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on the Ground

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FOR A GROUNDED CONCEPTION OF WILDERNESS AND MORE WILDERNESS ON THE GROUND

PHILIP CAFARO

ABSTRACT

Recently a number of influential academic environmentalists have spoken out against wilderness, most prominently William Cronon and J. Baird Callicott. This is odd, given that these writers seem to support two cornerstone positions of environmentalism as it has developed over the past twenty years: first, the view articulated within environmental ethics that wild, nonhuman nature, or at least some parts of it, has intrinsic or inherent value; second, the understanding developed within conservation biology that we have entered a period of massive anthropogenic biodiversity loss and that landscape-level habitat preservation is essential for combating this. I argue here that Cronon and Callicott are wrong. In fact, an ethics of respect for nonhuman nature and an informed, scientific understanding of what is necessary to preserve it do strongly support increased wilderness preservation.

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INTRODUCTION

A wilderness, on one important definition, is a place which remains largely unmanaged and unmodified by human beings. Due to increased human numbers and technological power, only places mandated by law will remain as wilderness in the coming centuries. If we wish to allow nature to remain wild in select areas, political authorities must set boundaries within which human numbers and human uses are limited, and direct economic uses are largely excluded. For wilderness advocates this human restraint indicates proper respect for these places and for the individual organisms and biological communities they protect.¹

Recent discussions concerning the word 'wilderness' and its cognates have been valuable and interesting, elucidating their varied and overlapping meanings: objective, subjective, evaluative, and, not least, statutory (Bennett and Chaloupka 1993; Rothenberg 1995). Objectively, 'wilderness' has meant (and may mean) a place not inhabited by humans, a place inhabited by wild animals, a place unmanaged by humans, a place unmodified by humans, a lawless place, a violent place. Subjectively, 'wilderness' and 'wildness' describe feelings and experiences of freedom, power, threat, unpredictability, lack of control, Edenic beauty, dreary cheerlessness, difference, and otherness. Evaluatively, 'wilderness' has positive and negative connotations and may also be used as a value-neutral term. Statutorily, wilderness areas are unmanaged areas, areas actively managed to preserve wild nature, and areas where certain human activities are prohibited.

Such analyses help us to understand the motivations of wilderness proponents, for precisely this complicated interplay of meanings—experiences of freedom and power in unmanaged nature, actual wild places as symbols of purity, and so forth—has allowed wilderness to work as a motivating ideal, for some. Yet it is important to realize that a fuller understanding of the concept, including its subjective and evaluative components, does not undermine its objective use. 'Wilderness' may still mean a place unmodified by humans and be used to make true or false statements about particular places. Similarly, the recognition that different objective uses of 'wilderness' pick out different aspects of reality renders the concept ambiguous but not unworkably so, for again we can differentiate between these different senses and use them to make true or false statements about the world. The Yosemite Valley was a wilderness 40,000 years ago, in the sense that human beings did not live there, but not in the sense that it was chaotic; a

nonhuman order existed. The Northern tall grass prairie region where I once lived was largely unmodified by humans 1,000 years ago, but it was not a wilderness in the sense that no humans dwelt there; a few did. Large parts of Everglades National Park are essentially unmanaged, yet past and current activities outside the park have drastically modified its flora, fauna, and hydrological regime.²

CRONON'S "WILDERNESS" DECONSTRUCTION

Some "post-modern" critics see objective, referential uses of 'wilderness' as inherently misguided (McQuillan 1993). We may safely dismiss their criticisms, since if true they would undermine all objective language use, 'tree' and 'red' no less than 'wilderness.' Historian William Cronon seems to accept such referential uses, at least in principle. But he undermines the objective senses most important to conservationists: 'wilderness' as a place largely unmodified by human beings; 'wildness' as a quality of species and individual organisms specifying a degree of independence from human control, historically or currently. Aware of the power of language to shape our perceptions, of perceptions to shape actions, and of actions to shape the landscape, Cronon pronounces wilderness an illusion, and a dangerous illusion at that.

In his influential article, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature," Cronon (1996) argues that "the more one knows of its peculiar history, the more one realizes that wilderness is not quite what it seems" (69). He plausibly ties the growth of America's 19th-century wilderness preservation movement to a romantic conception of wilderness which saw wild nature as an opportunity for epiphany or connection to an unfallen "other." "The romantic legacy means that wilderness is more a state of mind than a fact of nature," he writes, "and the state of mind that today most defines wilderness is *wonder*" (88). This wonder is directly connected to a sense of otherness, Cronon believes, yet this can and should be evoked much closer to home: "The tree in the garden is in reality no less other, no less worthy of our wonder and respect, than the tree in an ancient forest that has never known an ax or a saw" (88). We must "broaden our sense of the otherness that wilderness seeks to define and protect," Cronon writes, and bring an ethic of respect into all our dealings with nonhuman nature: "Indeed, my principal objection to wilderness is that it may teach us to be dismissive or even contemptuous of . . . humble places and experiences" (86).³

Now the assertion that wilderness experience or wilderness advocacy lead to complacency toward urban and rural environmental issues is not born out by the facts. The same organizations and individuals often attend to both. Still, Cronon's penultimate point is correct: we do need to cultivate better relationships to the plants, animals, and places that are near to us, for their sakes and ours. Yet part of treating others respectfully is attending to who or what they are, and when we do so we see that while Cronon's two trees are both clearly other than us, they are also quite different from one another. The one grows where it does through chance, competition, ecological succession; the other because I planted it there. The one possesses a genome created through natural selection acting over millions of years; the other may be the product of this and of generations of horticultural trial and error; or of these, plus direct genetic engineering. In these and other ways the tree in my garden, while no less other, is less independent from me and from humanity. It is in certain ways an artifact. Similarly, a forest may be more or less wild, although we should not assume that the distinction between wild and managed forests will be sharp or cut solely along one line.⁴

It is plausible that wild beings' autonomy grounds a strong duty of noninterference toward them, enjoining greater restraint than we are obligated to show toward domestic animals and plants. I am not sure about this.⁵ But to the extent that a nonarbitrary answer may be given here, it must be found in a consideration of the particular natures of the various others we are considering, rather than in an abstract consideration of Otherness. For I am fairly sure that I have different responsibilities toward women and trees, even though they are both other than me. I may not saw off women at the knees to build a house, and any convincing explanation of why I may not do so will refer to what women are and will not refer to the sense of wonder they evoke in me. Indeed, to linger over my feelings in such cases is to decline ethical investigation and relationship. Ethics presupposes objectivity: we may know with whom we deal, however imperfectly, and act accordingly.

Assume, for the sake of argument, that both wild and tame organisms equally deserve respectful treatment. If so, that treatment will still differ based on their different natures. We should feed and walk our dogs regularly, pat them on the head, and spend time with them. Their health and happiness depend on it. But we should not feed or romp playfully with wolves, for they do not need it. In fact, they cannot remain wolves if we do

so, but are on the way to becoming dogs. “Learning to honor the wild—learning to remember and acknowledge the autonomy of the other—means striving for critical self-consciousness in all our actions,” Cronon writes (89). But this ignores the distinction between those entities that we treat well by taking care of them and cultivating close personal ties, in a process whereby they and we lose some autonomy; and those entities that we treat well by restraining our very human desire for relationship, appreciating them at a distance and setting up places where they can be largely free from us.

We may call such places wilderness areas: places where permanent human habitation and direct economic utilization are off-limits or severely circumscribed. At times, Cronon comes close to acknowledging the importance of such statutory wilderness in protecting wild places and species, but each time he perversely undermines consideration of this issue. “Leaving aside the legitimate empirical question in conservation biology of how large a tract of land must be before a given species can reproduce on it,” he writes, in one of several such passages, “the emphasis on big wilderness reflects a romantic frontier belief,” and so forth (89). But this sort of empirical question is precisely what conservationists must not leave aside, because answering it correctly is key, not to our getting our own concepts in order, but to saving species themselves, a task which is infinitely more important.

Here the results from conservation biology are clear (Noss and Cooperrider 1994; Laurance and Bierregaard 1997; Primack 1998). Wild areas preserve greater numbers of native species than areas managed for agriculture or forestry. Large protected areas are more likely than smaller ones to preserve a full complement of species in the face of the chance extinction of individual populations. Some species need large areas of habitat to preserve minimum viable populations. Some species tolerate little human disturbance. Larger areas are less likely to suffer “edge effects” which render otherwise good habitat unusable by certain species.

Big, statutory wilderness is necessary (but not sufficient) to preserve biodiversity. Yet Cronon writes dismissively that “wilderness is the place where, symbolically at least, we try to withhold our power to dominate” (87). Symbolically? No. Statutory wilderness areas are places where we do withhold our power to dominate, where laudable intentions cash out into actual restraint on the ground. Cronon calls this “the myth of wilderness . . . that we can somehow leave nature untouched by our passage. By now

it should be clear that this for the most part is an illusion" (88). On the contrary, the illusion is that there is no real difference between wild and managed nature, or between the effects of a few thousand backpackers and elk hunters in Montana's Bob Marshall Wilderness and industrial road building and tree harvesting on adjacent portions of the Flathead National Forest. Only if we make such distinctions can we hope to act rightly and effectively as conservationists. For the animals, plants, and places involved, wilderness protection often means the difference between preservation and destruction.

Similarly, we cannot understand those "changes in the land" which Cronon himself has shown are an important part of human history, without a robust conception of wilderness. Surely our progressive taming and domination of many of Earth's natural landscapes is an important historical theme. Ecologists, anthropologists, and historians are working to tell earlier chapters of this story accurately and in detail; they could not do so without a sense of how powerful human influences have been relative to benchmark pristine or natural ecosystems.⁶ At the millennium, wilderness has largely disappeared from the face of the Earth, but it once was the face of the Earth. That is no illusion.

To be fair, Cronon's position stems from a desire to articulate a harmonious relationship between humans and the rest of nature. Wilderness, in theory and practice, seems to segregate humans from nature, while Cronon wants to articulate a philosophy where we fit in. Such an environmental philosophy is emphatically needed, and it is one reason why wilderness preservation cannot be the whole of environmentalism. But just as fitting into a family or human community involves respecting others' privacy, so fitting into natural communities involves some measure of self-effacement. The fact is that every human (and other) being takes from the earth and displaces a part of the rest of creation. In our current numbers and modes of consumption and production, humans take and displace hugely. If we wish to protect nonhuman nature, we must limit our numbers and our effluents and set up statutory protected areas where we limit these yet further.

"The wilderness dualism tends to cast any use as *ab*-use," Cronon complains (85), but this is true only for uses within wilderness areas which significantly alter them; such uses are by definition prohibited.⁷ Obviously, wilderness areas cannot encompass the whole surface of the Earth, and

altering nature may be permitted and even celebrated in other places. Relatively harmless human activities are permitted within wilderness areas themselves, including many which are less and less frequently available outside them. These range from mountain climbing and river running to quiet meditation away from the glare and squawk of industrial civilization. Wilderness designation curtails direct economic use, but preserves wild nature as a scientific, recreational, aesthetic and spiritual resource for future generations (Rolston 1994; Kellert 1996).

CALLICOTT'S HOME IMPROVEMENTS

Another recent critic of wilderness, J. Baird Callicott, also confuses and undermines objective uses of 'wilderness'. The U.S. Wilderness Act of 1964 states that "a wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." According to Callicott, in "The Wilderness Idea Revisited: The Sustainable Development Alternative," this definition assumes . . . a bifurcation of man and nature . . . [human beings] unique and set apart from nature . . . the radical metaphysical rift between us and the brute creation" (Callicott 1991a, 240). Since Darwin, however, we know that human beings are a part of the brute creation. So, in our alterations of the environment, "man is a natural, a wild, an evolving species not essentially different in this respect from all the others" (241). The use of the term 'wilderness' indicates conceptual confusion, since it is based on a faulty dualism between putatively unnatural humans and non-human nature. For this reason, among others, wilderness preservation should be replaced by sustainable development, biodiversity preservation, and the maintenance of ecosystem health. These are our proper environmental goals.⁸

But no metaphysical confusion or mistake need arise in presupposing an important difference between humans and nonhuman nature. While the wilderness proponent is committed to the position that there is a real and important difference between wild and managed ecosystems, he or she is not necessarily committed to any of the following: that there is a sharp line between wild and managed ecosystems; that there is one single way to distinguish them; or, that this is a fundamental divide which is not bridged by yet broader metaphysical categories.

One can, for example, hold a naturalistic ontology in which all being is natural in some fundamental sense (not supernatural, or part of one all-encompassing material universe) yet still distinguish between lands which have a history of human habitation and those which do not; lands which have a history of modification by industrial age machinery and those which do not; lands which have been modified by humans in the last 200 years and those which have not; lands which support the same species that they would have supported in the absence of human intervention and those which do not.⁹ In none of these cases would we be able to draw a sharp line which divided all lands on the surface of the earth into two distinct categories (Botkin 1990). Even if these distinctions were specified more precisely, complications would persist. But that is acceptable. We distinguish species of oaks despite some hybridization; we distinguish men from women despite hermaphrodites, transvestites, and transsexuals. Only through such distinctions is a real appreciation of an “other” made possible, which includes both understanding and respectful treatment.

Still, Callicott argues, even if ‘wilderness’ could function objectively, wilderness preservation would not be a proper goal of environmentalism. For nonhuman nature, biodiversity protection and ecosystem health are the proper desiderata, and these can both be *enhanced* human manipulation and inhabitation of wild places. In our own lives, sustainable development is the proper environmental goal.

Callicott is correct to advocate sustainable development. But defined to include preservation of biodiversity, as it should be, sustainable development is a complement, not an alternative, to wilderness preservation.¹⁰ Limiting pollution and reining in unsustainable levels of resource use would both protect future generations’ welfare and lighten our effects on natural biological communities. Furthermore, consuming less, polluting less, and setting aside wild areas are all necessary to protect biodiversity.

Callicott is also correct that biodiversity preservation sometimes demands intrusive management in wilderness areas. Extirpated species may be reintroduced. Unruly natural processes like fire and flood, which we are unwilling or unable to allow to function on their own, may be selectively instituted to restart succession, create new habitats, release nutrients, or cleanse natural systems. Objective conceptions of ecosystem health and integrity can sometimes allow us to specify such positive interventions.

But Callicott overstates the case for such intrusiveness, as in his discussion of an example of adjacent oases in the Sonoran Desert, along the

U.S./Mexican border (243). Both were the sites of centuries of small-scale cultivation by Papago Indians. In the 1950s, A'a I Waipia, the oasis north of the border, became part of Organ Pipe National Monument, and cultivation was halted, while Ki:towak, south of the border, continued to be utilized for small-scale farming. Callicott cites Gary Nabhan's (1982) study which showed a greater number of bird species around the cultivated oasis and fewer at the oasis within the protected area. He concurs with Ehrenfeld that "the presence of people may enhance the species richness of an area rather than exert the effect that is more familiar to us." "Undoubtedly," Callicott continues in his own voice, "the desert ecosystem has been enriched rather than impoverished by millennia of Papago habitation and exploitation." This is just one example that "the past affords paradigms aplenty of an active, transformative, managerial relationship of people to nature in which both the human and nonhuman parties to the relationship benefitted" (243).

Callicott's example is misleading, however. Rolston (1991) notes that species diversity of other animal taxa was less around Ki:towak than around A'a I Waipia, perhaps due to human hunting pressure or monopolization of key habitat (372–73). The increased species richness for birds was probably due to a greater number of common, weedy species.¹¹ The issue is whether the full complement of native species has been preserved, not absolute species numbers. Otherwise, we might enrich Sonoran biodiversity by introducing exotic toucans and bee-eaters.

Native birds which are present at Ki:towak but absent at A'a I Waipia should have natural habitats elsewhere in the area, perhaps living there in reduced numbers: these species are not human creations, after all. If Sonoran riparian habitats have been largely appropriated for human use, we should work to restore some of them for wildlife—not congratulate ourselves on the wild remnants clinging to our own oases. Of course, artificially boosting water levels, key nutrients, or other limiting resources at a particular site might be necessary to help the last population of an endangered species whose habitat has been largely appropriated by humans. This hardly seems a ringing endorsement for human management, however, especially since the survival of such a species is unlikely.

Ki:towak lands, lacking reserve protection, are under intense development pressure, which has begun to degrade the land's usefulness for biodiversity protection (Rolston 1991, 272). Callicott (1994) responds that this does not harm his case, which is that some human use is compat-

ible with protecting biodiversity, not all human use. He argues, correctly, that we need to develop modes of resource production which are less destructive of biodiversity, because much land will continue to be used for crop, cattle, and timber production, and some biodiversity may be saved by better management practices on such lands. But Callicott fails to acknowledge the obvious fact that where human beings mold the earth to fulfill our purposes, this tends to overwhelm the interests of nonhuman nature.

Four points must be emphasized. First, even to make sense of the empirical issues here—To what extent are we preserving biodiversity in managed and unmanaged areas? To what extent is statutory wilderness necessary to preserve biodiversity?—we must keep the notions of species in their proper places, places holding their natural complements of species, processes that would take place in the absence of humans, and species living their natural-historical lives and preserving their independent germ lines. Without these blurry but usable distinctions, biodiversity collapses into mere numbers of species and processes that we want to preserve, for our own purposes.

Second, wild areas are necessary to keep wild species wild. A wilderness preserve safeguards organisms from human economic impacts and allows them to continue to live in the ecological relations that sustain them, and to slowly evolve into something different, yet not of human design. The importance of such independence should not be overlooked: to do so is to assume a reductionist view which defines species solely in terms of their genes and not also in terms of their evolutionary histories and ecological interactions. We change species when we take control of their evolution; eventually that will be seen in genome, behavior, physical appearance, and all the ways that seem more objective than whether or not we are managing them. But the latter is every bit as much as objective fact.

Third, heroic measures and intrusive management often fail to preserve species, while we know that historically, wilderness has created and preserved them. So even if we define biodiversity reductionistically and assign no independent value to the absence of human interference, if we value biodiversity, then the case for setting aside wilderness areas is unshakable.

Fourth, *wilderness is itself a part of biodiversity* and not just a means to preserve it. Conservation biologists standardly define biodiversity to include species diversity, genetic diversity, and community diversity; the

latter defined in an introductory text as “different biological communities and their associations with the physical environment (‘the ecosystem’)” (Primack 1998, 23). But if biodiversity includes biological communities and ecosystems, their disappearance or “development” into something essentially different constitutes a loss of biodiversity. Wilderness areas as largely unmodified ecosystems and wildness as a quality species or individual organisms may possess of having a history and existence independent of the human race are—stripped of their subjective and evaluative overtones—important objective characteristics of biodiversity.¹²

Callicott’s hopes that humans may “enrich biodiversity” are illusory.¹³ Like Cronon, he has allowed his desire to exist harmoniously with the rest of nature to sway his judgment concerning what is best for it. What our human “pueblos” may truly add to the landscape are two things. First, new urban and agricultural areas. Though invariably simplified and less diverse in native species than wild areas, these do add something new to the landscape of human, cultural value. Such humanized landscapes are necessary; they can be interesting and even beautiful. But they should not become so numerous as to drive species or rare biological communities to extinction.

Second, pueblos add people who can understand and appreciate nature. This is what humans can add to wild places: understanding without domination. *Pace* Callicott, it is more important than a few field edges for birds—or bird watchers. Rolston (1994), among others, has developed this theme, finding value in the grand story of evolution and locating a unique human value in our role as Nature’s storytellers.

A large part of the beauty of Indian pueblos is their setting: scattered human settlements in a larger wilderness. The wooing of the Earth, yes, and modest urban centers with their human, cultural values, but set in a larger, transhuman world, with plenty of room for wild nature to carry on its varied works. Papago Indians hundreds of years ago did not have the means to dam huge rivers and irrigate large stretches of the desert, or to rip up the earth for oil and uranium. They could only directly and significantly affect a small portion of their known landscape and thus never had to consider the question of how much of an accessible, valuable landscape to leave untrammelled. For us, this is all reversed. The question of restraint has become very important—if, that is, we take the time to learn about the rest of nature and decide that it has some value which we must respect.¹⁴

CONCLUSION

This does not mean that we will not have to make hard choices to protect biodiversity; for instance, more intensive management to safely reintroduce natural processes like fire, or animals like grizzly bears and Bengal tigers, which might endanger human life or property.¹⁵ Wilderness in the sense of nonmanaged nature will have to give way, in many places and many ways, to managing for the survival of particular species and biological communities. But let's not feel too good about it. Or if we do feel good, let's feel good about helping nature be itself, based on our best understanding of what unmanaged nature would be.

For example, Primack (1998) suggests that under current models of global climate change, "more than 10% of the plant species in many U.S. states will not be able to survive the new climatic conditions—they must migrate northward or die" (243). He argues that "if species are in danger of going extinct in the wild because of global climate change, the last remaining individuals may have to be raised in captivity; hopefully, wild populations of these species can then be reestablished in new protected areas where the climate is suitable for them" (246). In these cases of ecological triage, then, we should move from a wild species—not our creation, not domesticated—to a wild species, living and continuing to evolve in the wild. The goal should be a future in which other species survive without having to be moved, monitored, or supported by us. By managing ourselves more wisely, we can limit the need to manage wild nature.

With this I return to my original point: respect for nonhuman nature and an understanding of the threats facing it strongly support wilderness preservation. To be successful this must include continued expansion of wilderness preserves, management and nonmanagement for wildness, and limits to human consumption, mammonism, and numbers. Only thus can we end the sixth great extinction spasm in the 3.5 billion-year history of life on Earth; the first, if we continue on our current path, to be freely and consciously enacted by self-proclaimed *Homo sapiens sapiens*.

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NOTES

1. In current terms, some nonhuman beings have intrinsic value. Many philosophers balk at this term, preferring inherent value, rights, or moral considerability. I believe that in the end these all come to the same thing. For example, some hesitate to assign rights to Giant Sequoias, but believe they possess intrinsic value. This is either a reaction to the linguistic awkwardness of using the word 'rights' in connection with trees, or an assertion that human beings make a greater moral claim on us than trees. The former, linguistic points begs all the important questions. It sounds funny to speak of trees' rights, because we are used to treating trees as mere things; it sound less funny to speak of trees possessing intrinsic value, because this is a term of philosophical art. The latter, substantive position, that human beings have rights while trees have intrinsic value, can be expressed with no loss of content by saying that humans and trees both have rights, but that their rights differ; or, that humans and trees are both morally considerable, but that humans are more important than trees and should be treated accordingly.
2. "Order existed," "largely unmodified," and "essentially unmanaged" are somewhat vague. But they could be made more precise, and, once again, used to make true or false statements.
3. Cronon's article appears both in Cronon (1996) and as the centerpiece of the inaugural issue of *Environmental History*, with responses from Samuel Hays, Michael Cohen, and Thomas Dunlap, and an author's rebuttal (Rothman 1996). The journal *Wild Earth* also devoted much of one issue to a discussion of Cronon's article (Davis 1996). See Callicott and Nelson (1998) for further discussion.
4. For example, we can imagine a forest in which many organisms are descendants of genetically engineered species, which colonized the forest after escaping from a biotechnology firm's laboratories. In this case, the land itself might not have been tampered with directly, but some of its elements have been. In contrast, there are forests whose components are not the product of such engineering, but where the trees are planted in orderly rows and heavily sprayed with fertilizers and pesticides. This forest is artificial in a different way. Again, we have Chris Maser's (1988) ideal, where natural forces are mimicked successfully and yet these processes are highly controlled. This brings in another sort of artificiality. Finally, there is a sense in which even the forests of our most

remote, unmanaged wilderness areas are enclosed within artificial boundaries; this change, from de facto wilderness to wild only at the mercy of human beings, is important. None of this, however, argues away the distinction between wild and managed forests.

5. There are two main problems with this position: the problem of whether nonconscious entities exhibit genuine autonomy and the problem of whether autonomy is the key to moral considerability that Kant and so many other western moralists have taken it to be.
6. For example, over the past fifty years, ecologists have discovered the important and varied roles fire plays in natural succession in forests throughout the United States. At the same time, anthropologists and historians have documented important aboriginal fire use to manage the landscape for hunting, farming, and warfare. We cannot tell the actual story of what happened on the North American continent since Indians' ancestors crossed the Bering land bridge without asking to what extent Indian fire use mimicked natural fire regimes and to what extent it changed them. We cannot understand further changes in the land without studying how white settlers' fire management differed from the Indians' and how current land managers' differs from early white settlers, and neither of these questions can be answered without, once again, some understanding of natural fire regimes.
7. The phrase "significantly alter" is ambiguous but unavoidable. Respect means allowing a thing to be what it is and valuing it for what it is. Thus human beings, as human beings, should command our respect. We are not free to make them whatever we want; perfect slaves, for example. What is a significant alteration of wilderness? Our answer should not refer to our attitudes, but to our concrete effects on wild places. Following recent definitions of ecosystem integrity, we might define significant alterations as those which change a wilderness area's species composition or basic ecosystem functions (Westra and Lemons 1995). Still, management which preserves these, yet involves intense human manipulation, is itself a significant alteration: bringing conscious, purposive action into the system involves something radically new and essentially different.

In arguing against such radical alteration, the wilderness defender finds himself in the same position as the defender of human liberty, who values liberty not just for its fruits but as a good in itself. Both will find it difficult to justify such basic or ultimate values, both will give ground when freedom or wilderness conflict with other important values, and both will continue their advocacy in the face of uncertainty and complexity.

8. Callicott (1991a) is part of an exchange in *The Environmental Professional*, which includes Rolston (1991) and Callicott (1991b). Callicott further develops and defends his views in an exchange with Dave Foreman and Reed Noss in the journal *Wild Earth* (Davis 1995). The debate continues in Callicott and Nelson (1998).

9. Regarding this last distinction, an English critic doubts that we can know which species a place would have supported absent human invention. The obstacles may be formidable, I agree—especially in long-settled, overpopulated countries such as the United Kingdom. Still, historical and ecological study can tell us much in such cases. If similar areas have been preserved free from intense human management, we can better estimate past species compositions in developed areas. By preserving wilderness, we preserve both knowledge of an independent nature and the ability to imagine such a nature.
10. Unless wild nature is explicitly recognized as part of what we are trying to “sustain,” we may create a world which is comfortable and healthy for humans, but largely depauperate of other life forms. For example, the United Nations’ Brundtland Commission defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Norton 1992, 98). On this interpretation, massive biodiversity loss is sustainable, provided future generations can meet their self-defined needs. Compare Barbier’s more generous definition of sustainable development: “to *maximise simultaneously* the biological system goals (genetic diversity, resilience, biological productivity), economic system goals (satisfaction of basic needs, enhancement of equity, increasing useful goods and services), and social system goals (cultural diversity, institutional sustainability, social justice, participation)” (Munda 1997, 215).
11. Typically, bird species are different in managed and unmanaged areas. For example, see Schulz’s and Leininger’s (1984) study of grazed and ungrazed riparian areas in Wyoming.
12. Oddly enough, some conservation biologists resist this conclusion. This is partly due to a reductionist conception of biological species, partly due to a desire to preserve the option of managing wild areas, when this is necessary to save wild species. The latter consideration is an important one, but it seems better to recognize wilderness management as an often necessary evil in our crowded, anthropocentric world.
13. More accurately, the illusion comes in thinking that human interference within wilderness will enrich biodiversity. People have arguably enriched biodiversity by creating new breeds of dogs, cats, sheep, and pigs, and new varieties of corn, beans, roses, and violets. One could also say that cornfields, tree farms, and even high-rise office buildings represent increased biological diversity; after all, they are new ecosystems with characteristic species compositions and energy and materials pathways. But of course these new ecosystems displace other ones. Most definitions of biodiversity tacitly leave out such human creations. Far from showing any metaphysical confusion, this position rests on the modest moral principle that increased creativity among *Homo sapiens* does not balance out destruction of the creation of *Deus sive Natura*.
14. What of the many countries which have eradicated wilderness completely? Their citizens still need the concept in order to understand their own history,

for all the earth was once a wilderness. And they still need the notions of wilderness and wildness, if they have an interest in preserving and restoring their native flora and fauna. For example, the Dutch are engaged in several ambitious wetland restoration projects. The return to a closer approximation of historical hydrological regimes and natural communities might require continuous management in perpetuity. Still, such management rests on an understanding of the wild conditions that it seeks to approximate (see Noss and Cooperrider 1994; Rolston 1994).

15. There will also remain hard cases involving conflicting human and nonhuman interests. See Ramachandra Guha (1989) for an argument that wilderness preservation is inappropriate and unnecessary in poorer countries, whose peoples face more pressing environmental issues centered on meeting basic human needs. In effect, Guha denies the intrinsic value of nonhuman nature and dismisses as unimportant the loss of biodiversity in the Third World. For a rebuttal see Cafaro and Verma (1998). The late, lamented journal *Terra Nova* recently devoted an entire issue to Third World wilderness (Rothenberg 1998).