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## CHAPTER 11

## VALUING WILD NATURE

PHILIP CAFARO

PRESERVING wild nature has been an important goal of the conservation and environmental movements throughout their existence. This is illustrated by the creation of national parks and wildlife preserves in many parts of the world, by efforts to protect endangered species and even in modest attempts to keep a little wild nature on managed landscapes, such as butterfly gardens in city parks. The reasons given for preserving wild species and wild places sometimes focus on the benefits to human beings and sometimes on the intrinsic value of wild things themselves. In either case, more or less emphasis may be given to wildness per se as a direct value-conferring property. Instrumental and intrinsic value arguments are typically found together in the speeches and writings of conservationists. While philosophical analysis may separate them, both rhetorical effectiveness and the logic of ethical justification tend to bring them back together.

Though nature lovers have won many battles, overall we are losing the war to preserve wild nature. The twentieth century saw by far the greatest conversion of wild lands to developed lands of any time in history: a function of humanity quadrupling its population and expanding the global economy twenty-five-fold (Reid et al., 2005). This great taming was attended by the extinction of many thousands of species of wild animals and plants, a reduction in numbers and range for most remaining species, and the extension of human impacts across every square meter of the Earth's surface. While much wildness remains, humanity continues to degrade and displace wild nature and the prognosis is for its continued degradation and displacement. Little wild nature will remain a century or two from now unless humanity consciously and forcefully commits to limiting our domination of the biosphere.

For those who place a high value on wild nature, creating societies that preserve wildness on the landscape remains a key ineliminable component of a proper environmentalism. Environmentalists of a more anthropocentric bent may see preserving wild nature as at best a distraction from more pressing issues, such as reining in pollution threatening human health. Clarifying the value of wildness thus is a key task facing environmental ethics. Because human demographic and economic growth necessarily displaces wild nature, whether we value the wild will help determine whether environmentalists continue to accept conventional measures of social progress focused on growth, or replace such goals with others that are less harmful to other forms of life. Whether we value wildness per se also has important implications for a whole range of particular environmental policy decisions from forest management to geoengineering to population policies.

## 1 WILDNESS DEFINED

The *Oxford English Dictionary* defines the adjective "wild," in part, thus:

1. Of an animal: Living in a state of nature; not tame, not domesticated . . .
2. Of a plant (or flower): Growing in a state of nature; not cultivated . . .
4. a. Of a place or region: Uncultivated or uninhabited; hence, waste, desert, desolate . . .

Antonyms such as "tamed," "domesticated," "cultivated," "inhabited," or "developed" refer to various ways in which nature can be dominated or displaced by people: the independent activities of organisms are replaced by the goals of their human masters (horses pull plows); the spontaneous productions of a piece of land are replaced by landscapes that people find more useful (fens are drained and grow corn). At its core, "wildness" means biological nature's freedom from domination by human beings. Men and women can be free; birds and beasts, swamps and forests, can be wild.

Like human freedom, biological nature's wildness is relative rather than absolute. Sometimes it makes sense to sharply distinguish the wild from the tame. Dogs and chickens are domestic animals, we say, while wolves and golden eagles are wild, thus marking what we take to be a fundamental difference between these animals. Wolves and eagles are best understood in terms of their evolutionary histories and ecological relationships, stories in which humans play little to no role, while dogs and chickens have largely evolved through interactions and manipulations by people.

At other times it makes more sense to speak of wildness as a matter of degree. For example, there may be numerous stages on the way from a natural forest to a tree plantation, or from a wild and free flowing river to one that is heavily managed or impacted by humans. We can jump many stages at a time—tropical primary forest is cut down and planted to sugar cane or oil palm trees—or the pendulum can swing slightly in one direction, as human impacts or control increase or decrease. Here understanding and explaining the details of what one sees on the landscape is likely to be furthered by a view of wildness as graded and multivalent and by sensitivity to both human and non-human influences on the land.

Critics sometimes claim that wildness and the related concepts of nature and the natural are incoherent or systematically misleading (Nelson and Callicott, 2008), and it is certainly true that the words "wild," "nature," and "natural" have multiple, complex objective meanings and subjective overtones that can lead to obscurities in their use. John Stuart Mill noted long ago two principal meanings for the word "nature": (1) that which is distinct from the supernatural, the physical world as a whole; and (2) that which "takes place without the agency, or without the voluntary and intentional agency, of man" (Mill, 1874). To this day critics of wilderness preservation efforts sometimes object that human actions are "just as natural" as beavers building dams, so that there is no point in designating wilderness areas. But this seems willful obscurantism: a deliberate confusion of Mill's senses 1 and 2. In fact, the multiple meanings of "wild" and related terms can help people express their insights into nature. When Henry Thoreau (1906) writes in his journal for February 16, 1859 that "what we call wildness is a civilization other than our own" he is making the case that wild lands in the sense of lands "uncultivated or uninhabited" by people are *not* wild in several further

senses: not "waste" places because other species make use of them and in fact need them for their survival (a moral point); not "lawless" or "disorderly" since they have their own ecological regularities, which we can study and understand (a scientific point). The wildness of our words, their protean and open-ended nature, helps generate their power and usefulness (Wittgenstein, 1973).

In an influential discussion John O'Neill, Alan Holland, and Andrew Light (2008, chapter 8) review some subtleties around the use of the term "natural," plausibly claiming that its descriptive use sometimes obscures more than it reveals about the genesis or character of specific places. Because they are particularly interested in mixed landscapes whose features owe a lot to both human and non-human causes, O'Neill et al. see a simplistic wild/humanized dichotomy as misleading. Doubting whether more rigorous or nuanced use of such concepts might help us understand the past or plan for the future in such areas, O'Neill et al. question whether "there is a significant distinction to be drawn between what humans do intentionally and everything else that happens." "To picture nature as the world from which intentional human acts have been abstracted may seem unreal," they write, "given that intentional human agents are as much products of nature [in Mill's sense 1] as are sunflowers and seahorses" (2008: 130–131).

But sunflowers and seahorses are not poised to extinguish a significant portion of the world's species in the next hundred years. Human beings are. Even were this not the case, the evolution of complex consciousness and intentionality arguably rank among the half dozen major achievements of life's three and a half to four billion year career on Earth. The widespread substitution of conscious human goals for nature's unconscious teleologies, along with the immense power, influence, and moral responsibility that flow from this substitution, mark important and essential changes in the world. Like the rise of multi-cellular organisms, the rise of complex consciousness does indeed mark a "significant distinction" in evolutionary history. Like the asteroid that probably caused Earth's last mass extinction, we deserve "significant distinction" for our role in altering life's trajectory. Whatever the metaphysical status of complex consciousness and intentionality, their ontological and ethical importance cannot be denied.

In the end it is only a concept's proven usefulness that can justify our continuing to use it. Wildness remains a useful concept ethically. It helps people create laws and institutions that let them treat the natural world with respect and restraint, such as national parks and "wild and scenic river" designations (Wuerthner et al., 2015). The concept also remains scientifically useful, helping paleontologists and ecologists consider the relative importance of anthropogenic forces in determining the phenomena they study. To note three relevant examples, there exist robust ongoing debates about the roles native peoples have played in determining the species composition of lands in the Brazilian Amazon, influencing fire regimes in different ecosystems in North America, and causing species extinctions in Australia. These debates could hardly take place without distinguishing between natural and human influences. And when we consider the broad sweep of world environmental history over the past hundred thousand years, the story that confronts us is the rise of humanity, and in the past few hundred years our rise to dominance over the rest of life. One can no more ignore or downplay this story line than one could accurately tell Life's story during the Mesozoic Era without mentioning the dinosaurs (or describe that era's end without the asteroid).

When we move from describing the past to prescribing actions for the future, however, "to picture nature as the world from which intentional human acts have been abstracted



may seem unreal" for reasons that are less conceptual than empirical. For some critics argue that wildness is a quality that, perhaps sadly, has vanished from the landscape and for that reason has little applicability to today's environmental choices (Kareiva and Marvier, 2012). Whatever the past merits of preserving wild lands or keeping a "hands off" policy regarding other species, these positions no longer make sense. No area is really wild, so we cannot preserve areas *as* wild. Furthermore, keeping (formerly?) wild plants and animals on the landscape now often involves active management to preserve the conditions that allow them to continue to thrive. The Anthropocene Epoch is here, these critics say. Get used to it.

Any defender of wild nature must grant that there is some truth in these criticisms, since they are grounded in the very trends that we decry. I believe the proper response to them must begin by acknowledging that in some places and for some kinds of decisions the critics are correct. If a wetland providing important habitat for migrating waterfowl depends on water piped in from a reservoir, nature lovers probably should not try to make the area more natural by removing the pipe and drying out the wetlands. If native prairie plants on publicly owned lands depend on grazing and native grazers have been removed, we may sometimes support managed cattle grazing as an ecological substitute. Wild values often conflict with one another and with other important values in the crowded, damaged world humanity has created. Upholding them often involves compromise and accepting partial success.

However in many areas and for many decisions it still makes sense to try to keep nature as wild as possible, by avoiding increased human influence or actively working to decrease human impacts or control. Arguably the US National Park Service should stop culling elk in Rocky Mountain National Park and instead reintroduce wolves, thus recreating more natural conditions in a park whose stated management goals prioritize the preservation of natural processes and ecosystems. Arguably we should allow most wild fires to burn in remote areas of the US Rocky Mountains, not just because excessive control efforts are expensive and often futile, but also because fire is a natural process that belongs in these wild ecosystems and because it rejuvenates ecological conditions that benefit many native species. Whether such a *laissez-faire* approach to fire in the Rockies will remain the right choice one hundred years from now under a human-altered climate is a further question.

This example suggests that it also makes sense to talk about preventing *the world as a whole* from becoming more dominated by humans (Wuerthner et al., 2014). Climate change indicates an ever more pervasive human impact on the Earth, but this should not lead to complacency regarding our intrusiveness. Rather than take climate change or other massive ecological harms as justification for discarding the preservation of wild nature as an important conservation goal, we may take them as evidence that people are too intrusive now and that we should strive to reduce our impacts. It is not just that serious harms are likely to befall both people and other species due to climate change (although that appears to be true). It is that it is greedy, creepy, sloppy, and wrong for humanity to degrade the biosphere in this way. It would be even more presumptuous to compound the wrong by trying to take conscious control of Earth's atmosphere and climate. Instead we should work on controlling ourselves.

What we are asking of people when we set aside wilderness areas, limit pollution, request that folks not feed the bears, or in other ways seek to protect wild nature is that they act with respect toward these radically other beings and places, appreciate them for what they are, and let them be. There is no jettisoning the concept of the wild or the effort to preserve some nature relatively free from human interference without accepting the human conquest of the

biosphere (Cafaro, 2013). And we should not accept that conquest because it is selfish and unjust: the hogging of the world's resources by one species at the expense of all the others. Better to step back from the moral abysses of mass extinction or the attempt to geoengineer Earth, show some humility and set limits to human domination. For skeptical readers who still wonder *why* it would be better to allow the world to remain partly wild, I specify an answer in what follows: first in terms of the instrumental and intrinsic values of wild nature, then in terms of the narratives that conscientious human beings would want to tell about their own lives and about humanity's career on Earth in the coming centuries.

## 2 INSTRUMENTAL VALUE

Looking again at the *Oxford English Dictionary*, I'm struck by the many negative connotations the word "wild" may carry, such as rude, licentious, demented, or out of control when applied to a person and wasted, unimproved, dangerous, or worthless when applied to a piece of land. Yet people in fact find wild nature instrumentally valuable in many ways (Rolston, 1989, chapters five and seven). Consider the benefits that nearby residents might enjoy from a publicly owned second- or third-growth forest on the outskirts of a suburban town in the eastern United States: "wildish" if not fully wild, about two hundred acres in extent with clearings, ponds, marshes, and a few abandoned farm buildings. To visitors it may be

- A place of beauty when the spring warblers migrate through, the fall leaves change color, or during a thousand other ordinary or extraordinary occurrences throughout the year
- A place of recreation through which they walk, jog, bicycle, cross-country ski, fish, bird-watch, or aimlessly wander
- A place of learning for elementary school children catching crawdads or college students seining pond water for a microbiology class
- A place of refuge from crowds, asphalt, noise, or other tiresome aspects of more developed landscapes
- A place to watch wildlife of all kinds, including species that may be rare or non-existent elsewhere
- A place to think about local history among the ruined buildings and stone walls piled up centuries earlier by hardworking farmers
- A place for quiet reflection in which to meditate or commune with God or the local spirits

Finding instrumental value in wild landscapes in these ways need not involve denying the instrumental value of more developed landscapes. Walkers routinely find beauty in wild forests and well-designed gardens; students observe natural processes in the wild and test hypotheses back in the lab. However, some people may obtain some instrumental benefits more easily in wilder landscapes. Even if most folks are happy to commune with God inside a church, others head to the desert for spiritual reflection. Certain experiences and certain kinds of values may be better preserved in general on wild landscapes. Many field biologists and ecologists prefer studying relatively unmodified ecosystems that better model the



natural ecological interactions and evolutionary processes they seek to understand. We can experience the "otherness" of animals while playing with our cats and dogs but glimpse a more radical otherness in our fleeting sightings of wild animals. Too, there is often a greater amount or diversity of some valued quality when both wild and tame landscapes are preserved. We might live in the most beautiful town in the world yet still think that having a wild forest nearby adds important opportunities for appreciating beauty. We might still want that forest there, rather than another beautiful town.

The wild often has an important contrast value for people (Kahn and Hasbach, 2013). If you had to choose between having access to a garden and a wild forest, you might choose the garden as a more reliable source of food; in a more developed state of affairs with a grocery store down the street, you might choose the garden because you really enjoy gardening. Still, if we can have access to both, the forest provides experiences and values that enrich our existence. Aldo Leopold (1949) writes that wilderness as the cradle of human cultures "gives definition and meaning to the human enterprise," seeing in this an important cultural value best experienced directly. Holmes Rolston (1989) discovers a "dramatic contact with ultimacies" in wild lands and, like many naturalists, finds that encounters with wild creatures "stretch us out of ourselves." There is no way to put a dollar value on such experiences, but we sense that our lives would be impoverished without them. As societies become more technologically sophisticated, as crowds grow and natural landscapes shrink, these wild contrast values seem bound to increase in importance.

Instrumental values can motivate significant efforts to preserve wild nature. When fishermen oppose stocking rivers with dull, easy-to-catch exotic fish or birdwatchers purchase habitat for an endangered species that they someday hope to see, the native fish and birds are protected even if this protection comes through a selfish interest in preserving certain kinds of human experiences. Note though that many of our instrumental uses of nature point beyond themselves to an intrinsic value in wild things. It would be odd to go out to appreciate a forest's beauty and not find any value in it beyond its ability to show us beauty; odd to value ornithology as a noble pursuit if the stories that it taught about the lives and evolutionary histories of birds were themselves meaningless. Most people believe that at least some nonhuman beings or wild places have an intrinsic value beyond their instrumental usefulness to people.

### 3 INTRINSIC VALUE

Some of the most important arguments for the intrinsic value of wild nature have been explored in earlier chapters of this handbook. Important qualities that philosophers have appealed to in order to justify the intrinsic value of nonhuman organisms, species, or ecosystems include selfhood, sentience, conation, possession of a telos, order, complexity, creativity, diversity, uniqueness, and an ancient evolutionary genealogy. Wildness—the quality of being relatively free from human influence—can be an important value-adding quality in its own right, but it often figures in arguments for nature's intrinsic value in conjunction with some of these other qualities. Even when there is no explicit appeal to the value of wildness, it often seems to play a role in ascriptions of intrinsic value or moral considerability to wild nature.

Bernard Williams, for example, in answering the question "Must a concern for the environment be centered on human beings?" argues that in addition to straightforward worries about the fair allocation of resources among people, environmentalism is rightly based on appreciation and respect for "raw nature" itself (1995: 237). Whether manifesting as gratitude for nature's beauty or fear of its danger or indifference, these feelings point to "a value which we have good reason, in terms of our sense of what is worthwhile in human life, to preserve, and follow, to the extent that we can" (1995: 239). But it is precisely nature's otherness that grounds these feelings: the fact that it lies "outside the domestication of our relations with one another" (1995: 237). "Nature is independent of us, something not made, and not adequately controlled" (1995: 239). In this account nature's wildness is inseparable from the role Williams believes it may play in helping give definition and significance to people's lives.

Robert Elliot defends an intrinsic value in nature more directly. Arguments for nature's intrinsic value have appealed variously to "its beauty, diversity, richness, integrity, interconnectedness, variety, complexity, harmony, grandeur, intricacy and autonomy," he writes. "Doubtless these properties do provide bases for natural values. There is, however, another property which warrants most attention, because it seems, to me at least, the key to the explanation of nature's intrinsic value. It is the property of being naturally evolved or the property of naturalness" (Elliot, 1997: 59). Many of the properties Elliott mentions may be understood as aesthetic properties, and for him, "nature's aesthetic value is a basis for nature's intrinsic value because the aesthetic value in question arises independently of intentional design" (1997: 61). High aesthetic quality + wildness = intrinsic moral value. "The fact that nature's organizational complexity arises in the absence of intention and design itself contributes crucially to nature's aesthetic value. Moreover, this fact transforms the aesthetic value in question into the kind of aesthetic value that gives rise to moral value" (1997: 61). Just as we would not necessarily ascribe human rights to even the most lifelike cyborg but would certainly grant them to its builder, in Elliott's view a wild forest or desert has an intrinsic value that we are bound to respect, while a tree plantation or monocultural farm field does not.

Holmes Rolston affirms an objective intrinsic value for natural biological organisms. "Something more than [external] causes . . . is operating within every organism," he writes. Genetic information "gives the organism a *telos*, [an] end, a kind of (nonfelt) purpose" as "the genius of life is coded in genetic sets" (Rolston, 1988: 98). Organisms literally affirm their own intrinsic value by seeking to instantiate a certain way of being in the world. But for Rolston the fact that organisms pursue ends of their own is crucial to affirming their intrinsic value. It is the *telos* plus the "own-ness" that justifies the affirmation. Like Elliott, he makes a sharp distinction between organisms and artifacts. "The values that attach to machines are . . . entirely instrumental," Rolston writes, "derivative from the persons who have created these instruments. But the values that attach to organisms result from their nonderivative, genuine autonomy as spontaneous natural systems" (1988: 105). *Teloi* + wildness = intrinsic value.

Similarly Rolston (1988) finds intrinsic value in natural communities and wild ecosystems, basing this variously on their diversity, complexity, species richness, ecological integrity, or unique histories (chapter five). But it is the fact that these qualities have been generated or maintained by the places themselves rather than imposed on them by humans that lends them their full intrinsic value. This value is diminished or lost when people manage them for their own purposes. Once again wildness is an essential component of intrinsic value. "The sequoia and bison, the mountain community or the geyser basin [are] excellent achievements in spontaneous nature" (Rolston, 1989: 136).



The fact that people value diverse qualities in wild nature combined with the fact that wildness is threatened in a variety of ways complicates our management choices. For example, we may value both the species richness and the wild, unmanaged integrity of a national park that has gradually become encroached on by human settlements. Now we may have to decide whether to periodically supplement some wildlife populations in order to keep them from going locally extinct, or leave the park alone and allow it to lose some species richness. Similarly, we may have to choose whether to put out grain and periodically flood farm fields in a heavily managed agricultural landscape to help migrating waterfowl. Doing so would arguably keep more wildness on the local landscape and help preserve a globe-spanning natural phenomenon.

In such situations lovers of the wild can make a strong case for active management. This is a function of the kind of world humanity has created: one where wild nature is diminished in many ways and threatened at every turn. It would be perverse to take the existence of such hard choices as good evidence for tossing out wildness as a value-adding category altogether. This situation should instead encourage us to create a world where such choices are forced upon us less often (Hettinger and Throop, 1999).

For example: by preserving sufficiently large core wilderness areas and undeveloped migration corridors between them, we can facilitate the natural dispersal and intermixing of populations rather than having to artificially move species in perpetuity in order to keep them from going extinct. Such large-scale habitat preservation may not be possible in many places, but where it is still possible we should pursue it. It could become possible in more places if we slowly and humanely ratcheted back human numbers with their attendant economic demands (Foreman, 2011). Similarly, people might take serious steps to reduce our carbon emissions and limit global warming. That would allow us to avoid many intrusive (and likely ineffective) efforts to preserve species threatened by climate change, such as transferring them to new locations or temporarily preserving them in zoos or botanical gardens.

By better managing ourselves, we can leave more wild nature unmanaged or lightly managed. In contrast, dismissing the possibility or value of wild nature removes a powerful incentive to humility and interspecies justice (Staples and Cafaro, 2012). It paves the way for humanity to pave over the Earth.

#### 4 LETTING NATURE'S STORIES CONTINUE

John O'Neill, Alan Holland, and Andrew Light have developed an argument for the importance of narrative in environmental ethics with significant implications for how we value the wild. O'Neill et al. distinguish two ways people value the world around us: "end-state or outcome-based" approaches in which we value things "simply in virtue of their displaying some cluster of properties"; and "historical or process-based" approaches in which we value things "not merely as a cluster of properties but as particular individuals individuated by a temporal history and spatial location" (2008: 144-145). O'Neill et al. claim that many of the values people find in nature are of the latter kind. "History matters . . . in our evaluations of environments," they believe, while various management choices "receive their

justification through some sense of what is the appropriate continuation of the story of a place" (2008: 145-146).

I agree that historical narratives must play a role in our environmental ethics if we hope to do justice to the full range of values at stake in environmental decisions. Yet O'Neill et al. focus narrowly on the various meanings people project onto the landscape, forgetting that other species also have histories that matter. For example, they criticize descriptions of Yellowstone National Park as a wilderness because this allegedly overlooks the contributions Native Americans played in creating the landscape, ignoring the fact that legal wilderness designation best secures the continued existence and free ecological interactions of thousands of species for whom the park has been home for millennia. O'Neill et al. set up a false dichotomy by saying they favor "the historical perspective rather than an approach that advocates a return to nature" (2008: 160), overlooking the fact that history includes *natural* history. Their anthropocentric approach has room to appreciate the ecological role the Miwok Indians played by setting fires in the Yosemite Valley two hundred years ago, but not the ecological roles of Giant Sequoia trees, which evolved in the late Miocene Era six to ten million years ago and which have been helping set fires in the Yosemite region ten thousand times longer than people.

Environmental ethicists need to apply the narrative insight more broadly. We do need to respect the heritage and meanings people find "on the ground" in helping decide how the stories of different places should continue. But we can also appreciate the stories that other species have written onto the land (Monbiot, 2014). Those stories are good stories, often manifesting great beauty, complexity, and persistence. They deserve to continue, and at least in some places to continue free from human interference.

Natural species have intrinsic value in part because they are the products of unique journeys through deep evolutionary time. By nearly extinguishing the whooping crane North Americans have come perilously close to ending a journey that has lasted tens of millions of years. The details of the whoopers' physiology, life-ways, migrations, and ecological interconnections are interesting in themselves and mark these birds as well worth preserving. But the full meaning of what may be lost (or saved) only becomes clear when we remember that whooping cranes are unique in the stream of time. Nothing exactly like them will ever come again, and the same may be said for all the wild kinds that human beings threaten to extinguish.

Once again the narrative insight must be broadened: this time to encompass humanity's own role in the story of life on Earth. In *Homo sapiens* nature knows its own stories, perhaps for the first time. But rather than calling these stories "good," appreciating them and ensuring that they continue, we are on track to end many of them in the sixth mass extinction since complex life began some 650 million years ago. Paleontologists tell us that after past mass extinctions it has taken five million to twenty million years to recapture previous levels of diversity. So if we continue on our current path we will not see this lost biodiversity replaced in our lifetimes and quite likely no human beings will ever see it replaced. It is even possible that Earth's biodiversity might never fully recover if people sufficiently damage the resources necessary for life's regeneration. If this comes to pass our story will be one in which humanity defines itself either as a cancer on the biosphere, blindly growing in a way that destroys its host (Hern, 1999), or as a genocidal horde, extinguishing other species simply in order to create more room for itself (Gottlieb, 2009).

Thankfully there is a better way. With discipline and restraint we can allow nature's stories to continue, free from human domination in many places and graced by human understanding, appreciation, and gratitude. As Holmes Rolston notes: "Humans want a storied residence in nature where the passage of time integrates past, present, and future in a meaningful career. This does not make nature a mere instrument in a human story, any more than it makes the fellow persons in our drama merely tools. Rather, we have reached the richest possible concept of life in community, one in which all the actors contribute to storied residence" (1988: 351).

What does this mean in practice? At a minimum it means people should allow every natural species to continue to flourish in its native habitat, even if in reduced numbers, and allow some places to remain as wild as possible. To achieve these goals environmentalists need to redouble our traditional efforts to create new national parks, wildlife preserves, and wilderness areas (Noss, 2011), while working more broadly to replace our current cultures of extinction with societies that can live harmoniously with other species. That in turn means not just accepting but embracing limits to growth (Cafaro and Crist, 2012): both limits to human numbers and limits to human economic expansion. Nothing less will preserve wild nature in the long term, and in the long term that will be best for us, too. For as Henry Thoreau reminded his readers 160 years ago: "Our village life would stagnate if it were not for the unexplored forests and meadows which surround it. We need the tonic of wildness . . . We can never have enough of Nature" (1971: 317–318).

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