Rather than accept this humility, two current scholars choose to assert instead that our ideas about wilderness are now so culturally and historically mired as to have become an albatross around the neck of those who strive to conserve Nature. In “The trouble with Wilderness, or getting back to the wrong nature,” Bill Cronon (1995a, b) argues that ideas surrounding wilderness have become so encumbered with cultural and historical biases that “wilderness poses a serious threat to responsible environmentalism in the late 20th century.” This essay was excerpted prominently in the Sunday New York Times magazine, as well as appearing in the book edited by Cronon titled Uncommon Ground: Toward reinventing nature. Baird Callicott (1991; 1994a) has made similar arguments with similar (good) intentions. These authors argue that we should dispense with what they consider to be obsolete notions of wilderness in order to move the debate on to issues about how best to mesh our human culture and activities with natural environments. Both authors urge us to avoid using wilderness as a dualistic standard for judging Nature and ourselves, which, they claim, leads us to undervalue the opportunities we have nearer at hand to reconstruct our cities and countryside in a more ecologically benign manner. Cronon uses a metaphor of a tree in the garden to ask whether, by valuing distant and grand wilderness areas, we don’t devalue the “humble places and experiences” nearer to home.

These critiques come from serious scholars deeply concerned with our culture’s inability to sustain economic activities within the biological world which seems increasingly to be threatened by them. Despite Cronon’s unfortunate title, these authors also profess support for protecting existing Wilderness Areas. They choose to criticize wilderness to achieve what they consider to be broader and more important goals. It seems likely, however, that unfriendly critics will borrow their provocative statements to counter support for wild lands.

Here, I question the idea that concepts of wilderness are historically so static, or so confining, as to stymie further debate or progress on land-use issues. I will argue the opposite: that concepts of wilderness are currently undergoing a remarkable evolution to encompass a broader set of values and processes and that this broadening will increase rather than diminish the importance of wilderness values in future land use debates. Although I write as a scientist rather than as a historian or environmental philosopher, I marshal historical evidence to show that wilderness has already begun to serve a broader set of goals. I return in the end to ask how our concepts of wild and wilderness might better inform current approaches to rebuilding human settlements and restoring degraded habitats.
DO CONCERNS FOR WILDERNESS DIMINISH THE PROTECTION OF LOCAL ENVIRONMENTS?

Let us first question Cronon's initial premise: By idolizing wilderness and working for its protection do we, in fact, diminish our concern for, and protection of, nearer and more mundane environments such as our cities and farms? If so, then critics might be justified in focusing more attention on local issues and environmental justice. This premise appears to imply that our efforts to protect the environment represent a zero-sum game where additional concern for one area diminishes resources available to protect or restore other areas.

My own experience suggests that individuals who work passionately to preserve remote wild places such as the Arctic Wildlife Refuge are more rather than less likely to care strongly about their nearby forests and wetlands. While ecologically concerned citizens are inevitably torn among many worthy causes and may decide to allocate more time and energy to remote and wild areas, this should never be taken to imply that they lack interest or concern for local conditions or the welfare of their neighbors. Even those few who do loudly proclaim their "misanthropic" preference for the protection of big wild areas over other human values often do so simply to make an important point: that humans preoccupied with their own welfare and income customarily relegate only low priority to protecting wild areas. "Ecowarrior" Dave Foreman (1994), co-founder of the group Earth First!, notes that:

Wilderness advocates are not anti-people. Most of us support campaigns for human health and for social and economic justice.

Wilderness advocates also concern themselves with small, partially degraded, and local scraps of habitat. Did not John Muir plead passionately with his family to protect the small wetland on their farm (Wolfe 1945; Fox 1981)? Aldo Leopold, co-founder of The Wilderness Society and architect of the first US wilderness area, laments the "improvements" of modern agriculture in his essay "Illinois bus ride":

There are not hedges, brush patches, fencerows, or other signs of shiftless husbandry. The cornfield has fat steers, but probably no quail. The fences stand on narrow ribbons of sod; whoever plowed that close to barbed wires must have saying, "Waste not, want not."

Far from devaluing local conditions, Leopold and other wilderness leaders plead for us to extend our ecological sensibility throughout our landscapes. If concern for wilderness does not weaken concerns for local environments, where is the rationale for de-emphasizing wilderness?
THE TREE IN THE GARDEN AND THE MEANING OF WILDERNESS

Cronon concludes his essay by suggesting that we should all learn to "honor the wild" that surrounds us, including the tree in the garden which he argues is no less wild than a tree standing in an ancient forest. If we are to value wildness, then we should recognize it wherever it occurs and seek to restore it to our local environments rather than reserving it, at a distance, for special occasions.

Is the tree in the garden wild? In some senses, yes. It is derived from an unbroken line of ancestors that ultimately stretches back 3.5 billion years. Its genetic code embodies and records this evolutionary history, and it grows via the same intricate biochemical processes of respiration and photosynthesis that occur in its forest cousins. Depending on its species, our tree may also support a squirrel or two, a few birds, and legions of smaller creatures, providing an island of Nature amid yards and streets. Finally, the tree in the garden serves to symbolize the rest of Nature and, by proxy, our relationship to it.

Despite these similarities, however, the tree in the garden differs in several profound ways from a tree growing in a forest. The birds in this tree's branches, the lichens on its bark (if, indeed, there are any), and particularly the nematodes, fungi, and bacteria that thrive around its roots are hugely different in number and likely in kind from those of any comparable tree growing in a forest. Furthermore, its flowers, fruits, and seeds face a far different fate (often death) due to a lack of appropriate pollinators and dispersers and the scarcity of "safe-sites" for germination and establishment. In sum, the tree in the garden is no longer wild because it has been removed from its ancestral ecological and evolutionary context. To paraphrase the poet Goethe's phrase "Ein Mensch ist kein Mensch": a tree removed from its context is not really a tree. While it may persist as an interesting artifact, its future is oblivion—unless, of course, it happens to be a weed tree well-adapted to growing in cities, in which case its evolutionary prognosis may be excellent, at least in the short term.

Arguments over the meaning of wild, natural, and wilderness would seem academic and semantic except for the real implications they carry for how we manage our lands and waters. Cronon and Callicott fault our historic tendency to draw dichotomies of wild vs. tame, natural vs. unnatural. They remind us that with global climate change and the long-distance transport of heavy metals, persistent pesticides, and other pollutants, no area on Earth remains pristine or free of human influence. But does this diffusion of human impacts throughout our biosphere mean that we have lost the logical basis for protecting remaining forests, prairies, and estuaries? If nothing remains that is truly wild, and if humans are integral parts of the systems we seek to protect, how can we establish criteria to evaluate human behavior? What boundaries shall we place upon our own tendency to expand and subvert other biotic systems to our own ends? Shall we establish parks to protect rock quarries, dammed rivers, and hog farms? Shall we do whatever we please on the land and in our rivers and lakes as long as we agree to label these effects "natural?" These are the dilemmas posed by environmental relativism, now echoed in the reactionary press.

To avoid falling into either the trap of dualism or the quicksand of environmental relativism, we must recognize that degrees of wildness exist. Cronon begins his essay with Thoreau's famous assertion that "In Wildness is the preservation of the World," but he then abandons wildness to discuss the historical and cultural roots of our ideas about wildness instead. If wilderness is, admittedly, a very human construct laden with cultural meaning, wildness is just the opposite: that which is not, and cannot be, a human construct. Wildness existed before human cultures expanded and will exist long after human cultures have vanished. Wildness also persists in many

Illustration by Laura Luzzi
corners of our acculturated cities and farms and within ourselves. However romanticized and idealized our notions of "wild" and "wilderness" are, there is and always will be a gap separating the artificial from the wild—the "otherness" that Cronon refers to.

Fortunately, we can define "wildness" in terms that are much less prone to misinterpretation and misuse than our use of "wilderness." Let us define an organism's, or a habitat's, wildness in terms of its ecological and evolutionary context, i.e., its habitual relationships to other organisms and the surrounding environment. For an organism to be considered "wild" (and often to persist at all) it must exist in an ecological context essentially similar to the one its ancestors evolved in. Importantly, this is not necessarily a context that provides the best survival rates or most individuals of a species, but rather one that permits persistence according to historical ecological dynamics. Any species exists only as a population of individuals, the separate survival and reproduction of which are themselves far less important than the viability of the meta-population (or lineage) as a whole. To persist, most wild species need relatively intact habitats that retain historical patterns of disturbance, connectivity, and ecological interaction. Habitats, then, also exist in degrees of wildness according to how greatly these patterns have been disrupted or displaced. This definition is explicitly historical in the sense that it stipulates a continuity (but not stasis) in reigning conditions. To ignore this evolutionary history by assuming that organisms can readily adapt to live in the radically altered environments we construct reflects biological ignorance, remarkable hubris or both.

Under this definition, isolated organisms removed from their natural context as we find in zoos and botanical gardens can never be considered wild. They lack the most crucial aspect of their identity, namely their interactions with natural habitats including conspecifics and the vast number of other species that constitute the world in which their ancestors evolved. Any plant or animal plucked from this context plays a far weaker ecological and evolutionary role. Such plants and animals demand external feeding and propagation, experience artificial breeding and selection, and are unlikely to leave any long-term evolutionary legacy. While such organisms, like the tree in the garden, will always retain vestiges of their wild evolutionary past, they also are prone to fundamental changes in character, as occur in domesticated plants and animals. A Chihuahua is no wolf, even if they share some of their genome, and deserves no protection from Defenders of Wildlife.

If Cronon had been writing about the state of wilderness instead of our use of wilderness concepts, he surely would have made a different set of points. Perhaps he would have noted that no other large animal has ever existed on Earth in such vast numbers with such profound impacts on so many ecosystems (Vitousek et al. 1986). He might have joined top scientists like E.O. Wilson, Peter Raven, and Paul Ehrlich in emphasizing the appalling scale and irreversible nature of losses to biodiversity across the globe. Cronon might also have reported that only 11% of the world's lands remain wild, that only 3.9% of the US is protected as National Parks or designated Wilderness, or that our country has actually paved over more land than we have protected under Wilderness designation (Callicott 1994a). He might also have stressed how miserably our European ancestors failed to protect the original forests and prairies they encountered. We might have wished that a prominent scholar speaking to the subject of protecting the near and mundane would stress how imperiled even small remaining scraps of wild Nature are in today's political climate, where neo-conservatives rush to dump decades of legislation protecting rare species and habitats, accelerate mineral resource development in wildlife refuges, sell off entire National Parks, and accelerate the logging of old-growth forests under the pretense of "forest health."

CHALLENGES POSED BY ECOLOGICAL CHANGE

Environmental relativism also crops up surprisingly often in the context of ecological change. Both scientists and laypersons have long assumed that Nature, left to its own devices, reaches a balance or equilibrium. Early descriptions of ecological succession stressed the ability of many biotic communities to rebound from disturbance by passing through a predictable succession to converge on a stable "climax" community. Such ideas are also frequently associated with notions of ecosystem recovery or repair. More recently, ecologists have questioned ecological stability and convergence and have instead stressed the dynamic responses of plant and animal communities to disturbance and secular changes in environmental conditions (Pickett & White 1985). The ecologist Dan Botkin (1990) popularized this paradigm shift within ecology and termed the acceptance of non-equilibrium ecological dynamics "the new ecology." This academic paradigm shift might have gone unnoticed except that more popular writers such as Chase (1986), Callicott (1991), and Easterbrook (1995) leapt on these ideas to argue that our traditional notions of Nature are too static to suitably represent actual ecological conditions. Some of these authors went further to argue that because ecological change is unpredictable and often lacks set equilibria, we therefore have no guidelines to evaluate the status of ecological communities or our own management. Industries such as the Mobil Corporation have quickly capitalized on such ideas, quoting the ecologically dubious ideas of Easterbrook (1995) to assert that "the notion of a fragile environment is profoundly wrong... The environment... is close to indestructible." Similarly, Proctor (1995) in an essay in Cronon's book interprets the lack of any balance in Nature to imply that there is no ecologically (or ethically) correct way to manage old-growth forests in the Pacific Northwest.
While ecological dynamics are an obvious challenge in many situations, it is seriously misleading to argue that ecological change is so disordered or random as to preclude any coherent or consistent approach to management. In fact, most ecological disturbances are rather predictable and form an integral part of managing those ecosystems. Ecologists, conservationists, and some land managers have long accepted these roles for disturbance within natural systems and incorporated this understanding into land management. Thus, those managing prairies and barrens vegetation routinely use fire, and those concerned with floodplain habitats and fish stocks strongly advocate approximating historical patterns of flooding. While professional disagreements often occur, few natural areas managers dispute the critical role such disturbances play in perpetuating the conditions necessary to sustain native species. Even two-thirds of a century ago, Adams (1929) concisely dispensed with the straw man of stasis in the context of preserving natural values:

Thus, when ecologists emphasize the need of setting aside reservations for the preservation of natural conditions they do not mean, and certainly do not expect, the conditions to remain indefinitely “balanced,” fixed and unchanged or unchanging, because they know that it is utterly impossible, both theoretically and practically...to keep it free from all outside influences.

Human activities, however, in many instances cause ecological change too extreme in type or speed for native species to adapt or rebound. We continue to discover fresh ways that dozens of species are displaced or extinguished by profound changes in historical patterns of disturbance (e.g., dams and flooding, fire suppression, heavy logging in ancient forests). We must recognize the real and immediate ecological threats posed by such alterations and distinguish carefully between historically dominant and more novel types and patterns of disturbance. The threats here lie in the nature, rate and extent of change rather than the occurrence of change per se. Similarly, we can use these differences to distinguish degrees of wilderness among remnant habitats. With care, habitats can often be nudge back in the direction of greater, rather than depleted wilderness, increasing the ability of these areas to retain species. Our job, then, is to recognize vectors of change in response to changes in internal and external conditions. We must then improve our abilities to favor those ecological changes that promote, rather than diminish, wild conditions (i.e., those capable of sustaining the species that historically occupied these habitats).

It is therefore absurd to claim that any changes we precipitate in the lands and waters around us are as natural and acceptable as any other. Botkin (1991), Alverson et al. (1994), and other ecologists argue specifically that to accept ecological change as inevitable does not imply that we should accept any kind of change. Real differences in conservation value exist among different areas (and thus among human actions affecting these areas). Lands also plainly differ in the degree to which their original biotic value has been degraded by direct or indirect human influence and in the opportunities we have to conserve what biotic value they retain. Once we accept that lands differ in conservation value, then we must also accept the protecting certain areas from further degradation is far more significant than protecting other areas.

ESTABLISHING BIOTIC VALUE IN AN ERA OF RELATIVISM

What is this biotic value? Can it be defined unambiguously in scientific terms, or are we merely substituting one metaphysical concept, now cloaked in the garb of science, for the metaphysical awe and reverence that Cronon documents as the legacy of wilderness? Most conservation biologists agree that criteria for biotic value must be developed for prioritizing the conservation value of various lands, usually on the basis of an area’s ability to help sustain native biological diversity. In fact, such assessments have been routine for years. The Nature Conservancy has set as its explicit goal the identification, purchase, and permanent protection of natural areas with the highest biotic value. They routinely rank species and community types according to quantitative criteria and assemble these data in their Natural Heritage databases (Noss 1987). Quantifying the biotic value of lands is also central to the routine business of writing environmental impact statements and to identifying critical habitat under the Endangered Species Act (ESA). In fact, assessing the biotic values for habitats of endangered species has become more important under Section 9 which allows “habitat conservation plans” to substitute for absolute protection of all suitable habitat (Beatley 1994).

Few conservation biologists are shy about devising scientific criteria to estimate biotic value, or doubt their importance in conservation. We rarely concern ourselves with questions regarding what is truly “natural,” “stable,” or “pristine,” and consider debate over such matters to be empty. This is not to say that developing biotic criteria for conservation is simple or free of controversy. Our doubts and concerns are many, but they revolve chiefly around how unsure we are about levels of threat and the manifold effects of human management actions. We also accept that our scientific criteria can never be purely objective or free of cultural bias. That they are artifacts of our culture, however, in no way implies that what they seek to describe or quantify is an artifact or culture-bound. Species will persist and thrive or decline to extinguish in response to human activity, and there is nothing remotely subjective about the permanence of their extinction. Indeed, it is the epic proportion and rapidity of these losses that drives us to make the many imperfect judgments we must in deciding which areas most deserve protection.
SCIENTIFIC VALUES FOR WILD LANDS

Cronon ably describes how human values for wilderness (scenic grandeur, the chance to test oneself against primitive conditions, sublime beauty, etc.) have shifted historically. The presence of so many shifts, he argues, has left us with so many culturally inappropriate notions of wilderness as to make the idea misleading, divisive, and therefore counterproductive. Ironically, this argument comes just at a time when an entirely new set of concerns for wild lands has come to the fore to reinvigorate the wilderness movement. In particular, justifications and criteria for preserving natural and wilderness areas are turning away from scenic and recreational values to address instead the biotic values that wild lands sustain (Alverson et al. 1994, Noss & Cooperrider 1994, Waller 1996). One might agree or disagree with Cronon's thesis that human values for wilderness have become obsolete, but the essay does little to inform the reader of how our notions of wild lands are expanding in the late 20th century to encompass this new realm of values and urgent justifications. These shifts have, in fact, given traditional concerns for wilderness a new lease on life and placed the designation of wild lands at the forefront of conservation thinking and action.

The science of conservation biology emerged as ecology, systematics, and wildlife biology struggled to confront the threats to both individual species and biological communities. As this science has progressed quickly in recent years, a surprising number of independent, yet interrelated, scientific justifications for conserving large and undeveloped lands have emerged (Alverson et al. 1994). For example, many of the ecological interactions crucial for sustaining plant and animal species depend critically on how large, connected, and intact areas of habitat are. Smaller natural areas and those subject to human disturbance tend to lose a substantial fraction of their species via several distinct mechanisms even if they appear initially to be of high quality. Most obviously, large wide-ranging carnivores and ungulates sensitive to human activity require extensive home ranges and quickly disappear from smaller or fragmented habitats. Many smaller species of amphibians, mammals, and plants are also quite sensitive to human disturbance or human alteration of natural disturbance regimes. Species may be incapable of dispersing across open or inhospitable habitats such as roads, dissecting their populations into smaller subunits which are increasingly vulnerable to genetic and demographic hazards. Neotropical migrant songbird species have suffered serious declines across eastern North America in apparent response to cumulative habitat losses.

Gambel's Quail sheltering in chained junipers, Arizona by Bob Ellis
and fragmentation. As edge habitats have increased, the nest predators and parasites favored by such edges have also increased, drastically reducing nest success. Smaller areas are also less able to sustain historically dominant patterns of natural disturbance (e.g., fire and wind throw), causing further losses of species dependent on these disturbances. In their stead, farming, roads, channelization, and other forms of development enhance opportunities for the weedy and often exotic species that increasingly dominate our landscapes, further displacing many native species. While many of these changes are delayed or tend to occur slowly, their collective impacts have already been dramatic. Their future impacts will likely be catastrophic.

Thus, habitat loss, fragmentation, and other forms of degradation represent clear and present threats to a large fraction of our already impoverished biota. All these phenomena strongly support a consistent approach to conservation that emphasizes the preeminent need to maintain large and/or connected wild areas relatively free of human disturbance. Only such areas are capable of supporting larger, more viable and interconnected populations of rare and threatened species and perpetuating the ecological processes that sustain other elements of biodiversity. While some elements of diversity may be sustained in smaller areas, and certain species clearly need particular habitats, most conservation biologists readily agree on the fundamental importance of protecting large blocks of suitable habitat as a first defense against further species losses. While Cronon and Callicott (1991, 1994) criticize wilderness designations for their “man vs. nature” dichotomy and the alienation it promotes, many species sensitive to habitat loss and disruption demand such separation if they are to survive at all.

Although conserving wildlife has always existed as an accessory justification for wilderness, few of our Wilderness Areas and only one of our National Parks (Everglades) have been expressly designated to preserve biotic values. In addition, scientific and lay concerns for these biotic values have themselves expanded from a few vertebrate species (the “charismatic megafauna”) to embrace broader concerns for biodiversity. These findings have also recast the agenda of many conservation organizations, including The Nature Conservancy.

How do scientific approaches to conservation accord with more traditional approaches to managing wilderness? Large, relatively undeveloped areas with low road density are correspondingly wild in aspect and suitable for both Wilderness designation and protecting biotic values. Although backcountry recreation has been, and continues to be, a major justification for designating these areas, Wilderness Areas are managed to reduce human activities and disturbance. Thus, in many respects, goals for Wilderness Areas mesh well with the goals of conservation biology. This is not always the case, however, particularly since traditional Wilderness Areas have usually been placed in habitats of little economic value, such as mountainous regions or deserts. While “rock and ice” locales clearly serve aesthetic and recreational ends, they conspicuously neglect lowland areas and biologically productive habitats that collectively sustain far more species. This shortcoming, though, reflects historical contingencies rather than any deficiency in the wilderness concept itself. If they are to serve an increasingly biotic role, future wilderness designations should focus on lowland forests, prairies, and wetlands that are so conspicuously absent from our current system.

Some critics argue that aspects of the designation process limit the number and location of Wilderness Areas and constrain their management. Rather than allow wilderness to serve only as a weak vehicle for protecting biodiversity, perhaps we should pursue different designations aimed explicitly at this goal. For example, the UN designates Biosphere Reserves around the world intended to protect biodiversity. Similarly, Solheim et al. (1987) and Alversion et al. (1994) used biotic principles to design “Diversity Maintenance Areas” (DMAs) for Midwestern public lands. We invented this term and devised an independent set of management principles for these areas to deliberately distance our proposals from conventional wilderness areas in this region. This, however, was a judgment that we consider particular to this situation. We also see virtues in broadening the wilderness concept:

The merits of associating ecosystem protection with wilderness lie in their very close interconnection in fact, the centrality of a hands off policy for achieving biotic health, and our proven willingness as a society to take strong legal measure to protect lands of exceptional value, called wilderness, for nonmarket reasons. These hallmarks of wilderness would well serve biodiversity (Alversion et al. 1994, p. 243).

To allow for differences in primary purpose and styles of management, we could establish different categories of wilderness. Interestingly, Aldo Leopold also came to accept scientific justifications for wilderness (Meine 1988). After initially justifying wilderness primarily for its contributions to recreation (Leopold 1921), he embraced a broader set of cultural and historic values (Leopold 1925) before finally arriving in his essay “Wilderness as a Land Laboratory” at the idea that the most critical role for wilderness was the scientific one of serving as a control to judge the effects of human impacts (Leopold 1941).

Although justifications for Biosphere Reserves and DMAs are based strictly on science rather than the grandeur of scenery or the romantic opportunity to prove oneself in a wild and remote setting, Cronon questions whether biodiversity truly represents a scientific value:

Although at first blush an apparently more “scientific” concept than wilderness, biological diversity in fact invokes many of the same sacred values. (p. 81)

Here, the essay appears to argue that biological criteria for wilderness serve merely as a cover for deeper individual motives that remain at base metaphysi-
cal. In light of such criticism, we must make a concerted effort to distinguish the coherent and powerful scientific rationale we have for conserving wild areas from other more immediately self-serving human values.

ARE SCIENTIFIC AND TRADITIONAL HUMAN VALUES FOR WILDERNESS COMPATIBLE?

By suggesting that scientific arguments act as a cover for sacred values, Cronon seems to imply either that scientific justifications are insufficient or that moral and scientific justifications for wilderness are somehow incompatible with one another. Such positions are at odds with the personal history of many of the individuals most directly involved with the wilderness movement in America. Is it simply a coincidence that so many of these individuals were excellent field naturalists? One could start with Thoreau and recall his patient and perceptive observations of ant warfare, the details of tree dispersal, and the process of ecological succession (a term he apparently coined). One might also consider John Muir who, as the Archbishop of Nature worship in the late 19th century, must be considered to be at the center of those ascribing sacred values to wild lands. Yet this is the same man who began his career as a successful inventor and machinist, gained college training in botany and geology, and convincingly demonstrated the glacial origin of high Sierra valleys in California such as Yosemite (Fox 1981, Wolfe 1945). Finally, Aldo Leopold was a scientist of considerable stature as well as a major spiritual and moral leader of modern environmentalism. This remarkable man moved seamlessly from justifying wilderness primarily on recreational grounds to more holistic points of view where land and species should be protected according to our best scientific understanding for both scientific and ethical reasons. More than any other individual, Leopold embodies the philosopher-scientist who sought, and found, deep resonance between his commitment to scientific and moral principles.

It is also instructive to consider the contemporary example of Dave Foreman, a founder of Earth First! and chief spokesman for "The Big Outside." In his Confessions of an Ecowarrior, Foreman (1991) traces the evolution of his own thinking and moral stances relative to conserving wilderness. Interestingly, despite a personal history rich in wilderness exploration and defiant moral stands on behalf of wilderness, Foreman settled firmly on biotic justifications for wilderness as being most appropriate in the sense of being both scientifically sound and morally defensible. Indeed, he now spends much of his effort extending and defending concepts of wilderness explicitly in the context of protecting biological diversity (Foreman 1994) and working with biologists to promote the ambitious Wildlands Project (Foreman 1992).

The concordance between conservation science and moral values emerges forcefully in what has been termed the "New Conservation Movement" (see other issues of Wild Earth, especially volume #2). This movement has arisen in direct response to the emergence of conservation biology and the accompanying realization that conventional approaches to conserving wild lands based on scenic beauty or the potential for rugged recreation are failing to adequately protect species diversity, particularly in species rich habitats with little scenic or recreational value. These twin developments are related, of course, in that conservation biology provides a strong scientific basis for the new conservation movement and that both recognize the special importance of habitat area, landscape context, and biotic interactions for conserving biodiversity. Although some environmentalists have yet to embrace this shift, it is an increasingly dominant theme within many conservation organizations. It is noteworthy that leading conservation biologists such as Michael Soule and Reed Noss spearheaded The Wildlands Project.

The concordance between conservation science and moral values emerges forcefully in what has been termed the "New Conservation Movement."
Thus, many of the chief proponents of wilderness have been expert naturalists who draw on their intimate familiarity with the subtlety and nuance of natural systems to argue persuasively for conservation. Although inclined toward science, most of these individuals freely invoke moral or spiritual bases for the protection of wild lands without considering such arguments to be in any way antithetical to their scientific outlook. Perhaps their deep understanding of wild species and natural events contributed to their moral perspective rather than vice versa. One might argue that scientific rationales for protecting wilderness are also mired in a particular cultural and historical context, but it would be difficult to argue that biotic values are more parochial than recreational values. Rather, it would appear that biotic justifications for wilderness represent a significant extension of ethics and mesh well with more traditional values such as aesthetics, recreation, or personal redemption. Furthermore, biotic values have gained cogency due to escalating threats to species diversity and biotic systems. At the same time, scientific arguments for conservation benefit from increases in our knowledge regarding how biotic systems respond to various human-induced assaults.

PROSPECTS FOR ECOLOGICAL RESTORATION

Rather than posing a serious threat to responsible environmentalism, I have argued that wilderness defined as large, connected, and relatively intact ecosystems should form the backbone of any ecologically informed conservation program. If there is a trouble with wilderness, it is that we do not have enough of it and that we continue to devalue it as we have historically. Cronon and Callcott propose that we expand upon this meager base by granting greater value to the Nature that persists in our nearby fields, forests, and cities and examining how our everyday lives affect this Nature. This is, of course, natural and useful. Surely wilderness is now too scarce to represent a vastness to be loathed and conquered; and Wilderness Areas are far too valuable, for ecological and social restoration, to be marginalized as representing only arenas for outdoor recreation or romantic icons of an earlier cultural era. Their value stems instead from the ecological integrity they embody. One cannot find this integrity in “the tree in the garden,” severed as it is genetically from its conspecifics and ecologically from other species. One has difficulty even finding it in 40 and 80 acre remnant patches of forest or prairie. We must accept the very real differences that exist in the degree of wildness of the lands and waters around us and use the better examples as foci to begin the important work of restoring more Nature to our cities and countryside. To blame wilderness for the concepts others have heaped on it is to blame the victim instead of the aggressor.

The intent of authors like Cronon and Callcott is to clear away obsolete perspectives and so prepare the way for the serious business of devising more politically feasible ways to live benignly on the land. These authors are worried that, by expending so much time and effort on what they see as the narrow issue of wilderness, America has compromised its ability to enrich and restore our more mundane habitats. While I have questioned the presumption that worrying about wilderness prevents us from valuing nearer and plainer habitats, I do not question the importance of learning how better to manage human disturbed landscapes. Like most conservation biologists, I join Leopold and Meine (1992) in suggesting that:

*a mature conservation/environmental movement will work across the full spectrum of land types, from the wild to the semi-wild to the cultivated to the settled to the urbanized, and will recognize the relevance of each to all the others.*

These goals will demand the best of our science to determine what will, and what will not, suffice to conserve species diversity. They also demand firm commitment of our values. As we approach these difficult tasks, however, we should be catholic about accepting notions compatible with our general goals. Similarly, we should avoid both artificial dualisms and environmental relativism, which ignores the clear differences in conservation value that exist among lands according to their location, the species they support, and their past history of management.
As conservation moves away from its historical job of simply preserving the best remaining natural habitats to encompass the broader work of managing and restoring a full spectrum of natural communities, we face a host of questions regarding active versus passive management. It may be unsafe to assume that, left alone, natural areas will recover and sustain biodiversity. In some cases, we must accept the responsibility for various forms of active management and restoration. In doing so, however, we must be careful to test our ideas as we go by applying our management and restoration efforts in the form of experimental treatments in a process now termed "adaptive management." For both economic and ecological reasons, we should strive to apply the slightest touch possible. Here, it is important to recognize that smaller and/or more degraded areas usually require far more active efforts to manage and restore their natural values than do larger areas (Alverson & Waller 1992). This itself constitutes a powerful argument in favor of conserving large areas free of chronic human disturbance.

Ecological restoration has sometimes been compared to gardening. The difference between restoration and gardening lies in their goals. For gardening, this is clearly the artifice of some aesthetic ideal. For ecological restoration, our goals are more subtle and complex, namely creating habitat for native species and restoring the ecological processes that sustain those species. While many restored areas are too small or fragmented to sustain full complements of the species that originally inhabited them, they serve well to remind us, like the tree in the garden, of the larger biotic context of which they, and we, are a part. We must never confuse such small synecdoches, however, with the wilder habitats they only represent. We share our planet with myriad other forms of life, many of which demand large and ecologically intact habitats to survive. If we are to accept Cronon's suggestion to encompass all areas, from the city to the wilderness, as "home," let it be a home that we are willing to share generously.

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