

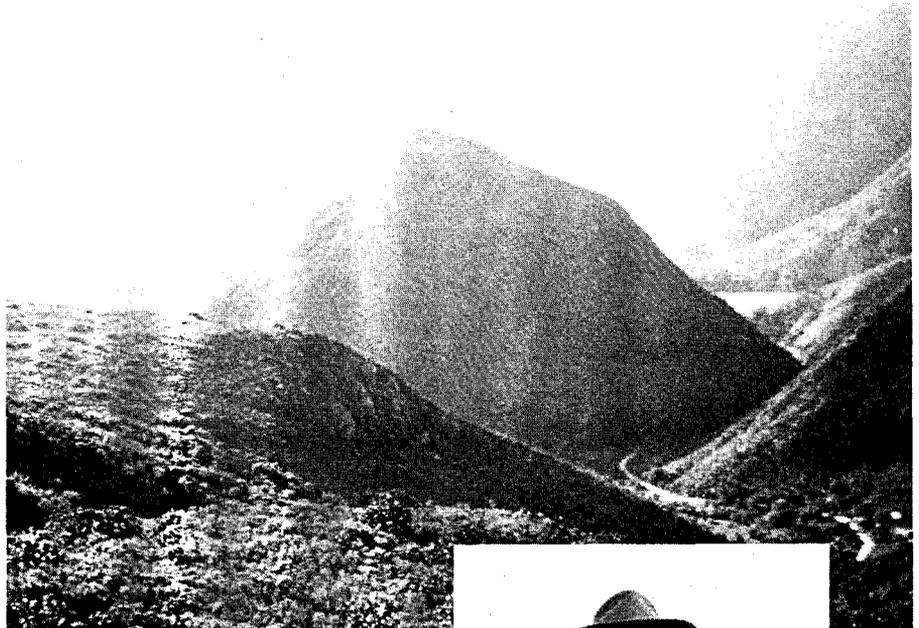
Soul of the Wilderness

Biodiversity, Ecological Integrity, and Wilderness

BY REED F. NOSS

A FEW YEARS AGO I SPOKE AT A WILDERNESS MANAGEMENT SYMPOSIUM about the relationship between wilderness protection and the conservation of biodiversity. The major theme of the meeting was the nonrecreational values of wilderness, but I was the only one who talked much about biological values and how wilderness provides vital habitat for species that are sensitive to human activities. I also introduced the relatively arcane idea that true wilderness provides for "higher-level" aspects of biodiversity, namely the landscape-scale processes and shifting-habitat mosaics that can be expressed only in wild areas many thousands or millions of acres in size—areas where natural disturbance regimes overrule the actions of humans. I acknowledged that most designated wilderness areas, like other conventional parks and reserves, are too small to encompass these patterns and processes. But I argued that small wilderness areas (approximately 10,000 acres/25,000 ha) aren't real wilderness. You can't even get lost in them.

If asked to speak on the same topic today, I would present a similar message. But I'm less confident now that the wilderness preservation and biodiversity conservation movements are converging. Over the last few years I have been forced to rethink some of my assumptions; for example, that large, wild areas are essential components of a conservation strategy, and that wilderness and biodiversity are compatible objectives. I had taken it for granted that these things are true, but increasingly I have encountered skeptics who argue that the battle for biodiversity will be won or lost in the human-dominated landscape—the "matrix"—and that wilderness areas are merely cultural artifacts, trivial remnants of a romanticized past to which we can never hope to return. I am amazed at how few defenders of wilderness there are among the modern conservation crowd. Scientists in particular are uncomfortable with the wilderness idea because it seems so subjective, soft, and nonquantifiable. Biodiversity they sincerely embrace, but these same scientists would just as soon leave wilderness to the backpackers, poets, and tree-huggers. So I have rethought my position. My conclusion, for the time being at least, is that large, wild areas—whether or not we call them wilderness—remain among the most important components of a conservation network. I believe



Verdant forested sand dunes of Lake St. Lucia, South Africa [above]. Article author Reed F. Noss (right).



more strongly than ever that wilderness, and natural areas in general, should be evaluated primarily in terms of their contribution to the broad goals of protecting and restoring native biodiversity and ecological integrity to

our planet. However, I am less optimistic than I once was on whether scientists, activists, recreationists, managers, and the broader public can ever agree on how biodiversity and wilderness concerns should be reconciled. And I am more adamant about the need for active management, at least of a restorative nature, for wilderness areas too small to manage themselves.

We Need **to** Save Large Areas

In some ways biodiversity and wilderness (or more generally, wildness) are perfectly compatible. First, both biodiversity and wilderness values are best fulfilled in large areas. From the wilderness point of view, large areas are, all else being



Rare, lowland coastal rainforest, North Queensland, Australia (left). (Photo by Vance Martin.) Rainforest harvest, Queensland, Australia (above). (Photo by Vance Martin.) High mountains contain the least biodiversity (far right). (Photo by Tom MacDonald.)

equal, simply wilder. They are more awe inspiring. But “bigger is better” is also the most fundamental, best documented principle of conservation biology. Although biologists have long argued over whether one large reserve is superior to several smaller reserves of equivalent total area (and have generally agreed that the question is a red

generally by keeping road density low across large landscapes, and contribute to the conservation of these species. Across the world, areas where human activities are excluded or highly restricted have proven to be valuable havens for wildlife. For example, the Korean Demilitarized Zone is the major stronghold for wintering and migrant white-naped and

natural conditions and how human activities affect these processes. We are doing a lot more conscious experimentation in land management today than in Leopold’s time. This is all well and good, but because our ecosystem management experiments span entire landscapes, there is a greater need than ever for control areas that also span entire landscapes. These control areas, or benchmarks of normality, must be big wilderness. Paradoxically, most of these control areas will themselves require

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some kinds of management—restoration, maintenance, and protection—to ensure that they effectively

herring), few doubt for a moment that individual reserves and the total area in reserve networks should be as large as possible. Large areas hold more species, contain larger and more viable populations of species that are area-sensitive, are easier to manage (per unit area, anyway), and are less affected by nasty human influences (ATVs, poachers, feral cats, nonnative weeds, etc.) coming across their boundaries. The animals most closely associated with wilderness—large, mammalian predators—are among the species of greatest concern to conservation biologists, because they are extremely sensitive to human harassment, occur in low densities, and have shown dramatic declines in most regions. By establishing large, interconnected wilderness areas, or more

red-crowned cranes, among other imperiled species. Just look at any map showing the pre-European settlement and present distributions of grizzly bears, wolves, pumas, and other large carnivores in North America; the only places these species remain are the wildest and least accessible.

A second way in which wilderness and biodiversity are compatible has to do with benchmarks. As Aldo Leopold pointed out in 1941, wilderness provides a “base-datum of normality” for a “science of land health.” Despite the arrogant claims of many proponents of ecosystem management, we know little more today than in Leopold’s time about how to manage the land in a fully sustainable way. However, thanks to ecologists we have learned a bit more about how ecosystems function under

represent natural systems. For example, prescribed burning often will be necessary to maintain fire-dependent vegetation in areas where fires have been suppressed and that are too small to receive frequent lightning strikes.

There are other ways in which biodiversity and wilderness are compatible and mutually reinforcing, but we must also acknowledge ways in which they are not. Particularly in the temperate zone, the landscapes richest in biodiversity (in terms of species richness, for example) already have been either converted to agriculture or other intensive human uses, or have been degraded due to alteration of natural disturbance or hydrological regimes, road-building, invasion of exotic species, and other insults. We might be able to establish restoration projects or

biodiversity management areas in such landscapes, but these areas will hardly meet the conventional criteria of wilderness. In the Pacific Northwest region of the United States, designated wilderness areas contain fewer northern spotted owls than managed forests for a simple reason: Most wilderness areas are at high elevations beyond the distribution of the owl. Larry Harris's landmark book, *The Fragmented Forest*, contains a graph showing a dramatic decline in the number of species of amphibians, reptiles, and mammals as elevation increases in western Oregon; wilderness areas generally contain the fewest species, private lands the most, and multiple-use lands lie in-between. Moreover, many of our most imperiled species—endemic plants, invertebrates, and small vertebrates—do not require wilderness but could persist quite well in relatively small, isolated reserves if these areas were properly buffered and well managed.

Traditional Conservation Versus Conservation Biology

Many traditional conservationists are uncomfortable with the increasing influence of conservation biology in the environmental movement and, occasionally, in land protection decisions. Speaking at the 1995 North American regional meeting of the World Conservation Union Commission on National Parks and Protected Areas, Michael McCloskey, chairman of the Sierra Club, expressed concern that “the preservation of biodiversity is put forth as the *raison d'être* for protected areas” and that “every other reason for having them is treated as secondary, if not trivial and old-fashioned.” McCloskey noted that the diversity of reasons for having protected areas has expanded the constituency for them. He then chastised me and other conservation biologists for heaping disdain on protected areas, because they are not in the right places or are too small, too far apart, or not managed or buffered well. McCloskey's central point is that criticizing our protected-areas system

is counterproductive because “it will be all too easy for the public to conclude that such systems should be dismantled if this is the message they get from leaders in the environmental community.” Within The Wildlands Project, a coalition of scientists and activists interested in restoring native biodiversity and wildness to every region of North America, it has proved difficult to reconcile the wild and the diverse. When its budget hit an all-time low, The Wildlands Project opted to maintain the portion of its program focused on wildness and activism and to gut the science program, just as many of the mainstream conservation groups (e.g., the National Audubon Society) have done and as the federal land-managing agencies routinely do (slash science budgets, that is). I found myself and the program I initiated without funding and resigned in January 1996 as The Wildlands Project's science director.

Wildness is just as meaningful to me as biodiversity. When it comes right down to it, the emotional and aesthetic reasons for protecting wild areas are more important to me than the scientific reasons. But are we not somewhat selfish in our love for wilderness, our craving to be alone in places that humble and excite us, that are beautiful, or that challenge us recreationally or spiritually? Does any other species feel this way about wilderness? Does any organism besides a few fanatic *Homo sapiens* need wilderness? Let's face it: Wildness is a more anthropocentric conservation criterion than biodiversity. I can think of no conservation goal less biased, more biocentric, more all-encompassing than protect-



ing and restoring native biodiversity and ecological integrity. Wilderness areas, designated and otherwise, contribute to this goal and are essential for some species, at least given the human attitudes and behaviors that currently make nonwilderness unsafe or unlivable for them. But wilderness is not the whole picture. Wildness, however exalted it makes us feel, is incomplete as a conservation objective. Unless wilderness contributes to the higher goals of biodiversity and ecological integrity, in these times of mass extinction and degradation of ecosystems on a global scale it is perhaps frivolous to spend much time trying to protect it. In many cases our efforts would be more fruitfully employed in ecological restoration, in trying to help heal the landscapes we have already damaged. A greater number of species would probably benefit.

So how can we make wilderness designation and management more re-

sponsive to the most pressing needs of the 21st century? First, we need to re-evaluate the criteria used to select conservation areas, including but not limited to wilderness, to make sure they are fully consistent with what modern ecology and conservation biology have to teach us. Wilderness areas and other reserves should be selected primarily to represent all kinds of ecosystems and species assemblages (the goal of the U.S. National Biological Service's Gap Analysis project), maintain viable populations of all native species in natural patterns of abundance and distribution, sustain ecological and evolutionary processes within normal ranges of variation, and be adaptable to a changing environment. These biocentric objectives must be primary if we are truly serious about averting the biodiversity crisis. But then, nearly as important, must come the objective of encouraging human activities that are compatible with the maintenance of ecologi-

cal integrity and discouraging those that are not. Within wilderness and other protected areas, some of the most compatible and necessary activities are scientific research, monitoring, and active restoration and management of native biodiversity. These activities have been nonexistent in many wilderness areas, which seem to be viewed more as public playgrounds. Hence, we have wilderness areas where overgrazing by livestock is severe, forests are unnaturally dense and unhealthy due to lack of fire, lakes are stocked with fish not native to them, and trails are eroding. Acknowledging that biodiversity and ecological integrity should be foremost objectives for wilderness designation and management-and that active management usually will be necessary in these areas-does not mean we destroy the wild. It does not mean we forget about all other values of wilderness and lose the constituencies we have gained. It certainly does not mean we

stop defending truly wild areas. It is only a matter of recognizing priorities. Spending time in wilderness continues to be my greatest inspiration, my motivation to keep up the good fight. But I suggest that what we fight for be extended from our own gratification to encompass, as far as we can determine, the needs of all other species. It is the least we can do for them. IJW

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