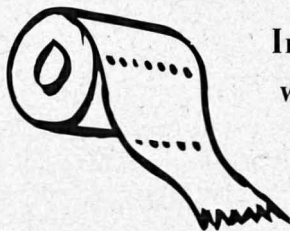
Well, there you have it, Congressman Young, no socialists under the bed, just American Free Enterprise.

SPEAKING OF TREES, WE SHOULD NOW SPEAK OF THE latest “wise use” buzz word—that is, “working forests,” a sort of double-time version of the Forest Service’s old chestnut, multi-ple use. In a “working forest” there is a place for posey-sniffin’, bird-watchin’ effete city folks as long as they know their place and don’t interfere with hard-workin’, salt-of-the-earth loggers, miners, and graziers who put food on these city folks’ table and provide the wood for the table and the coal to heat the house etc., etc., unless they are shackled by govmint regulations, etc., etc. Though only about four percent of the above products come from National Forests, the idea of a “working forest” producing a tangible product rather than just bird song and beauty and clean air and water is an effective public relations gambit for greedheads.

However, when it comes right down to it, most of us consider money to be the most tangible product of all: not beef, or logs, or chunks of coal, but rather the ability to insert a piece of

which is perhaps one reason that New Hampshire does not have a state income tax or a sales tax.

Naturally, for this self-renewing golden goose of a “resource” to continue to keep on laying golden eggs, it is important that the forest be interesting to look at—that is, relatively natural, with many species of trees all providing different shades of red, yellow, purple, and green, growing in an (apparently) haphazard, cluttered manner as planted by our (apparently) dyslexic God. New Hampshire could, if it chose, get rid of those slow-growing deciduous trees and replace them with fast-growing, genetically engineered conifers, which could possibly get the cost of wood pulp down to where they could compete with cotton toilet paper, employ more loggers in the “forest,” and maybe even make 30 million a year. Would people come to see an even-aged conifer forest that looked like green dog hair? Probably not.



In a “working forest” there is a place for posey-sniffin’, bird-watchin’ effete city folks as long as they know their place and don’t interfere with hard-workin’, salt-of-the-earth loggers, miners, and graziers who put food on these city folks’ table and provide the wood for the table and the coal to heat the house etc., etc., unless they are shackled by govmint regulations, etc., etc.



plastic in a wall and have that wall belch out \$20 bills. (I never cease to be amazed by that trick, buckaroos!)

So if money is our goal, let us consider a *real* “working forest.” According to a recent article in *USA Today*, the state of New Hampshire expects a very good season for “leaf peepers.” What are “leaf peepers”? Well, they are the folks who drive through New Hampshire and look at the changing colors of the leaves in the fall. (This should enrage any salt of the earth; them city folks should be drug outta their cars made ta split wood and find out what *real* work is, the idear a lookin’ at leaves, etc., etc.)

But wait! Perhaps the “leaf peepers” make some modest contribution to New Hampshire’s economy. Perhaps as much as, say, seven million dollars? Try *700 million dollars*, neighbors. Leaves are big business in New Hampshire. Moreover, for the geographically challenged, it should be noted that New Hampshire is just one of the New England states, several of which have discovered that multi-hued autumnal leaves are a serious cash crop. Some six million people visit New Hampshire to look at those falling leaves and leave all that money behind,

Would they come to see clearcuts in the Pacific Northwest? (That’s what they would see, mile after mile, if the all-important “beauty strip”—or Potemkin strip—were to be removed.) Probably not.

The US Fish and Wildlife Service recently did a study that indicates that if “Watching Wildlife” were a *Fortune 500* company (that is, if there was a single corporation that made its money off people who simply went searching for wildlife to look at—not hunt, mind you, that is a whole ’nuther profitable company) that the “Watching Wildlife Corporation” would rank 27th in the *Fortune 500*.

Not bad for bird watchers, Congressman Young. Perhaps we should invest in both cotton toilet paper and more wildlife refuges. ☺

P.J. Ryan works for the National Park Service and publishes “the oldest alternative newsletter in the federal government,” Thunderbear (POB 2341, Silver Spring, MD 20915, \$14 per year.) This essay is adapted from the October 1998 issue (#212).

Book Reviews



Reviewed
in this issue

Science Under Siege

Reading the Mountains
of Home

Measures of Success

Texas Land Ethics

Science Under Siege: The Politicians' War on Nature and Truth

by Todd Wilkinson, foreword by David Brower and introduction by Jim Baca; Johnson Books (1880 South 57th Court, Boulder, CO 80301; 800-258-5830); 1998; \$28 (cloth), \$18 (paper); 384 pp.

There is this look some of them—the agency scientists—will get, out in the woods while on a field trip, or at a public meeting, when someone asks the hard or uncomfortable question, the question that risks exposing the too-frequent truth behind the myriad development projects being conducted by private corporations on public lands. The bare, bald truth being, of course, that for too many of those projects, the driving force is short-term liquidation of the public resources.

Often the skill and manpower that the agencies are required to assemble to administer the exploitation is expended not for the relatively simple logistics of execution—pouring the dam's concrete, turning the cattle out into the desert, signing a form to allow motorcycles and snowmobiles to roar through the National Forests, or sawing down the oldest, largest trees and loading them onto a truck and driving them far away. Rather, the energy and effort—the expenditure of public dollars—lies in the crafting of language and the presentation of these abuses in such a manner to make it seem that these projects *need* doing, that the public lands will be harmed if the dam is not built, or the forest is not logged.

Other times, the truth, the scientific facts, are “merely” repressed—though again, through huge effort on the part of the public servants attempting to coordinate the projects. (And those public servants in turn are owned or manipulated by members of Congress, who directly control the funding for the various agencies affecting the public lands, and, not-so-indirectly, the hiring and firing of individuals.)

This is the story Todd Wilkinson tells with excruciating detail in his recent book *Science Under Siege*. Money breaks wills, buys weak or vulnerable or greedy or ambitious or compromised people, of which no civilization has been in short supply.

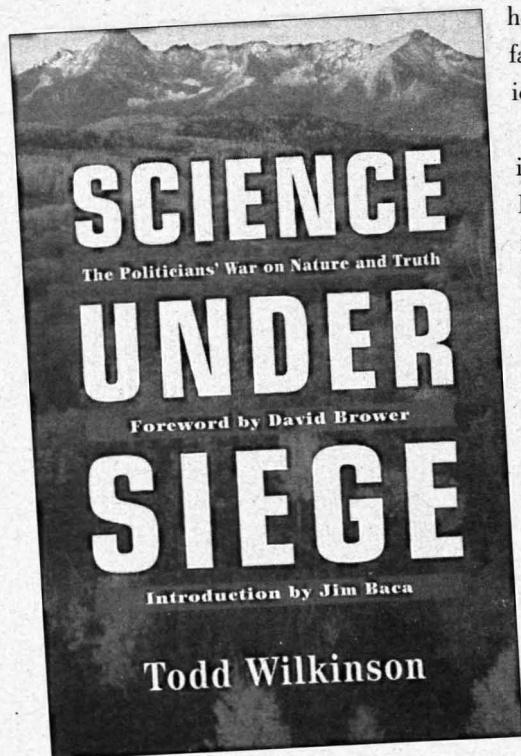
At first reading *Science Under Siege*, one is disheartened, even depressed, by the number of instances in which the scientific facts are suppressed for the short-term “good” of corporations, and also by the recent dates of the cases. The issues chronicled by Wilkinson, a reporter for the *Christian Science Monitor*, cannot be dismissed as Cold War-era horror tales. The majority of them are current and ongoing, unresolved.

The chapters are structured as profiles of various individual scientists who have stood firm in their biological assessments despite the steady pressure—subtle at first, but then increasingly blunt—to change or suppress their findings, and who have faced the personal and professional costs that always come with such integrity.

The lucky ones are simply shunned or ridiculed within their various communities and agency workplaces (the US Forest Service, the Bureau of Land Management, the US Geological Survey, the Environmental Protection Agency, the US Fish and Wildlife Service, the National Park Service, the Utah Department of Wildlife Resources, etc.).

The less fortunate ones are transferred to remote outposts, given menial jobs, or fired outright. In case after case, Wilkinson presents the pattern involved by the higher-up land managers who attempt to repress or refute the scientists. *Make the dissenters the issue instead of their issue. Isolate the scientific dissenter.* The tactics worsen. *Create trumped-up charges against the person the agency wants to silence. If you can't make conditions miserable enough so that the whistleblower quits, eliminate the job.* Still worse: *Prosecute them.*

Being human, the heroes in Wilkinson's book often respond, over time, in the same ways: with heart attacks, ulcers, depression, esophageal rottings, early retirement.... Who would want such a job in the first place, in which the truth is so clearly for sale? Who could stand up to such pressures?



Gradually, however, a reader's profound discouragement is overtaken by mounting admiration: for the calm, wise, steady fierceness of scientists such as the world's most harassed grizzly bear biologist, Dave Mattson, working in Yellowstone National Park, where his supervisors emptied his file cabinets as he continued to espouse his opinion that grizzlies in the Lower 48 are doomed to extinction under present management policies. For the eloquence of geologist Howard Wilshire arguing on behalf of the landscape of the desert tortoise, and for Carlsbad Caverns expert Ron Kerbo. For the courage of hydrologist Ben Lomeli, who would not make his

reports on the Southwest's San Pedro River rosy enough for pro-development boosters. (One statement describing Lomeli could well apply to any of the "whistleblowers" or "combat scientists" under siege in this book: "If there is anything radical and revolutionary about him, it is that he still believes in letting scientific facts guide decisions because political science has been a failure.")

Other scientists profiled include fisheries biologist Al Espinosa, working for aquatic integrity on his beloved Clearwater National Forest in Idaho; US Forest Service employee Jeff DeBonis, who was stunned by the clearcuts in Oregon's Willamette National Forest; Utah herpetologist David Ross, kicked around like a soccer ball by Utah's "Cowboy Caucus"; and the Environmental Protection Agency's Jeff van Ee, who committed the heinous crime of hanging out in his spare time with members of the Sierra Club.

THERE IS THIS LOOK MANY OR MOST of them—the agency scientists (but none of the ones in this book)—will get, when asked a hard question requiring a scientific, not a political, answer. It is a look that speaks to survival. In any given group, the scientist will, before answering the question, search out the fiercest, most knowledgeable environmental activist in the group, reading his or her body language, as prey might gauge a potential predator—trying to guess, from body language alone, how much the activist knows—and, if the coming answer is to be hedged, how harshly the activist might judge the scientist.

The look skews then to the

opposite side of the group—to the most vehement extractive industry representative. How mad will the answer make that person?

The look skitters next to the agency supervisor. Is he or she looking pleased? Concerned? Threatening? (Often, after a too-frank scientific answer, an agency higher-up will, as if unable to help him- or herself, step in and amend or paraphrase or even revise the scientist's remarks, polishing off the edges, sanding and shaping the raw truth—as if the real answer has already been decided.)

Science Under Siege is a remarkable project, both daunting and inspiring. It details almost too clearly one of the most elemental tenets of our time, or any other time: that truth has its own specific and considerable power, and that because of this, we cannot help but be tempted to shape and bend it, to buy and sell it. Wilkinson's book makes the case that this is a human certainty, a flaw, a weakness, that is being manipulated more than ever by the ever-more-massive corporations and their elected senators and representatives, with dire results for our dwindling public wildlands.

There are thousands of people in the governmental agencies who are not for sale—who exist, and persist, valiantly, in that strange no-man's land of being paid by the agency, but not bought or owned by the agency, or by Congress—individuals who still possess their integrity—but, as Wilkinson shows us, the cost is not cheap.

Reviewed by RICK BASS, who lives in Montana's Yaak Valley, where there is still not one acre of designated Wilderness. He is the author of many books of fiction and nonfiction, including the novel Where the Sea Used to Be and the book-length essay The New Wolves.

Reading the Mountains of Home: A Dialogue Between Wilderness and Culture

by John Elder; Harvard University Press (79 Garden St., Cambridge, MA 02138); 1998; \$22.95 (hardcover); 249 pp.

"For how else does one learn to become a person rooted in the land, how else does one nurture a family life in tune with the seasons, except by the stories and examples of those who preceded us in this place on earth?" (p. 218)

The challenge to live well on the land requires that we develop economies and political systems that respect the limits of the land; we must establish large systems of wildlands or ecological reserves, and our land management must have a low impact. But it also requires something more—a rebirth of a land-based culture. Cultural restoration is the soul of ecological and economic restoration.

A sure sign that the Northern Forest region is in the early stages of cultural renewal is the development of a Northern Forest literature, "a dialogue between wilderness and culture" (p. 83). John Elder's recent book *Reading the Mountains of Home* is a wonderful contribution to this dialogue. I hope, and trust, that it is just the beginning.

Elder, who teaches English literature and is one of the mainstays of Middlebury College's acclaimed Environmental Studies Program, lives in Bristol, Vermont, not far from the 3740-acre Bristol Cliffs Wilderness Area in the Green Mountain National Forest. His elegant book describes a series of contemplative walks he took in this Wilderness Area over the

course of a year. The book is also a parallel meditation on the great Robert Frost poem "Directive," which was composed in 1946 when Frost resided not far from Bristol. I confess that I was a trifle skeptical about this approach when I started reading, but Elder swiftly won me over with his persuasive, but low-key, meditations about the land, the poem, and events in his own life, as well as a number of so-called environmental issues, such as wilderness protection and the role of humans in Nature.

Reading the Mountains of Home is a deep, lyrical celebration of living very locally. Yet, its very focus on such a small plot of land leads the writer and reader to ponder universal questions of living lightly on the Earth.

Although Elder's book addresses a wealth of subjects, I will focus on two closely related themes: the lessons to be learned from the subtle wilds of the East, and the differing views of wilderness held by wilderness lovers of the eastern and western United States.

AS ELDER POINTS OUT, THE DESIGNATED Wilderness Areas in Vermont are not virgin forests. Once they were cleared; once there were farms and sawmills. Today, our eastern Wildernesses and National Forests teach us that "wilderness can grow as well as shrink" (p. 20). Wilderness can be restored, if we will let it; and it will reassert itself as soon as we stop logging, farming, or otherwise managing it.

In the chapter "Bristol Cliffs," Elder quotes these two lines from "Directive":

*You must not mind a certain coolness from him
Still said to haunt this side of Panther Mountain.*



"Presence within absence is Frost's theme," Elder writes, "and my own." Frost refers to the glaciers that covered the region 15 millennia ago, but are now, at least temporarily, absent. The same can be said for the panther, for the pre-settlement forest, and for the human beings who lived here in bal-

ance with the landscape for thousands of years. "Silence and absence teach us to pay attention" (p. 64).

Vermont "shows that wilderness can overtake civilization," he writes. "Nature also surrounds and defines our settlements."

AT LEAST ONE VERMONT-BASED reviewer of this book seized on Elder's treatment of the differing approaches to wilderness protection between eastern and western conservation activists (see Chris Bohjalian's review in the *Boston Globe Magazine*, April 22, 1998). I think the reviewer misunderstood western wilderness defenders, and perhaps read too much into Elder's words: "But a dialogue between wilderness and culture is what we need now anyway, not a resolution.... The western-based environmental movement has often asserted the value

of 'virgin wilderness.' But Vermont's return to wildness around the wreck [of an airplane that crashed on South Mountain] offers instead, the image of a marriage. Not a dichotomy, but a dynamic, procreative union" (p. 83).

Earlier, Elder warned that Wilderness designation can be a trap, a "false dichotomy" that sees humans and culture as separate from wild Nature. He points out that Native Americans "live in daily communion" with the land. He reiterates Bill McKibben's message that eastern Wilderness offers us the opportunity to integrate culture and wildlands. I think most western wilderness defenders would agree. However, the West still has undeveloped wilderness on a large scale. These last remnants of unmanaged, ancient ecosystems should be protected for their ecological value. This does not mean segregating humans from these areas; rather, we must exclude destructive human activities that compromise the integrity of these last virgin systems. If such places still existed in Vermont, I suspect that Elder would agree that they should be protected from inappropriate human activity because of their ecological value and rarity.

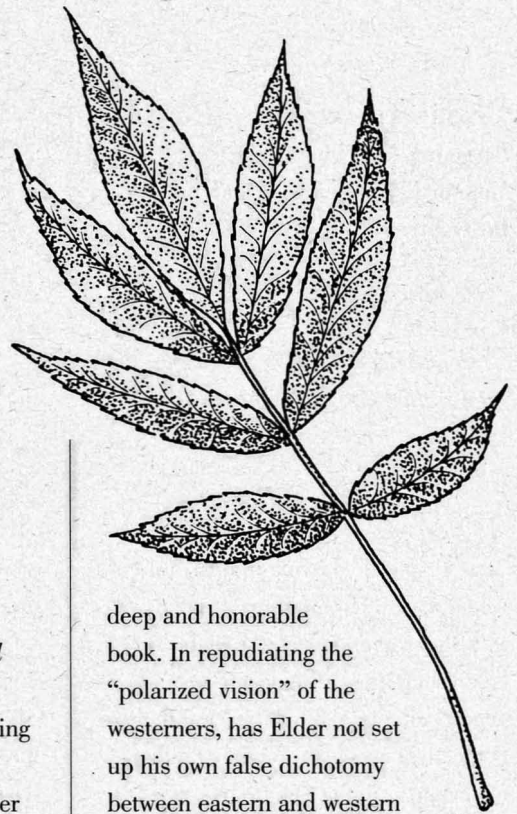
This raises an additional point. Elder sometimes seems not to make a clear distinction between wilderness that has been through a process of rewilding, and virgin lands. I share his celebration of the recovering wildness in the Northern Appalachian region. But, we can never know what has been lost from the ecology of the presettlement forests. If half of Vermont were rewilded, as portions of the Green Mountain National Forest are, and the other half were "virgin," I'm confident that ecologists could point to substantial ecological impoverishment in the

rewilded portion. Now, don't get me wrong; I love these rewilding areas, and am working feverishly to assure that ever greater portions of this beautiful region enjoy a similar fate. But, I can never forget that much has already been lost.

And, of course, how much more will we lose, if we delay protecting vast tracts of recovering wildlands for another 50 years of industrial-scale logging?

Reflecting about Vermonter George Perkins Marsh, whose 1864 classic *Man and Nature, or Physical Geography as Modified by Human Action* played a pivotal role in securing protection for the wild forests of the Adirondack Park a century ago, Elder writes: "The western wilderness ethic affirms that wilderness has integrity—that the value of land does not derive from its immediate usefulness to humans. Marsh's complementary insistence is that humanity should preserve wilderness because we too have integrity" (p. 128). We aren't "interlopers," Elder writes, but "a part of the natural world, drawing strength, with the trees, from a common source." This, for me, is the essential message. But, I must add, we have a responsibility to conduct our lives in accordance with the limits and possibilities of the landscape—not with the develop-at-all-costs mentality of so much of Euro-American culture.

A page or so before the end of the book, Elder reflects on a map of the Green Mountain National Forest. "The map offers a big picture, within which nature and culture enclose one another, in contrast to the more polarized vision of the western wilderness movement" (pp. 233-234). I confess to some discomfort with this statement, which I feel is a trifle too simplistic for such a



deep and honorable book. In repudiating the "polarized vision" of the westerners, has Elder not set up his own false dichotomy between eastern and western wilderness protection?

Yes, wilderness defenders approach their work differently from region to region, just as different regional ecologies create differing local cultures. What works in Vermont may or may not work elsewhere. What is important is not that Vermont has found the right answer, but that some Vermonters have discovered a valuable truth that can inform other regions. I for one have learned a great deal from our western colleagues. The issue to me is not our approach or theirs, but the dialogue we need to have with each other, and with many, many others.

The final litmus test for the Vermont approach so eloquently outlined by Elder is that it shows some results in securing more land protection, while nurturing a culture that can live within its ecological means.

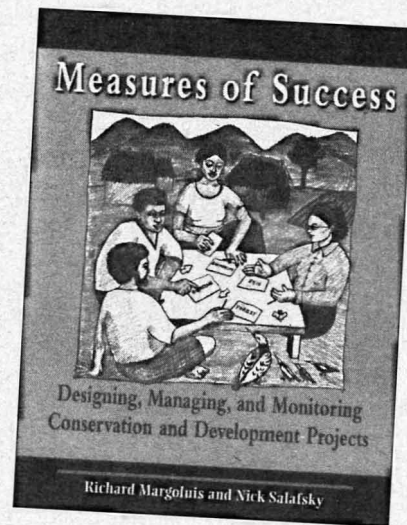
Reviewed by JAMIE SAYEN, founder of the Northern Appalachian Restoration Project and publisher of its invaluable newsletter the Northern Forest Forum (POB 6, Lancaster, NH 03584).

**Measures of Success:
Designing, Managing, and
Monitoring Conservation and
Development Projects**

by Richard Margoluis and Nick Salafsky; Island Press (1718 Connecticut Ave. NW, Suite 300, Washington, DC 20009); \$35; 362 pp.

Despondency is a rational response to living in this world of wounds, with its thinning ozone layer, increasing abundance of greenhouse gasses entering the atmosphere, and accelerating loss of habitats and their component species. Enlisting the help of "experts" in the fight to heal the Earth is difficult; most are too self-absorbed in their own lives and careers to become meaningfully involved. While some activists have given up their day-to-day work to pursue advanced degrees in conservation-related fields, most activists spend long hours training themselves. This book was written for the latter: the non-expert with a passion for conservation and some self-schooling. The authors wrote the book "to demonstrate a simple, clear, and systematic approach to designing, managing, and monitoring projects that seek to conserve biodiversity" (p. 7). I believe that *Measures of Success* would benefit any grassroots organization developing reserve design proposals, regardless of where they are in the process.

The authors work for the Biodiversity Support Program, a USAID-funded consortium that includes The Nature Conservancy, World Wildlife Fund, and World Resources Institute. Both Margoluis and Salafsky have experience in designing, developing, and implementing



conservation and development projects in developing nations.

The chapters in *Measures of Success* are organized according to stages in a typical project cycle. At the beginning of any conservation project, your group's mission must be clarified and the tactics appropriate for your group must be determined. Then, you can identify a target ecological condition for your area and note what factors prevent this target condition from being reached. Next, develop activities to move the area toward the target condition. Monitor and periodically evaluate your progress. Finally, let others know what is being accomplished. The book concludes with a 112-page appendix containing four case studies.

This is all, of course, common sense. But the book lays out each of the steps in such a remarkably clear and thorough manner that it can almost be used as a cookbook for implementing conservation projects. I'll give two examples: First, the authors walk a reader through the process of developing a comprehensive conceptual model of a project area, instructing us on how to identify all direct and indirect threats to the area and find reliable information about these threats.

Moreover, they offer criteria for prioritizing which threats to abate first and which to address later, given

limited money and personnel. Second, the chapter on communicating the results of one's work to larger audiences far surpasses the standard recommendation of doing a press release or video project. The authors emphasize identifying a target audience, including the type of information they would be most interested in receiving, and the communication format that would be best suited for that audience. This book is not an organizers' guide for conservation activism; it is a blueprint for a successful land conservation campaign.

Some of the strategies provided in the book assume a high degree of local control over lands and resources. This may be true in certain developing countries that lack the regulatory infrastructure to centralize resource management, but it certainly is not true in the United States or Canada. Because of this focus on developing nations, the book approaches the conservation organization as though its role is to help develop and implement a management plan. Wildlands Project collaborators and other groups doing reserve design in the United States and Canada would need to substitute an organizational strategic plan for this notion of a management plan.

The detailed information contained within *Measures of Success* is presented in a fun, accessible style; the book's structure, layout, and tone was influenced by Charlie Papazian's *The Joy of Home Brewing*. Every organization and activist involved with conservation planning and implementation should get a copy of this book, read it, and keep it as a reference.

Reviewed by **TOM ROONEY**,
a research assistant in the Botany
Department, University of Wisconsin-
Madison.

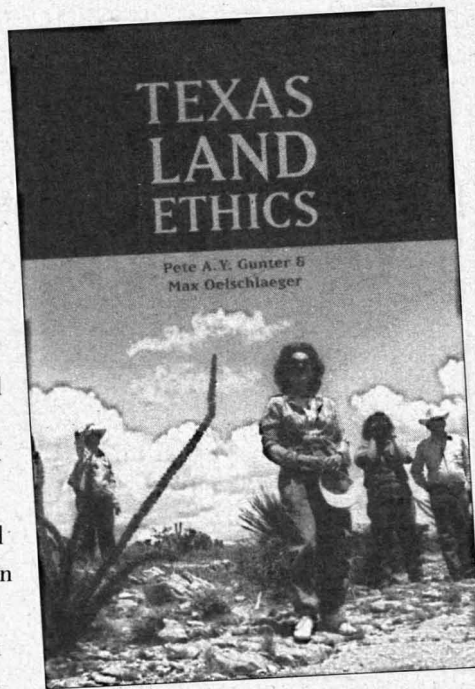
Texas Land Ethics

by Pete A.Y. Gunter and Max Oelschlaeger; University of Texas Press (POB 7819, Austin, TX 78713); 1997; \$18.95 paper; 156 pp.

As a former Texas resident, I am continually amazed by both the problems and potential of environmental action in the Lone Star State. While the geographic and biotic variation of the Texas landscape makes for fascinating exploration and study, and the vast reservoir of open space offers hope for conservation efforts, the laundry list of the state's ecological problems and continuing mismanagement would make almost anyone cringe. The nation's leader in greenhouse gas emissions and the unfortunate inheritor of 30 Superfund sites awaiting cleanup operations, Texas is also a beleaguered haven for over two hundred species awaiting placement on the federal Endangered species list. Nuclear waste facilities in the Panhandle, clearcutting of the Piney Woods, mercury contamination of the coastal bays; everything comes bigger in Texas, including the scale of environmental degradation.

Rather than launch a salvo of bitter invective against those who are regularly demonized for despoiling the natural world, *Texas Land Ethics* presents a moderate, well-reasoned argument for the development and widespread acceptance of a land ethic, one which is formulated to circumvent the wearisome and unproductive debate over the environment vs. the economy. Authors Gunter (a professor of philosophy at the University of North Texas) and Oelschlaeger (McAllister Chair in Community, Culture and Environment at Northern Arizona University) both

possess an abundance of experience in Texas conservation battles (Gunter was pivotal in the establishment of the Big Thicket National Preserve). They move through the issues with dexterity, utilizing a "common sense" argument rather than resorting to stylized, philosophically charged rhetoric that readers may find obtuse or unstimulating. They have no illusions about their audience; this volume is a citizens'



primer on the desperate condition of the natural and human environments in Texas, a stripped-down plea to the state's residents for sanity and reason in the management and use of the splendid natural resources that remain after more than a century of frenzied exploitation. Those searching for a generalized, perspicacious methodology for engendering ecological enlightenment in the ill-informed masses or for combatting corporate despoilers should look elsewhere.

Texas Land Ethics develops a "working" philosophy for conservation: expanding on Leopold's famous dictum, the authors present a statement of

goals and values and apply them to apparent conflicts between the environment and the economy. Their land ethic is general enough in appeal and practice to resist attack by those Texans who treat any concern for Nature as a meddling and costly hindrance on a surging economy. For those familiar with the social and cultural environment of Texas, the efficacy of this decision on the part of the authors is readily apparent; still possessed of a frontier mentality, Texans react violently to any suggestion that resources are limited or that land is anything but a resource waiting for human use. By addressing commonplace, yet often ignored issues such as urban sprawl and flooding, Gunter and Oelschlaeger demonstrate that a land ethic is neither extremism nor pie-in-the-sky idealism, but rather a middle ground where careful planning provides economic benefits while safeguarding the natural environment.

Some readers may find the arguments in *Texas Land Ethics* to be simplifications with little substance and less value. However, the state's ecological problems are so grave and the discussion of alternative futures so rife with fruitless dialectic that a basic statement of values is a productive and needed starting point. If Texans ever hope to achieve a future where clean air, water, and soil are not dreams of the past, and where some semi-wild, ecologically viable areas are within the reach of each citizen, they might do well to look for that future in this brief, clear-eyed book.

Reviewed by ANDREW J.

KROLL, a graduate student at New Mexico State University in Las Cruces, NM who also runs Armadillo World Headquarters, an environmental consulting firm.

Natural Areas Association Conference

The Wildlands Project and *Wild Earth* will co-host the 1999 Natural Areas Association Conference from October 12–16 in Tucson, Arizona. Symposia, plenary sessions, keynotes, and workshops will address the theme “Conservation Planning: From Sites to Systems.” Sessions will feature a broad range of topics, including: ecoregional planning, focal species, pollinators, carnivore reintroduction, transboundary initiatives, compatible use, Wilderness designation, connectivity, exotic species, wetland ecosystems, research and monitoring, natural area interpretation and use, and computer mapping and modeling. Additional sessions, such as riparian restoration, fire in montane ecosystems, grazing systems, and state trust lands, will relate to the Southwest. Field trips will focus on southwest desert ecosystems and the mountainous Sky Islands and other highlands. For further information about the conference, contact the local host, The Wildlands Project, at 1955 West Grant Rd. #148, Tucson, AZ 85745; 520-884-0875; fax 520-884-0962; information@twp.org; www.twp.org.

Fire & Grit The Orion Society will present a millennium conference June 21–25, 1999 at the National Conservation Training Center in Shepherdstown, West Virginia. Entitled “Fire & Grit: Working for Nature in Community,” the gathering will bring together grassroots environmental leaders, nature writers, educators, scientists, and others to map a comprehensive vision for conservation in the 21st century. “Fire & Grit” will highlight the importance of place-based thinking and action. Plenary speakers such as Bruce Babbitt, Wendell Berry, Gary Paul Nabhan, Terry Tempest Williams, and Rick Bass will address the conference themes of Community, Spirit, and Sacrifice. The registration fee is \$225; or \$175 for individual and organizational members of The Orion Society. Visit the Fire & Grit website at www.orionsociety.org; or make inquiries by e-mail to orion@orionsociety.org; mail to Fire & Grit, The Orion Society, 195 Main St., Great Barrington, MA 01230; fax 413-528-0676; or, for urgent questions, phone 413-528-4422 ext. 34.

SCB Annual Meeting The Society for Conservation Biology Annual Meeting will be held June 17–21, 1999 at the University of Maryland, College Park. The meeting will be co-hosted by the university's graduate program in Sustainable Development and Conservation Biology and the Smithsonian's Institute for Conservation Biology. A plenary meeting and three symposia will address the theme of the gathering, “Integrating Policy and Science in Conservation Biology.” Visit the meeting website at www.inform.umd.edu/SCB; online registration is available. For more information, contact David Inouye; 301-405-6946; fax 301-314-9358; di5@umail.umd.edu.

Wilderness Science Conference “Wilderness Science in a Time of Change” will present wilderness science research results and discuss contemporary wilderness and large protected areas issues and dilemmas. The conference will open with a keynote address by Gary Snyder; plenary session speakers include Dave Foreman, Baird Callicott, Jill Belsky, and Daniel Botkin. The University of Montana in Missoula will host the conference from May 23–27, 1999. For registration information, contact Christine Ross, Continuing Education, University of Montana, Missoula, MT 59812; 406-243-4623; fax 406-243-2047; nrm@selway.umt.edu; www.umt.edu/wildscience.

Documenting the Destruction of California's Forests

The California Wilderness Coalition has published a 311-page report that documents the loss of potential Wilderness Areas in California's National Forests. *California's Vanishing Forests: Two Decades of Destruction* shows which wild areas have been scarred and which have been spared, and makes a convincing case for protecting what remains of California's forest heritage. For a copy of the report, contact the California Wilderness Coalition, 2655 Portage Bay East, Suite 5, Davis, CA 95616; 530-758-0380; info@calwild.org.

Ecological Restoration Conference The Society for Ecological Restoration's 1999 International Conference will be held at the Presidio in San Francisco, California from September 23–25. The gathering will bring together the fundamental elements of ecological restoration: stewardship, science, art, and practice. For a registration brochure, contact the Society for Ecological Restoration, 1207 Seminole Hwy., Suite B, Madison, WI 53711; 608-262-9547; fax 608-265-8557; ser@vms2.macc.wisc.edu; www.sercal.org/ser99.htm.

Deep Ecology: The Future Primitive Way The Eighth Annual Deep Ecology Workshop will be held in the Elk Mountains of Colorado from July 16–18, 1999. The gathering will feature Dolores LaChapelle, pioneer of the Deep Ecology movement in the US. For more information, contact the Aspen Center for Environmental Studies, POB 8777, Aspen, CO 81612; 970-925-5256.

Connecting Human Numbers & Habitat Loss The National Audubon Society's video “Who's Counting” addresses human population growth and wildlife habitat issues. The video can be used as an organizing tool to inspire citizens, especially birders, to work locally on these issues and to urge their congressional representatives to support international family planning. Order the video from Audubon's Population and Habitat Campaign at 1-800-741-9658.

Whole Terrain The annual publication of the Environmental Studies Department of Antioch New England Graduate School, *Whole Terrain*, is now available. With a theme of “Transience, Permanence, and Commitment,” the issue considers questions of identity, belonging, and connection in the midst of mobility and change. Contributing writers include Chellis Glendinning, John Elder, and David Abram. Recent and back issues of *Whole Terrain* are available for \$7 from Antioch New England Graduate School, Department of Environmental Studies, 40 Avon St., Keene, NH 03431; 603-357-3122 ext. 272; www.antiochne.edu.

Toward an Ecocentric Humanity The second “Toward an Ecocentric Humanity” conference will be held July 17–23, 1999 at the Ferry Beach Park Association, Saco, Maine. Discussion of conservation biology, ecospirituality, restoration ecology, deep ecology, and other topics will encourage participants to examine their beliefs and share their knowledge of the path to ecocentrism. For more information, contact Tony Federer, 15 Oyster River Rd., Durham, NH 03824; 603-868-5463; compassb@nh.ultranet.com; www.nh.ultranet.com/~compassb/ecohum.htm.

Religion and Ecology Conference Sponsored in part by the United Nations Environmental Program, “Religion and Ecology: Discovering the Common Ground” will help create further partnerships between religion and other sectors working to ensure the well-being of future generations. The conference will be held October 20–21, 1999 at the United Nations in New York. Contact Janet Edwards at edwards@unep.un.org.

Land Conservation Leadership Program The Land Trust Alliance and The Conservation Fund created a partnership in 1997 to offer specialized courses for land conservation professionals. In 1999, eight courses in six US locations will be offered. For program information, contact Andy Weaver at the Land Conservation Leadership Program, Land Trust Alliance, 1319 F St. NW, Suite 501, Washington, DC 20004; 202-638-4725; fax 202-638-2514; aweaver@lta.org.



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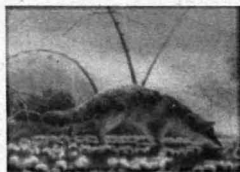


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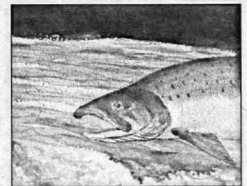


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BACK ISSUES

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

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

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

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

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

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

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

8 Winter 1992/93 • Critique of Patriarchal Management, Mary O'Brien's Risk Assessment in

the Northern Rockies, Is it Un-Biocentric to Manage?, Reef Ecosystems and Resources, Grassroots Resistance in Developing Nations, Wuerthner's Greater Desert Wildlands Proposal, Wolke on Bad Science, Homo Carcinomicus, Natural Law and Human Population Growth, Excerpts from *Tracking & the Art of Seeing* and *Ghost Bears*

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

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

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

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

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

13 Spring 1994 • Ed Abbey posthumously decries The Enemy, David Clarke Burks's Place of the Wild, Ecosystem Mismanagement in Southern Appalachia, Mohawk Park Proposal, RESTORE vs. Whole-Tree Logging, Noss & Cooperrider on Saving Aquatic Biodiversity, Atlantic Canada Regional Report, Paul Watson on Neptune's Navy, The

Restoration Alternative, Intercontinental Forest Defense, Chris McGrory-Klyza outlines Lessons from Vermont Wilderness

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

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

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

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

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

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

20 Winter 1995/96 • *TWP Special Issue #2*. Testimony from Terry Tempest Williams, Foreman's Wilderness: From Scenery to Strategy, Noss on

Science Grounding Strategy and The Role of Endangered Ecosystems in TWP, Roz McClellan explains how Mapping Reserves Wins Commitments, Second Chance for the Northern Forest: Headwaters Proposal, Klamath/Siskiyou Biodiversity Conservation Plan, Wilderness Areas and National Parks in Wildland Proposal, ROAD-RIP and TWP, Steve Trombulak, Jim Stritholt, and Reed Noss confront Obstacles to Implementing TWP Vision

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

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

24 Winter 1996/97 • SOLD OUT (but photocopies of articles are available). Opposing Wilderness Deconstruction: Gary Snyder, Dave Foreman, George Sessions, Don Waller, Michael McCloskey respond to attacks on wilderness. The Aldo Leopold Foundation, Grand Fir Mosaic, eastern old-growth report, environmental leadership. Andy Robinson on grassroots fundraising, Edward Grumbine on Using Biodiversity as a Justification for Nature Protection, Rick Bass on the Yaak Valley, Bill McCormick on Reproductive Sanity, and portrait of a Blunt-nosed Leopard Lizard

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

Mollie Matteson's Wolf Re-story-ation, Maxine McCloskey on Protected Areas on the High Seas

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

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

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

29 Spring 1998 • Interview with David Brower, Anthony Ricciardi on the Exotic Species Problem and Freshwater Conservation, George Wuerthner explores the Myths We Live By, forum on ballot initiatives, John Clark & Alexis Lathem consider Electric Restructuring, Paul Faulstich on Geophilia, critiques of motorized wreckreation, Mitch Friedman's Earth in the Balance Sheet, Anne Woiwode on Pittman Robinson, Peter Friederici's

Tracks, Eastern Old Growth, Connie Barlow's Abstainers

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

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

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

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Fall	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Winter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Shasta Ground Sloth

*Nothrotheriops
shastensis*



illustration by
Sarah Lauterbach

LARGE, BULKY, AND UNABLE TO CLIMB trees like their living South American relatives, the extinct Pleistocene sloths of North America were committed to the ground. Big and glacially slow in their endless search for forage, these great herbivores probably used their long muscular tongues to strip trees of their leaves, and dug tasty roots from the hard soil using forefeet equipped with huge, sharp claws.

Some of the giant sloths of the Ice Age exceeded the weight of an elephant while others, like *Nothrotheriops shastensis*, were considerably smaller, not much larger than a 400-pound, 6-foot-long black bear. In the late Pleistocene, Shasta ground sloths ranged from California to West Texas, and central Mexico north to Utah.

Sloth dung excavated from dry, remote caves in the Grand Canyon of northern Arizona gives us remarkable insight into the diet of these animals. An opportunistic browser, the Shasta ground sloth dined on many plants, including globe mallow, Indian tea, mesquite, salt brush, and yucca.

As recently as 11,000 years ago, ground sloths were still present in the Americas and likely the prey of dire wolves, jaguars, cougars, bears, and Paleo-Indian hunters of the Clovis culture. ☾

Who's keeping an eye on the Forests?

SAVE TIME AND PAPER — CHECK YOUR LABEL AND RENEW EARLY!



art ©Heather K. Lenz

Forest Watch is — and we need your help.

There are many opportunities—*right now*—to protect and restore forests—large and small, public and private—around Vermont and New England. Forest Watch is in the midst of all of them.

Last fall, for example, Forest Watch put a stop to logging on the Green Mountain National Forest in order to protect the Endangered Indiana bat. Forest Watch is a co-plaintiff in a national lawsuit to reduce and reform logging on our National Forests. And Forest Watch is leading the campaign to create wilderness as part of the Champion land deal and elsewhere in Vermont.

Forest Watch works to protect and restore wild forests, reform public land management, promote ecological forestry, monitor forest conditions, and protect imperiled species. We can't do it without you.

Forest Watch is a nonprofit, 501(c)(3) environmental organization that uses advocacy, education, negotiation, and litigation to achieve its goals. Members help to create a lasting forest legacy with their dues of \$15 and more. **Please join us**—and consider making a contribution of \$35 to support our campaign to “rewild” Vermont.

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